



Post-intervention gendered impacts and moderating factors of a government cash plus intervention for adolescents in Tanzania

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ABSTRACT

Introduction: Reducing poverty (including multidimensional poverty) and gender inequality can improve social development outcomes. Studies have sought to understand how poverty reduction and intersectoral programming targeted to adolescents can facilitate safe transitions to adulthood among adolescents. However, most intersectoral interventions for adolescents to date have been implemented by non-governmental actors with limited generalizability and potential for scale-up. In the current study, we examine 22-month post intervention impacts of the “plus components” of a cash plus intervention, Ujana Salama (Swahili for “Safe Youth”) targeted to adolescents ages 14–19 years (males and females) in households participating in a government social protection program in Tanzania. The government-implemented cash plus intervention, comprised of livelihoods and life skills training, a productive grant, mentoring, and linkages to adolescent-friendly health services, was implemented over 18 months in 2018 and 2019.

Methods: Using a cluster randomized controlled trial, we estimated post-intervention impacts in 2021 on the following domains: relationships, modern contraception, health seeking and HIV knowledge and risk, psychosocial outcomes and attitude, and violence. We further examined whether contextual factors, including gender norms and quality of health services, moderated these post-intervention impacts.

Results: Few impacts found at earlier rounds were still evident post-intervention. Exceptions include protective impacts on lifetime sexual violence risk among females and increases in sexual and reproductive health services utilization among males. Moreover, newly detected adverse impacts on mental health contrasted with earlier protective impacts.

Conclusion: While external factors such as lengthy delays of cash transfer payments to adolescents’ households and the COVID-19 pandemic may have mitigated the potential for sustained impacts of this intervention, findings suggest that future programs may need to provide different combinations of programming, provide support longer-term, or intervene at more levels of the social ecological model to influence many of the outcomes examined and to effect more lasting change.

1. Introduction

Adolescence is a period of rapid biological, cognitive, and social development (Balvin & Banati, 2017; Blakemore & Choudhury, 2006),

and it is a time when social and gender roles begin to shift (John et al., 2017; Sugarman, 2004). There are many threats to safe, healthy, and productive transitions to adulthood during this critical development period. These include structural drivers such as poverty and gender

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inequality, which are inextricably linked in the labor market, reproduction, and the care economy (Folbre, 1994; Holmes & Jones, 2013). In Africa, these threats can also include barriers to educational attainment, lack of adequate employment opportunities, lack of access to quality healthcare, gender-based violence, early pregnancy and marriage, limited decision-making power related to sexuality and reproductive health, and heightened risk of HIV and other sexually transmitted infections (Decker et al., 2015; Holmes & Jones, 2013; Patton et al., 2012; UNAIDS, 2019; UNICEF, 2014). For example, in the region one in three girls marries before age 18 (the highest rate in the world) (UNICEF, 2023). Moreover, 77 percent of adolescent girls and young women globally who acquired HIV in 2023 were in sub-Saharan Africa, where 160,000 new infections of HIV occurred in women and girls 15–24 years (UNAIDS, 2024). The region also has the highest rates of children being out of school globally, and at all levels in Africa girls are more likely to be out of school than boys (for example, 16.3 percent of boys v. 21.4 percent of girls in primary school and 35.3 of boys v. 38.1 percent of girls in secondary school). East Africa also has high rates of non-partner sexual violence (11.4 percent among women aged 15 years and above) (Abrahams et al., 2014), and Eastern and Southern Africa combined have high rates of intimate partner physical or sexual violence among girls and young women 15–24 years (34.38 percent v. 28.47 percent globally) (Decker et al., 2015).

Reducing poverty and gender inequality can improve social development outcomes, including women's and girls' assets, capabilities, and agency (Holmes & Jones, 2013). As such, studies have sought to understand how poverty reduction programming can facilitate safe transitions to adulthood.

One review of 85 publications examining effects of government, non-contributory social protection programs on adolescent well-being in lower- and middle-income countries (LMICs) found that these programs had protective effects on school attendance, reducing adolescent labor, reducing sexual exploitation, and delaying sexual debut (Cirillo et al., 2021). They also found limited protective effects on food security and mental health, but very few studies examined these outcomes. Another systematic review of 45 studies examining the impacts of cash transfers on HIV infection, STIs, or sexual behaviors among adolescents and adults combined found that a majority of studies examining sexual debut found that cash transfers delay sexual debut (Stoner et al., 2021). For other outcomes, including number of sexual partners, condom use, unprotected sex, and transactional sex, only a minority of studies found protective impacts. Among studies reporting differences by sex, protective impacts were larger among women than men. Turning to mental health, two studies have performed systematic reviews and meta-analyses on cash transfers among children and youth. One review of 14 studies among youth under 20 years in LMICs, and their meta-analysis found a small, protective effect on mental health outcomes, including internalizing (e.g., mood related) and externalizing (e.g., behavioral related) symptoms (Zaneva et al., 2022). Another review of 12 studies among children and youth 0–24 years in LMICs, in contrast, found no significant overall effects on depression outcomes among youth in a meta-analysis (Zimmerman et al., 2021). Finally, a review examining impacts of social safety nets in LMICs on violence among children and adolescents reviewed 11 studies, including 57 violence outcomes and found that 19% (and a higher proportion (40%) of sexual violence impacts) of impacts were protective, and there were no adverse effects (Peterman et al., 2017).

While these studies show promising potential, a recognition that cash alone cannot address all barriers to safe and healthy transitions to adulthood has led to the promotion of multisectoral interventions. These interventions aim to simultaneously address several areas of deprivation and are sometimes referred to as “cash plus” programmes, defined as cash transfers combined with complementary support or linkages to services provided by other sectors (Roelen et al., 2017), multifaceted programs, or bundled interventions (Bandiera et al., 2019; Rogers et al., 2024).

A systematic review of bundled interventions for adolescents and youth aged 10–24 years in Africa reviewed 58 studies (43 quantitative and 15 qualitative) across 26 unique interventions (Rogers et al., 2024). Based on findings from quantitative studies reviewed, interventions were most successful (in more than 50 percent of studies) at improving economic outcomes; mental health and psychosocial outcomes; sexual and reproductive health knowledge and services utilization; and HIV prevention knowledge and testing. Interventions reviewed found protective effects in fewer than 50 percent of studies in the following domains: HIV and STI incidence; gender-based violence; gender attitudes; education; sexual risk behaviors; and sexual debut. However, qualitative studies reviewed suggested that effects were protective against sexual risk behaviors (despite more mixed evidence among quantitative studies). Bundled interventions were less successful in improving 1) distal outcomes and 2) relational outcomes (for example, HIV and STI incidence, sexual risk behaviors, and gender-based violence). The latter have complex determinants, where gendered power disparities are at play at multiple levels, and thus it may be difficult for interventions targeted at the individual-level to effect change (Rogers et al., 2024). Additionally, many impacts are measured in a relatively short period of time (usually 12–24 months post-rollout). Some impacts may take longer to materialize, and this short time frame does not provide any information about the sustainability of impacts beyond the intervention period.

