Determinants of achieving economic and sexual and reproductive health (SRH) outcomes through multi-sectoral programming among adolescent girls in Ethiopia and Nigeria

Short Abstract (200 words)

Economic empowerment and sexual and reproductive health (SRH) can be critical levers for change for adolescent girls. Yet adolescent populations are not homogenous, and more information is needed on how demographic factors influence improvement in the economic and SRH domains. This study evaluated the results of three multi-sectoral interventions in Ethiopia and Nigeria (Ogun and Kaduna states) on key economic and SRH outcomes. The study employed a quasi-experimental design consisting of an intervention and a concurrent comparison group (n=2,776 participants total). Data was collected concurrently in both groups before participants were involved in the intervention (baseline) and nine months after (endline) for the same participants. Generalized Estimating Equation (GEE) models were fit to assess study outcomes, with an adjusted model that included covariates for baseline measures of age, marital status, education level, and parity. Analysis demonstrated that older girls and those with higher parity were more likely to have achieved key economic and SRH outcomes. This validates key evidence on the influence of age, marriage, and fertility expectations on adolescent girls' SRH choice and access and indicates that other non-health outcome areas may be similarly influenced by age and parity.

Expanded Abstract

Introduction: Adolescent girls in sub-Saharan Africa are one of the most economically, socially, and physically vulnerable groups. They experience worse outcomes across various sectors – both health and non-health – than their male peers and older women, exacerbated by deeply embedded gender norms that limit girls' decision-making power and autonomy.[1] Yet, girls have an immense, often untapped potential for innovation, creativity, and entrepreneurship. Evidence demonstrates that economic empowerment can be a critical lever for change for adolescent girls across various outcomes – supporting them to gain financial independence, improve their earning potential, increasing confidence, and improving mobility.[2] Similarly, improving adolescent girls' access to sexual and reproductive health (SRH) services and contraceptive choice can have tremendous benefits for their future health and social and economic wellbeing.[3,4] These outcomes can have spillover effects – as adolescent girls' lives improve, so does the wellbeing of their families and communities. The delivery of SRH and economic empowerment programming together has the potential to create efficiencies and amplify outcomes – simultaneously responding to what girls indicate they want, holistic solutions for their integrated needs.[5] Despite growing evidence on the types of strategies which work to improve SRH and economic outcomes for girls, there is still a paucity of information on what factors (demographic, social, and other) influence whether girls can attain these outcomes. Populations of adolescent girls are not homogenous. Achieving population-level impact requires greater attention to differing experiences of sub-groups of adolescents so that programs can effectively support improved outcomes across all adolescents.

This study was undertaken to assess program outcomes and key demographic variables influencing these outcomes in an integrated economic empowerment and SRH program for adolescent girls aged 15-19 in Nigeria and Ethiopia, implemented as part of the Adolescents 360 (A360) project. In Nigeria, the intervention was implemented in two states with two different adolescent girl populations – Kaduna state in northern Nigeria with married girls and Ogun state in southern Nigeria with primarily unmarried girls. In Ethiopia the intervention targeted married adolescent girls.

Methodology: The study was conducted from June 2022 to April 2023. We employed a quasi-experimental design consisting of an intervention and a concurrent comparison group. For the intervention group, participants were adolescent girls aged 15-19 who received a combined SRH and economic empowerment intervention. A similarly sized cohort of adolescent girls of the same age group who only received an SRH intervention constituted the comparison group. Data was collected concurrently in both groups before participants were involved in the intervention (baseline) and nine months after (endline) for the same participants. The same structured

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[2] Haberland N, Hoop de T, Desai S, Engebretsen S, Ngo T. Adolescent girls' and young women's economic empowerment programs: Emerging insights from a review of reviews. 2021 Mar.
[3] Liang M, Simelane S, Fortuny Fillo G, et al. The State of Adolescent Sexual and Reproductive Health. Journal of Adolescent Health. 2019;65(6):S3-S15. doi:10.1016/j.jadohealth.2019.09.015
[4] Akwara E, Chandra-Mouli V. Good progress in a number of areas of ASRH, but there is much more that needs to be done. Sex Reprod Health Matters. 2023;31(1). doi:10.1080/26410397.2023.2266657
[5] Cutherell, M., Bhuvanendra, D. and Nichol, K. (2024). 'Designing integrated economic empowerment and sexual and reproductive health programs for adolescent girls: A knowledge brief for practitioners'. Population Services International

questionnaire was used at baseline and endline. At endline, additional questions were included to document participants' exposure to economic empowerment programming.

The study examined both economic empowerment and SRH related outcome domains. For economic empowerment, participants were asked whether they earned money, whether they used their money to purchase an asset in the last 9 months, and how often they contributed to household expenses in the last three months. In Ethiopia, given the intervention's focus on promoting savings behaviors, the study also examined whether girls were currently saving money. In Ethiopia and northern Nigeria, the primary SRH outcome measure was current contraceptive use (as all study participants in these geographies were married it was assumed that they had potential contraceptive need). In Ogun, girls who had had sex were included in a current contraceptive use measure and current non-users of contraception (among all participants, whether sexually active or not) were asked about intention to use contraception in the future.

We used frequencies to describe participants' sample background characteristics and program dosage. Generalized Estimating Equation (GEE) models were fit for the binary outcomes using the gaussian family distribution and identity link function employing an exchangeable covariance structure using robust standard errors. The GEE model included independent variables for study group (coded as a binary variable equal to 0 for the comparison group and 1 for the intervention group), time (coded as 0 for baseline and 1 for endline) and a group-time interaction term as the difference-in-differences estimator. Model based estimates of the changes from baseline, standard errors (SE) and corresponding 95% confidence intervals (CIs) are provided along with p-values for documenting statistical significance. We report results from the adjusted models that include covariates for baseline measures parameterized as follows: age (15-17=0; 18-19=1), education level (no formal school=0; primary=1; secondary=3; above secondary =3), marital status (not married=0; married=1) and parity (none=0; 1=1 and 2 or more=2) as categorical variables.