Given the relevance of sustainable post-intervention impacts to the current study, we further summarize findings from seven bundled interventions (covered in the Rogers et al. (2024) review) that were evaluated at least a year after the programs ended (post-intervention). All were targeted to females (adolescents or young women), and interventions combining a mixture of vouchers for health services, mentoring, safe spaces, life skills and health information trainings, courses on income-generating activities, cash transfers for schooling, financial education and savings accounts, caregiver incentives, family-targeted workshops, and psychosocial support were implemented in Kenya, Liberia, South Africa, Uganda, and Zambia. Six out of seven studies were implemented by non-governmental organizations or researchers, while one had a mix of public and private implementation (Austrian et al., 2020). The interventions found sustained, post-intervention impacts on self-efficacy, contraception and fertility knowledge, probability of having savings, and reduced engagement in transactional sex (Austrian et al., 2020); delays in marriage and pregnancy, and reductions in fertility (Austrian et al., 2022); delays in sexual debut and increased educational, health and wealth outcomes (Kangwana et al., 2022); increases in a gender attitudes index, life skills index, financial literacy, knowledge of condom effectiveness, and a sexual and reproductive health index (Özler et al., 2020); increases in education plans and confidence in these plans (Curley et al., 2016); reductions in depressive symptoms (Kivumbi et al., 2019); increases in employment (Naledi et al., 2022); increased engagement in income-generating activities, condom use, and control over their body (Bandiera et al., 2019) (more details in Online Appendix 1).

In the current study, we examine 22-month post-intervention impacts of the “plus” components in a cash plus intervention, namely the Ujana Salama (“Safe Youth” in Swahili) cash plus intervention targeted to adolescents ages 14–19 years living in extremely food insecure households receiving a government social protection program in Tanzania. This study is referred to as a cash plus intervention because the adolescent-targeted components (Ujana Salama) were layered onto a government-implemented, large-scale social assistance program (the Productive Social Safety Net (PSSN), described in more detail below) which includes a major cash transfer component. The government-implemented Ujana Salama intervention, comprised of livelihoods and life skills training, a productive grant, mentoring, and linkages to adolescent-friendly health services, was implemented over an 18-month period between 2018 and 2019, and we estimate post-intervention impacts in 2021 to understand longer term impacts which may take more

time to materialize as well as sustainability of impacts observed at rounds 2 (2018) and 3 (2019). We further examine whether contextual factors moderated these post-intervention impacts. The PSSN program continued in both treatment and control communities after Ujana Salama ended; PSSN Phase 1 ran from 2015 to 2019, while Phase 2 ran from 2020 to 2025. However, there was an 18-month payment delay between 2019 and 2020 during the transition between phases (Zuilkowski et al., 2020).

Impacts of the Ujana Salama intervention were previously measured at two follow-up rounds [in 2018 (Round 2), just after trainings, and again in 2019 (Round 3), just after delivery of the productive grants]. At Round 2, the intervention increased participation in economic activities and livestock tending, gender-equitable attitudes (driven by males), HIV knowledge (larger impacts for females), knowledge of where to obtain condoms and modern contraceptive methods, and knowledge of modern contraceptive methods (Chzhen et al., 2021; Tanzania Cash Plus Evaluation Team, 2020). There were no impacts on self-esteem, locus of control, perceived social support, depressive symptoms, risky sexual behaviors, or violence experiences at Round 2. Subsequently, at Round 3, the intervention increased the probability that youth had started a business, owned assets for a business, kept records for a business, participation (and hours) in livestock tending, entrepreneurial attitudes, self-esteem, gender equitable attitudes (driven by males) and reduced depressive symptoms, experiences of sexual violence among females, and perpetration of emotional and physical violence by males (Palermo et al., 2021; Principe et al., 2022; Tanzania Cash Plus Evaluation Team, 2021; Waidler et al., 2022). However, the intervention did lower the age of sexual debut among girls (Waidler et al., 2022). The intervention had no effects on overall participation (and hours) in household chores, self-perceived stress, social support, sexual risk behaviors, and marriage and pregnancy (Tanzania Cash Plus Evaluation Team, 2021). In terms of economic outcomes, the intervention increased entrepreneurial attitudes, probability of running a business, participation in economic activities, and livestock tending (Tanzania Cash Plus Evaluation Team, 2024).

The current study fills several gaps. First, it adds to the scarce evidence base on post-intervention effects of bundled interventions for adolescents. Second, it examines impacts among both males and females; all studies examining post-intervention effects of bundled interventions in the aforementioned review were among female-only samples. Third, we examine moderating effects of gender norms and quality of health services, which none of the other studies reviewed have done. Finally, the intervention evaluated here was implemented within government structures, which conveys high external validity and potential for further scale-up.

2. Materials and methods

2.1. Productive Social Safety Net (PSSN)

Ujana Salama was implemented through the PSSN, which is a large-scale social assistance program implemented by the Tanzania Social Action Fund (TASAF), a government agency. The PSSN is a household-targeted program. As of 2024, it covered more than five million individuals in 1.3 households and is comprised of bi-monthly (every other month) cash transfers, a public works component, and livelihood enhancement activities. The value of cash transfers varies across households, depending on household composition, participation in public works, and compliance with co-responsibilities (average payment per cycle is 31,844 TZS per household, or approximately 12.25 USD, for the conditional cash transfer component excluding public works), and is directed to a designated recipient (generally an adult woman in each household).

2.2. Intervention

Informed by operational learnings from the PSSN I (for example, a high proportion of adolescents of school age were found to have already dropped out of school prior to program rollout) during a period when TASAF was still developing its livelihood enhancement strategy, Ujana Salama was developed as a pilot in 2016 and 2017 and implemented between 2018 and 2019. Further adaptation and scale-up occurred started in 2021 [in study control areas and two additional regions (Songwe and Kigoma)]. In the current study we report findings from the pilot phase (2018–2019), which was rigorously evaluated with a cluster RCT.

Ujana Salama was targeted to adolescents aged 14–19 years at baseline living in households receiving the PSSN (in 2018). The intervention ran from January 2018 to March 2019 and included a 12-week training on livelihoods and life skills (including gender and sexual and reproductive health; Timeline provided in Online Appendix 2 and curriculum topics provided in Online Appendix 3), nine months of mentoring (July 2018 to March 2019), disbursement of productive grant directly to adolescents (equivalent to 80 USD, to match the amount given to households for livelihood activities through the PSSN) to start a business or continue in education (disbursed in April and July 2019), and linkages to adolescent friendly government health services (January 2018 to July 2019). Training sessions and mentoring were provided by community-based mentors on livelihood options and life concerns, including referral for education, vocational training, savings groups, and productive grants. Adolescent-friendly services refresher trainings were implemented in government-run primary healthcare facilities in study areas (in July 2018) by the Ministry of Health, with technical assistance from UNICEF.

2.3. Conceptual framework

Ujana Salama's Conceptual Framework (Online Appendix 4) illustrates how four areas of support (cash transfers, livelihoods enhancement, life skills/sexual and reproductive health education, and youth friendly services) can improve adolescents' assets including economic capital, educational capital, social capital, and health capital, and subsequently improve intermediate, and then longer-term outcomes.

2.4. Study design

Ujana Salama was evaluated with a longitudinal cluster randomized controlled trial (cRCT) implemented between April 2017 and March 2021 by UNICEF Innocenti, EDI Global, and University at Buffalo, in collaboration with UNICEF and TASAF. The evaluation included 130 villages from two TASAF administrative areas in the Iringa and Mbeya regions of mainland Tanzania (corresponding to the districts/councils of Busokelo and Rungwe in Mbeya and Mafinga and Mufindi in Iringa), which were randomized evenly (1:1) into treatment ($n = 65$) and control ($n = 65$) arms, stratified by region and village size (number of eligible participants < sample median vs. \geq sample median). The treatment arm received the PSSN and Ujana Salama, while the control arm received only the PSSN (which includes bi-monthly cash transfers to households). The study does not include a "no-cash" arm. Thus, we only estimate impacts of cash plus compared to cash only and not impacts of cash plus versus no cash.

Adolescents aged 14–19 years who lived in PSSN-beneficiary households at baseline were invited to participate in Ujana Salama in treatment communities, and the study team aimed to interview all eligible adolescents in treatment and control villages in baseline surveys. Impact estimates reported in the current study reflect post-intervention impacts among 2053 (1064 control and 989 treatment) youth comprising the panel sample who were interviewed at both baseline (April–June 2017) and Round 4 (January–March 2021). Round 4 surveys were implemented 46–48 months after baseline and 21–22

months post-intervention.

Four types of quantitative interviews were implemented at each round: household, adolescent, community (with village leaders), and health facility.

Survey instruments were translated to Swahili and pilot tested prior to fieldwork implementation. Informed consent was obtained from adult participants (aged ≥ 18 years) and married youth regardless of age [who are considered to be acting in an adult capacity Tanzania, where 29 percent of women currently aged 20–24 years were married before age 18 (Ministry of Health (Dodoma) et al., 2022)]. For minors, informed assent was obtained and informed consent was obtained from their guardians.

For the violence modules, a split sample approach (with random allocation at the village level) for males and females was used based on best practices, to reduce the likelihood that perpetrators and victims in the same community would both be interviewed (UNICEF Tanzania et al., 2011). We also provided anonymized referral information to survey respondents, following WHO guidelines for research on violence (World Health Organization, 2005).

The study was retrospectively registered with the Pan African Clinical Trial Registry (PACTR) as PACTR201804003008116. Ethical review clearance was obtained from the National Institute for Medical Research (NIMR) in Tanzania (NIMR/HQ/R.8c/Vol. I/1763), and research clearances were obtained from the Tanzania Commission for Science and Technology (COSTECH).

2.5. Measures

We estimated impacts on the following domains (indicators): relationships (relationship status/ever married, sexual debut, pregnancy, age at sexual debut, first sex forced); modern contraception (knowledge of methods, use); health seeking and HIV (sought reproductive health services, HIV testing, HIV knowledge, HIV risk perception); violence (experiences, perpetration); and psychosocial outcomes and attitudes (depressive symptoms, stress, gender equitable attitudes). Additionally, we examined whether gender norms and health service availability and readiness moderated program impacts. Gender norms were measured from community surveys (among a small number of community leaders in each community); these differ from gender equitable attitudes, measured among adolescents and considered among the main outcomes examined in this study. While individual gender attitudes generally reflect community gender norms (Kågesten et al., 2016), and are shaped by a perception of what is and is not acceptable in one's community (Rogers et al., 2023), the relationship between the two is complex. Health service readiness was assessed using the Service Availability and Readiness Assessment (SARA) guidelines as a framework (World Health Organization, 2015). Choice of these moderators was informed by the gender-responsive and age-sensitive (GRASP) conceptual framework for social protection, which highlights how gender norms are structural drivers of vulnerabilities and can moderate program impacts (Banati et al., 2020); as well as prior research which shows that health system barriers (e.g., difficulty accessing services, poor provider attitudes, issues around confidentiality, and insufficient adolescent-friendly services) can impede adolescents' use of health services (Kidman et al., 2020; World Health Organization, 2013). A detailed description of the creation of each of the indicators is provided in Online Appendices 5 and 6. Post-intervention impacts on economic activities, self-efficacy, entrepreneurial attitudes, and self-esteem have been estimated elsewhere (Palermo et al., 2024).

2.6. Power and statistical analysis

Sample size calculations were based on the primary outcomes: pregnancy, transactional sex, first sex forced, physical violence, and violence reporting. Assuming intracluster correlations (ICC) of 0–0.14, it was estimated that 65 clusters with 9–18 adolescents per cluster would

be required for a minimum detectable effect size of 5 percentage point change for binary outcomes with a power of 0.80 (two-tailed $P < 0.05$).

The sub-sample for analysis is adolescents and youth interviewed at baseline and Round 4 (the panel). We first assessed baseline balance of outcome indicators using ordinary least squares (OLS) regressions, where the dependent variable was the outcome of interest and controls included a treatment indicator and fixed effects for region and village size.

Treatment impacts were estimated using two strategies. For outcomes measured at both rounds, we estimated impacts using analysis of covariance (ANCOVA). ANCOVA controls for the baseline value of the outcome and is a more efficient estimation strategy as compared to difference-in-differences when the outcomes of interest are not strongly autocorrelated (McKenzie, 2012). For outcomes not measured at baseline (sexual violence, perpetration of violence) or for those only occurring once (sexual debut), we estimated impacts using single difference models.

The ANCOVA model is specified as follows:

$$Y_{1ij} = \alpha_0 + \alpha_1 T_j + \alpha_2 Y_{0ij} + \alpha_3 X_{ij} + \varepsilon_{ij} \quad (2)$$

where Y_{1ij} is the Round 4 value of the considered outcome for adolescent i living in community j . T_j is a binary indicator equal to one if the youth lived in a treatment community and = 0 otherwise. Y_{0ij} is the baseline value of the outcome, while X_{ij} is a vector of controls including gender, age at baseline, and district \times size fixed effects. Finally, ε_{ij} is the error term. The estimated coefficient of interest is $\hat{\alpha}_1$, which measures the impact of the Cash Plus program on the outcome. In equation (1), the variable T_j is equal to one for all youth living in a treatment village, even if an adolescent did not actually attend the Cash Plus training. Hence, this equation estimates intent-to-treat (ITT) impacts. Given a take-up rate of approximately 50 per cent, ITT findings in this paper show the generalizable impact that one may expect were the program to be scaled up to the entire target population, where it would not be expected that take-up rates would be close to 100%. We ran these ITT analyses pooled and then stratified by sex. However, to show impacts among those participating, we also estimate average treatment effects on the treated (ATT) among the pooled samples. ATT estimates are shown in the tables, but estimates described in the text in the Results section refer to ITT estimates. In all our regressions, standard errors were adjusted for clustering at the village level. All analyses were run using Stata version 18.0 (College Station, TX).

To test how contextual factors moderate program impacts, we added the following terms to the equation: the moderator (e.g. progressive norms or high health facility quality) and an interaction term (interacting the treatment variable with the moderating variable). We disaggregate by sex when looking at quality of health facilities but ran only pooled regressions when analyzing gender norms. Effects in conservative villages, or villages with lower quality services, are given by the coefficient on the treatment indicator, while the effects in progressive/high quality services villages are obtained by adding the treatment coefficient and the interaction term coefficient.

Finally, for eight key indicators (a sub-set of all indicators examined), we implemented Bonferroni's correction for multiple hypothesis testing. We did not implement Bonferroni's correction for all outcomes examined because the study was powered at an alpha level of 0.05 and not with Bonferroni's correction (which requires significance at $p < 0.006$ for eight outcomes) in mind. Thus, Bonferroni correction findings should be interpreted with caution.

3. Results

3.1. Sample characteristics, take-up, and attrition

Of 2458 adolescents interviewed at baseline, 2053 were re-interviewed at Round 4 (84%; Fig. 1). This rate of attrition is similar

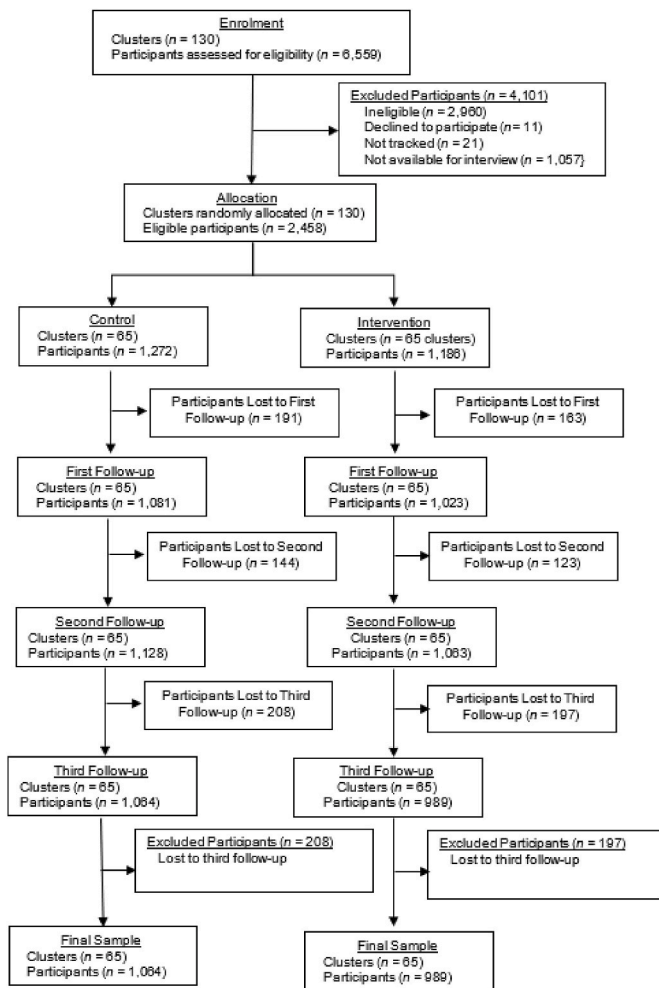


Fig. 1. Trial profile.

to that found in other longitudinal studies among adolescents in East Africa (Austrian et al., 2021; Bandiera et al., 2019). At Round 4, youth were, on average, 20 years old (45% females). As reported elsewhere (Tanzania Cash Plus Evaluation Team, 2020, 2021, 2024), and supported by Online Appendix 7, we did not find evidence of differential attrition by treatment status.

Out of 17 outcome indicators, there were significant differences between treatment and control groups for only three indicators at baseline when we tested for balance: “single/never married” (both among the full sample and the panel sample), used condom at last sex, and experienced physical violence (Online Appendix 7). This suggests the study has good internal validity (since most indicators were balanced at baseline).

Approximately 49 percent of eligible adolescents took up the intervention (defined as participation in any training session; Online Appendix 8). Participation rates were higher among females (54 percent) than males (45 percent). Among those who attended trainings, about 50 percent met with a mentor afterwards. About 65 per cent (33.6 percent of total youth living in treatment villages) of those who attended training submitted an education or business plan (required to receive the productive grant). A majority of those who submitted a plan (76 percent) chose a business plan over a schooling or vocational training plan.

3.2. Post-intervention impacts

There were no impacts on sexual debut, age of sexual debut, or forced

first sex at Round 4 (Table 1), and this is consistent with findings from previous rounds in the pooled sample Tanzania Cash Plus Evaluation Team (2020); (Tanzania Cash Plus Evaluation Team, 2021). At Round 4 (but not at any previous rounds), we did observe a decrease in the probability (5.4 percentage points) that treatment youth currently have a girlfriend or boyfriend, and, when examined by sex, we see that this effect was driven by the male sample, who were 5.1 percentage points more likely to be married or cohabiting (and 7.1 percentage points less likely to have a girlfriend; Table 2). This was a sustained (albeit larger) impact from Round 3, when treatment males were 2.7 percentage points more likely to have been married or cohabiting (Tanzania Cash Plus Evaluation Team, 2021). At Round 4, males were also 4.8 percentage points more likely to have gotten a female pregnant as a result of the intervention (Table 2). There were no significant impacts on pregnancy among females, nor on the pooled or disaggregated samples at previous waves.

Knowledge of modern contraceptive methods was very high at Round 4 (96–97 percent; Table 3), increasing approximately 20 percentage points over baseline. Both at Rounds 2 and 3 we observed increased knowledge of contraceptives as a result of the intervention (Tanzania Cash Plus Evaluation Team, 2020, 2021). However, by Round 4, there were no impacts. Moreover, there were no impacts (at any round) on use of contraceptive methods (Tables 3 and 4).

Despite positive impacts on HIV knowledge at Rounds 2 and 3 (Tanzania Cash Plus Evaluation Team, 2020; Waidler et al., 2022), differences in HIV knowledge between study arms were no longer observed at Round 4 (Tables 5 and 6). However, the intervention did increase the likelihood that adolescents perceived their HIV risk to be none by 5.6

Table 1
Cash Plus Impacts on relationships, first sex indicators and fertility.

	ITT Impact	ATT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	(1)	(2)	(3)	(4)	(5)
Ever had spouse/ cohabiting partner	0.044 (0.02)	0.115 (0.06)	0.011	0.140	0.165
N	2053	2052	2052	1064	989
Has a girlfriend or boyfriend	−0.054* (0.02)	−0.141* (0.06)	0.173	0.392	0.338
N	2053	2052	2052	1064	989
Ever had sex	−0.010 (0.03)	−0.028 (0.08)		0.487	0.465
N	1707	1707		879	828
Age at first sexual intercourse	−0.166 (0.12)	−0.423 (0.31)		17.979	17.794
N	812	812		428	384
First sex forced/ pressured/ tricked - among sexually debuted	−0.009 (0.02)	−0.023 (0.04)		0.077	0.065
N	812	812		428	384
Ever pregnant	−0.013 (0.04)	−0.029 (0.08)		0.400	0.394
N	824	824		448	376
Currently pregnant	−0.010 (0.02)	−0.022 (0.04)		0.065	0.058
N	793	793		428	365
Males: ever got female pregnant	0.048* (0.02)	0.163* (0.07)		0.049	0.092
N	1117	1116		551	566

Notes: Linear models were estimated on the panel of youth interviewed both at baseline and Round 4. Regressions control for gender, age and outcome value at baseline (when available), district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. *p < 0.05, **p < 0.01.

Table 2

Cash Plus Impacts on relationships, first sex indicators and fertility, by sex.

	Females		Males		ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ever had spouse/cohabiting partner	0.032 (0.03)	0.020	0.244	0.266	0.051* (0.02)	0.004	0.045	0.090
Has a girlfriend or boyfriend	−0.032 (0.04)	0.263	0.342	0.311	−0.071* (0.03)	0.099	0.438	0.357
N	930	930	509	421	1123	1123	555	568
Ever had sex	−0.001 (0.04)		0.534	0.545	−0.020 (0.03)		0.448	0.411
N	735		399	336	972		480	492
Age at first sexual intercourse	−0.001 (0.12)		17.869	17.962	−0.339 (0.20)		18.088	17.642
N	396		213	183	416		215	201
First sex forced/pressured/tricked	−0.006 (0.03)		0.146	0.132	−0.004 (0.01)		0.009	0.005
N	395		213	182	417		215	202

Notes: Linear models were estimated on the separate subsamples of female and male youth interviewed both at baseline and Round 3. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. *p < 0.05, **p < 0.01.

Table 3

Cash Plus Impacts on contraceptive knowledge and use.

	ITT Impact	ATT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	Impact	Impact	Mean	Mean	Mean
	(1)	(2)	(3)	(4)	(5)
Has knowledge about modern contraceptives	−0.009 (0.01)	−0.027 (0.02)	0.777	0.972	0.959
N	2026	2025	2025	1051	975
Last sex: used condom	−0.053 (0.03)	−0.136 (0.09)		0.461	0.419
N	1132	1131		597	535
Currently using modern contraceptive - among sexually debuted	−0.038 (0.03)	−0.097 (0.09)		0.653	0.617
N	1132	1131		597	535

Notes: Linear models were estimated on the panel of youth interviewed both at baseline and Round 4. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. *p < 0.05, **p < 0.01.

Table 4

Cash Plus Impacts on contraceptive knowledge and use, by sex.

	Females				Males			
	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has knowledge about contraceptives	−0.004 (0.01)	0.747	0.988	0.985	−0.010 (0.01)	0.801	0.958	0.940
Last sex: used condom	−0.046 (0.04)		0.307	0.263	−0.066 (0.05)		0.637	0.572
N	585		319	266	547		278	269
Currently using contraceptive - among sexually debuted	−0.061 (0.04)		0.624	0.560	−0.014 (0.05)		0.687	0.673
N	585		319	266	547		278	269

Notes: Linear models were estimated on the separate subsamples of female and male youth interviewed both at baseline and Round 3. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. *p < 0.05, **p < 0.01.

percentage points at Round 4. This was a newly emerging impact at Round 4, as there were no impacts on perceived HIV risk at previous rounds.

Table 5

Cash Plus Impacts on health seeking, HIV knowledge and HIV risk.

	ITT Impact	ATT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	Impact	Impact	Mean	Mean	Mean
	(1)	(2)	(3)	(4)	(5)
HIV knowledge	−0.022 (0.03)	−0.057 (0.09)		0.452	0.427
Perceived HIV risk: none	0.056* (0.02)	0.151* (0.07)	0.839	0.719	0.781
N	1998	1997	1997	1037	961
Tested for HIV: Lifetime	0.027 (0.02)	0.070 (0.06)	0.441	0.725	0.742
N	2043	2042	2042	1057	986
Visited health facility	0.043 (0.03)	0.116 (0.07)	0.132	0.312	0.334
N	2053	2052	2052	1064	989

Notes: Linear models were estimated on the panel of youth interviewed both at baseline and Round 4. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. *p < 0.05, **p < 0.01.

Table 6

Cash Plus Impacts on health seeking, HIV knowledge and HIV risk, by sex.

	Females				Males			
	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HIV knowledge	−0.068 (0.04)		0.519	0.458	0.011 (0.04)		0.391	0.403
Perceived HIV risk: none	0.067 (0.04)	0.868	0.685	0.751	0.049 (0.03)	0.816	0.751	0.804
N	907	907	498	409	1091	1091	539	552
Tested for HIV: Lifetime	0.028 (0.03)	0.457	0.804	0.835	0.023 (0.03)	0.428	0.652	0.674
N	925	925	506	419	1118	1118	551	567
Visited health facility	0.025 (0.04)	0.210	0.513	0.544	0.053* (0.03)	0.068	0.128	0.178
N	930	930	509	421	1123	1123	555	568

Notes: Linear models were estimated on the separate subsamples of female and male youth interviewed both at baseline and Round 3. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

Turning to health services utilization, in the pooled sample, we find no impacts on visits to a health facility for SRH reasons (Table 5) but, as in the previous round (Tanzania Cash Plus Evaluation Team, 2021), when disaggregated by sex, we find the intervention increased males' use of health services for SRH reasons by 5.3 percentage points (Table 6).

Rates of both emotional and physical violence experienced in the previous 12 months dropped between baseline and Round 4 for both groups (from 35 percent to 26 to 27 percent), and we did not find any impacts on these outcomes (Tables 7 and 8), consistent with findings from previous rounds (Palermo et al., 2021; Tanzania Cash Plus Evaluation Team, 2020). However, we find protective impacts on sexual violence experienced by females, who are 7.2 percentage points less likely to have experienced lifetime sexual violence as a result of the intervention (there were no impacts on 12-month experiences of sexual violence among females, or on either indicator among the pooled and male samples). These findings are consistent with those from Round 3, when the intervention had reduced 12-month experiences of sexual violence in the pooled and female (but not male) samples (Palermo

et al., 2021). There were no impacts on perpetration of emotional or physical violence among any of the samples at Round 4, despite reductions found at Round 3 among males (Palermo et al., 2021).

Rates of depressive symptoms increased in the treatment group (from 29 to 34 percent between baseline and Round 4) but decreased slightly in the control group (27 percent at Round 4). Despite reductions in depressive symptoms among youth in the treatment arm found at Round 3 (Prencipe et al., 2022), the intervention increased the likelihood that youth reported depressive symptoms at Round 4 (Table 9). There were no impacts on self-perceived stress (ELDI) at any round, nor on depressive symptoms at Round 2.

At Rounds 2 and 3, the intervention increased gender equitable attitudes, with results driven by males (Chzhen et al., 2021; Tanzania Cash Plus Evaluation Team, 2021), but there were no impacts at Round 4 (Table 9), nor were there differences by sex at Round 4 (Table 10). However, we do find more equitable attitudes among both study arms at Round 4 (Table 9; 14.2 and 14.1, among treatment and control, respectively) as compared to baseline (12.6).

Estimates where we find significant moderating effects of quality of health facilities and gender norms are reported in Fig. 2 through 4. For outcomes and sub-samples where we find no moderating effects, estimates are not reported here. Quality of health facilities had a moderating effect on intervention impacts with respect to visits to health facilities. The intervention increased the likelihood of visiting a health facility in the past 12 months by 13 percentage points among females (but not males) living in villages with low quality health facilities (Fig. 2). In villages with high quality health facilities, there were no impacts. The intervention also increased HIV testing among females in villages with low quality facilities (by 10 percentage points), but in villages with high quality health facilities there were no impacts (Fig. 3).

We further found that conservative norms had negative moderating effects on contraceptive use. In villages with conservative norms, the intervention reduced contraceptive use by 13 percentage points, while in progressive villages the intervention had no impacts (Fig. 4). However, norms did not moderate impacts on contraceptive knowledge or pregnancy.

When implementing Bonferroni's correction for multiple hypothesis of key indicators, none of the impacts remained significant (Online Appendix 9).

4. Discussion

This study examined 22-months post intervention impacts of a cash plus intervention targeted to male and female adolescents living in households participating in a government cash transfer program in

Table 7

Cash Plus Impacts on violence.

	ITT Impact	ATT Impact	Baseline Mean	Round 4 Cash Only	Round 4 Cash Plus
	(1)	(2)	(3)	Mean	Mean
	(1)	(2)	(3)	(4)	(5)
Experienced emotional abuse	0.007 (0.03)	0.018 (0.08)	0.349	0.268	0.264
Experienced physical violence	0.007 (0.02)	0.018 (0.06)	0.259	0.119	0.126
N	976	976	976	514	462
Experienced sexual violence – lifetime	−0.028 (0.02)	−0.069 (0.04)		0.086	0.056
Perpetrated emotional abuse	−0.003 (0.02)	−0.008 (0.05)		0.078	0.073
Perpetrated physical violence	−0.012 (0.02)	−0.030 (0.04)		0.051	0.039
N	977	977		514	463

Notes: Linear models were estimated on the panel of youth interviewed both at baseline and Round 4. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

Table 8

Cash Plus Impacts on violence, by sex.

	Females		Males		ITT Impact	Males		Round 4 Cash Plus Mean
	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean		Baseline Mean	Round 4 Cash Only Mean	
	(1)	(2)	(3)	(4)		(6)	(7)	(8)
Experienced emotional abuse	−0.005 (0.04)	0.384	0.307	0.300	0.026 (0.04)	0.317	0.231	0.230
Experienced physical violence	0.024 (0.04)	0.239	0.106	0.148	−0.014 (0.03)	0.279	0.131	0.105
N	477	477	254	223	499	499	260	239
Experienced sexual violence - lifetime	−0.072* (0.03)		0.169	0.112	0.000 (0.01)		0.004	0.004
Perpetrated emotional abuse	−0.023 (0.03)		0.114	0.103	0.007 (0.01)		0.042	0.046
Perpetrated physical violence	−0.027 (0.03)		0.055	0.040	−0.006 (0.02)		0.046	0.037
N	477		254	223	500		260	240

Notes: Linear models were estimated on the separate subsamples of female and male youth interviewed both at baseline and Round 3. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

Table 9

Cash Plus Impacts on mental health and gender equitable attitudes.

	ITT Impact	ATT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	(1)	(2)	(3)	(4)	(5)
Reports depressive symptoms (CES-D10 ≥ 10)	0.064* (0.03)	0.169* (0.08)	0.289	0.269	0.338
ELDI (0–39)	0.284 (0.24)	0.745 (0.63)	3.481	3.870	4.063
N	2053	2052	2052	1064	989
GEM (0–24)	−0.116 (0.38)	−0.310 (1.01)	12.560	14.151	14.098
N	2053	2052	2052	1064	989

Notes: Linear models were estimated on the panel of youth interviewed both at baseline and Round 4. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

Tanzania. We found limited post-intervention impacts. Protective impacts were found on sexual violence risk among females and SRH health seeking among males. In addition, we found two new impacts emerging that were not detected at previous rounds, including reduced self-perceived HIV risk, increases in marriage and pregnancy (of their

partners) among males, and adverse effects on depressive symptoms (impacts on mental health estimated at Round 3 were protective). Finally, impacts on HIV testing, violence perpetration, gender equitable attitudes, contraceptive knowledge, and HIV prevention knowledge found at earlier rounds were not sustained. Our findings contribute to the existing understanding of multisectoral interventions for adolescents

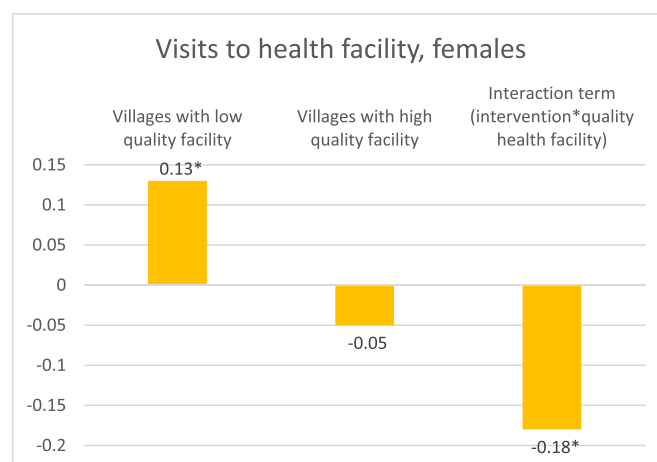


Fig. 2. Moderating effects of quality of health facilities on visits to health facilities, females.

Table 10

Cash Plus Impacts on mental health and gender equitable attitudes, by sex.

	Females				Males			
	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean	ITT Impact	Baseline Mean	Round 4 Cash Only Mean	Round 4 Cash Plus Mean
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depressive symptoms (CES-D10 ≥ 10)	0.066 (0.03)	0.268	0.210	0.276	0.062 (0.04)	0.306	0.323	0.384
ELDI (0–39)	0.293 (0.42)	4.037	4.609	4.967	0.253 (0.28)	3.020	3.193	3.393
N	930	930	509	421	1123	1123	555	568
GEM (0–24)	−0.500 (0.39)	11.746	13.337	12.771	0.222 (0.55)	13.233	14.898	15.081
N	930	930	509	421	1123	1123	555	568

Notes: Linear models were estimated on the separate subsamples of female and male youth interviewed both at baseline and Round 3. Regressions control for gender, age and outcome value at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

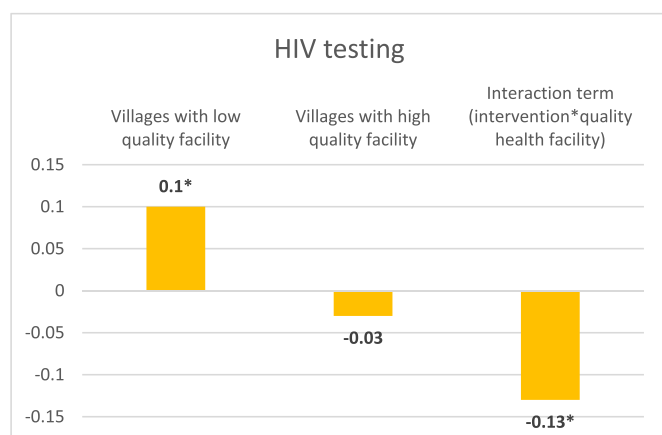


Fig. 3. Moderating effects of quality of health facilities on HIV testing, males and females. Note: Regressions control for gender, age at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

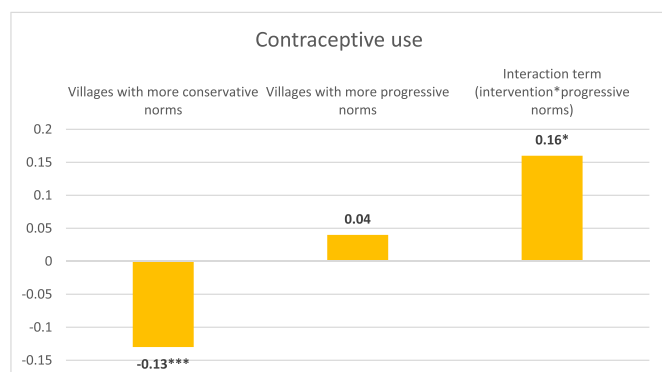


Fig. 4. Moderating effects of norms regarding contraceptive use on contraceptive use, males and females. Note: Regressions control for gender, age at baseline, district x size fixed effects. Standard errors adjusted for clustering at the community level are reported in parentheses. * $p < 0.05$, ** $p < 0.01$.

in several ways, including estimation of post-intervention impacts among males and females, examination of moderating impacts, and generation of evidence from government-implemented programming. This study has a high level of external validity given the population-based sample and government implementation of programming. Most adolescent-focused, intersectoral programming in the region to date has been implemented by non-governmental actors with limited potential for scale-up (Rogers et al., 2024). In contrast, the intervention examined in our study was subsequently scaled up to additional districts and discussions were underway in 2024 to determine whether some form of the intervention could be further scaled up nationally in the PSSN's Phase 3 (set to start in 2025).

Adolescents in the sample were in early adulthood (ages 18 to 23) at Round 4, and thus, the impacts on marriage and pregnancy found among males may be viewed in a positive light. Males who participated in the program may have been considered more eligible marriage prospects if the intervention increased their economic security, or perhaps due to increases in their gender equitable attitudes, which was evident at Rounds 2 and 3 (Chzhen et al., 2021; Tanzania Cash Plus Evaluation Team, 2021).

The lack of intervention impacts on contraceptive use (at all rounds, despite earlier impacts on knowledge of modern contraceptives and simultaneous supply-side strengthening of adolescent-friendly services) may indicate that other existing barriers remain strong, including low supply of contraceptives, conservative social norms, or a lack of

willingness of some health facility staff to provide these to adolescents. In contrast, this lack of impacts may be reflective of preferences for early childbearing and high fertility.

Despite earlier positive impacts, there were no impacts on knowledge related to HIV and contraceptives at Round 4. This does not mean the intervention failed to improve these outcomes, but rather impacts were evident earlier in adolescence, and as the sample has aged into young adulthood, knowledge levels have converged. Nevertheless, this earlier increase in knowledge attributable to the intervention may still have some lasting benefits, such as reduced HIV risk; we did find impacts at Round 4 on self-perceived HIV risk.

The intervention continued to have strong, protective impacts on lifetime sexual violence experiences among females. However, impacts related to lower perpetration of emotional and physical violence among males were not sustained at Round 4, and no impacts were detected on more recent experiences of sexual violence among females. The sexual violence-related findings may be reflective of age-sensitive risk patterns, whereby girls may be at higher risk of sexual violence at younger ages (either in schools, while collecting water, in more casual relationships, etc.) as compared to older ages, when the risks of sexual violence may be largely driven by intimate partner violence, to which females in both study arms would be equally at risk of, as the intervention did not have effects for them on marriage and cohabitation.

The intervention had earlier protective effects on mental health, but post-intervention effects were adverse, and this may reflect the incredible economic and social toll that the COVID-19 pandemic had on young people. As the intervention increased occupational aspirations and improved mental health prior to the pandemic (Palermo et al., 2024; Principe et al., 2022), the pandemic itself may have acted as a moderator, serving to amplify feelings of disillusionment and hopelessness among treatment youth, who previously saw themselves on an upward trend. Others have posited that the pandemic has had a “double” impact on entrepreneurs (Xu & Jia, 2022), with small business owners facing the same challenges to their social and emotional wellbeing as others while also contending with failing to meet expectations for their businesses. Similar to evidence from female business owners in Zambia (Xu & Jia, 2022), prior qualitative research from our sample indicated that many participants struggled to reopen their businesses after depleting their limited savings during the COVID-19 pandemic closures (Zuilkowski et al., 2024).

Although positive impacts related to gender attitudes observed in previous rounds were no longer evident by Round 4, there were improvements across both study arms over time, possibly due to life experiences during transitions to adulthood. Females lag behind their male counterparts with lower (more inequitable) gender attitudes, and the intervention largely did not improve these outcomes for females.

Moderating impacts detected in our study, including where impacts were more pronounced in villages with lower quality health services, may indicate that the intervention helped youth in these villages overcome barriers to access (whereas in villages with higher quality services, barriers may not have been as high).

Our findings are aligned with existing studies in several ways. First, some other evaluations of bundled interventions also found that most detected impacts were no longer sustained after two years or more (for example in South Africa and Uganda) (Bandiera et al., 2019; Naledi et al., 2022). Another study from Uganda similarly found protective impacts on depressive symptoms during the intervention period, but then later found that impacts were not sustained (in contrast, in our study we found protective and then adverse effects) (Kivumbi et al., 2019). However, there were some differences with existing studies. For example, a bundled intervention in Zambia (targeted to females only) found no impacts on pregnancy and marriage (Austrian et al., 2020), while we found some increases in these outcomes among males. Nevertheless, our findings from our female sample were consistent with the Zambian study, which similarly found no sustained impacts on condom use, gender equitable attitudes, or HIV knowledge (Austrian

et al., 2020). There were also some differences between our study and a bundled intervention targeted to adolescent girls in Liberia, which found sustained protective impacts on gender equitable attitudes, HIV knowledge, and a sexual and reproductive health index, but also adverse effects on risk of unwanted sexual touching (Özler et al., 2020). Finally, a bundled intervention in Kenya found different impacts from our study in terms of delays in pregnancy and marriage in one region and delays in sexual debut in another (Austrian et al., 2022; Kangwana et al., 2022), while our study found the reverse for pregnancy and marriage (among males) and no effects on sexual debut.

There are some caveats to be considered when interpreting findings. First, PSSN households experienced significant delays in their cash transfer payments over an 18-month period between 2019 and 2020. The intervention was designed as a cash plus intervention, leveraging household-level cash transfers from the PSSN and seeking to create synergistic impacts for adolescents, and payment delays likely diminished this potential. While both treatment and control arms experienced these PSSN payment delays, and thus internal validity of the study was maintained, it is impossible to determine whether post-intervention impacts would have been larger in the absence of these payment delays. For example, given the negative income shocks to households, youth may have needed to redirect resources to food and other basic needs; whereas, in the absence of those shocks, they may have been able to direct more resources to their businesses, boosting intervention effects. Second, the COVID-19 pandemic started in 2020 and continued through our data collection period (in 2021). While Tanzania's formal response to COVID-19 in 2020 was very limited, risk of contracting COVID-19 remained high (Yamanis et al., 2021), and thus the pandemic may have also mitigated potential intervention impacts.

This study has some limitations. First, the evaluation was powered to detect impacts among male and female adolescents combined and not separately as we have attempted to estimate in the current paper. Moreover, the study was not powered to detect moderating effects of contextual factors. Second, many outcomes examined are of a sensitive nature and thus may suffer from underreporting. In contrast, other outcomes such as self-reported HIV risk and testing, as well as gender equitable attitudes, may suffer from social desirability bias. However, both underreporting and social desirability bias are not expected to vary by treatment arm, and thus internal validity of the study is maintained. Further, there are some limitations related to our measurement of social norms, which we operationalized as injunctive norms (individuals' perceptions of norms (Cislaghi & Heise, 2019)) by asking individuals in the community surveys to report on social norms in their community. Finally, the study was not powered for Bonferroni's correction for multiple hypothesis testing, and thus, those findings should be interpreted with caution.

Our findings, in conjunction with the broader evidence base, lend themselves to several programmatic and research recommendations. First, instead of a narrow focus on starting a business, interventions aimed at economic strengthening may need to include more vocational training opportunities. Our finding that protective impacts on mental health and gender-equitable attitudes were no longer evident at Round 4 suggests interventions should be implemented over a longer period or in combination with broader community-level activities, particularly where social norms are deeply ingrained. Broader community participation and more sustained delivery of programming may be needed to effect normative change in contexts where there are deep-rooted and harmful normative beliefs around gender. Future interventions may need to intervene at multiple levels of the social ecological model to effect change in relational outcomes such as gender norms, sexual behaviors, condom use, and pregnancy and marriage. In contrast, when interventions target only adolescents (especially girls), they often put the onus of changing behaviors and outcomes on the most vulnerable members of society and subsequently, those with the least decision-making power. Furthermore, heterogeneous impacts by sex underscore how gender, societal expectations, and environmental context can

influence the efficacy of adolescent-targeted interventions on various domains during this transformative life-stage. In terms of research, more post-intervention studies are needed, including longer term studies of how these interventions might affect the next generation (through increased birthweight and nutrition resulting from mothers' increased empowerment, and subsequently, cognitive abilities and early childhood development). While the study has high external validity given government implementation of the intervention evaluated, more research, including process evaluations, are needed to understand recommended pathways for further scale-up and replication of this model in other contexts.

This study found limited post-intervention impacts of a cash plus intervention targeted to adolescents and implemented through government structures in Tanzania. While external factors such as lengthy delays of cash transfer payments to adolescents' households and the COVID-19 pandemic may have mitigated the potential for sustained impacts of this intervention, findings suggest that future programs may need to provide different combinations of programming (for example, vocational training, more direct linkages to agricultural extension workers, behavior change communication around gender norms, among others) or intervene at more levels of the social ecological model to influence many of the outcomes examined and to effect more lasting change.

CRedit authorship contribution statement

Jennifer Waidler: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Leah Principe:** Writing – review & editing, Methodology, Formal analysis, Conceptualization. **Nyasha Tirivayi:** Writing – review & editing, Project administration, Methodology, Conceptualization. **Tumpe Mnyawami Lukongo:** Writing – review & editing, Validation, Conceptualization. **Paul Luchemba:** Writing – review & editing, Validation, Conceptualization. **Tia Palermo:** Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Lusajo Kajula:** Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Tanzania Adolescent Cash Plus Evaluation Team:** Study design, data collection, analysis and interpretation.

Ethical statement

The study was retrospectively registered with the Pan African Clinical Trial Registry (PACTR) as PACTR201804003008116. Ethical review clearance was obtained from the National Institute for Medical Research (NIMR) in Tanzania (NIMR/HQ/R.8c/Vol. 1/1763), and research clearances were obtained from the Tanzania Commission for Science and Technology (COSTECH).

Informed consent was obtained from adult participants (aged ≥ 18 years) and married youth regardless of age [who are considered to be acting in an adult capacity Tanzania, where 29 percent of women currently aged 20–24 years re married before age 18 (Ministry of Health (Dodoma) et al., 2022)]. For minors, informed assent was obtained and informed consent was obtained from their guardians.

For the violence modules, a split sample approach (with random allocation at the village level) for males and females was used based on best practices, to reduce the likelihood that perpetrators and victims in the same community would both be interviewed (UNICEF Tanzania et al., 2011). We also provided anonymized referral information to survey respondents, following WHO guidelines for research on violence (World Health Organization, 2005).

Conflict of interest

The authors declare no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ssmph.2025.101760>.

Data availability

The authors do not have permission to share data.

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