Results: A total of 2,776 girls participated in the study (n=1,049 Kaduna, n=927 Ogun, n=800 Ethiopia). Follow-up rates were 80.2% in Kaduna, 71.6% in Ogun, and 100% in Ethiopia. Across all geographies there were significant program effects demonstrated for most of the examined economic outcomes (Table 1). Older adolescents were more likely than younger adolescents to achieve certain economic outcomes depending on the geography – in Kaduna they were more likely to be earning money and contributing to household expenses, in Ethiopia to be saving money, and in Ogun to have purchased an asset. Among married girls in Ethiopia and Kaduna, education level had minimal influence on achieving most economic outcomes. In Ogun, education level strongly influenced whether girls were contributing to household expenses – with girls who had higher levels of education more likely to be contributing. Among the demographic covariates included in the analysis, parity had the strongest influence on attaining economic outcomes. Across all geographies, adolescent girls with higher parity were more likely to be earning money, purchasing assets, and contributing to household expenses.

Program effect on current contraceptive use was only demonstrated in Kaduna. In Ogun a positive program effect on intent to use contraception among current non-users was demonstrated and there was a negative program effect on intent to use in Ethiopia. Among married girls, age did not influence SRH outcomes in the combined intervention, but among the

primarily unmarried population in Ogun, older girls were more likely to be currently using contraception in the combined intervention. In Ogun higher levels of education negatively influenced likelihood of current contraceptive use. In Ethiopia, higher levels of education were associated with greater intent to use contraception. In Kaduna education levels had minimal influence on either intent or current use. As with the economic outcomes, parity showed strong association with SRH outcomes, particularly among the populations of married adolescent girls in Ethiopia and Kaduna. In Ethiopia, girls with 1 or more children were significantly more likely to be using contraception. In Kaduna girls with 1 or more children were significantly more likely to intend to use and girls with 2 or more children more likely to be currently using contraception.

Discussion

The study illuminates key variables for consideration when implementing multi-sectoral interventions with populations of adolescent girls. Though the findings demonstrated overall positive program effect on key economic outcomes, and on some SRH outcomes, covariate analysis suggests that these effects were experienced differently by sub-populations of girls based on certain demographic factors, with older adolescents and those with higher parity in particular having greater likelihood of demonstrating outcomes.

Reasons for the influence of parity on SRH outcomes is well documented – with norms regarding marriage and fertility expectations especially among married adolescents creating barriers to girls' contraceptive use.[6] These findings suggest that these factors (and potentially others) might also influence attainment of economic outcomes. We speculate that for the married girl populations in Ethiopia and northern Nigeria, limited mobility and pressure to prove fertility may restrict whether and how girls who don't yet have a child can pursue their economic goals. It may therefore be critical for programs to incorporate elements of BCC in multi-sectoral programs for married girls that address influencers' resistance to girls' economic activities before they have children. A360's programming in Ethiopia, for example includes critical elements to establish support among male partners and community leaders for the value of girls' economic participation.

In contrast, for unmarried girls (such as those in our study population in Ogun), adolescent mothers might be less likely to be in school and feel added pressure to provide financially. For these populations, segmented support which differentiates by school status or parity could be more effective. Regardless of the mechanism by which parity influences these outcomes, it is clear that availability of and access to this multi-sectoral programming alone may not be sufficient to see equitable outcomes for adolescents at a population level.

[6] de Vargas Nunes Coll C, Ewerling F, Hellwig F, de Barros AJD. Contraception in adolescence: the influence of parity and marital status on contraceptive use in 73 low-and middle-income countries. Reprod Health. 2019 Feb 21;16(1):21. doi: 10.1186/s12978-019-0686-9. PMID: 30791914; PMCID: PMC6383262.

Table 1: Program effect and demographic factor influence on key economic and SRH outcomes

	Earns Money			Saves Money	Purchases Assets			Contributes to household expenses			Contraceptive Use			Intends to use contraception		
	Ethiopia	**Kaduna**	**Ogun**	**Ethiopia**	**Ethiopia**	**Kaduna**	**Ogun**	**Ethiopia**	**Kaduna**	**Ogun**	**Ethiopia**	**Kaduna**	**Ogun**	**Ethiopia**	**Kaduna**	**Ogun**
Time*Intervention (DiD	0.18*** (0.09; 0.27)	0.35*** (0.27; 0.42)	0.58*** (0.50; 0.67)	0.45*** (0.30; 0.60)	0.21*** (0.12; 0.31)	0.06 (-0.01; 0.13)	0.31*** (0.23; 0.38)	0.14** (0.05; 0.23)	0.29*** (0.21; 0.36)	0.23** (0.11; 0.44)	-0.07 (-0.15; 0.02)	2.08** (0.67; 3.48)	0.18 (-0.01; 0.37)	-0.17** (-0.28; -0.06)	0.01 (-0.13; 0.15)	0.48** (0.21; 0.75)
Program Exposure																
Comparison	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Intervention	0.12*** (0.06; 0.18)	-0.10** (-0.17; -0.03)	-0.05 (-0.11;0.01)	0.04 (-0.09; 0.16)	0.03 (-0.04; 0.10)	-0.03 (-0.09; 0.04)	-0.27*** (-0.34; -0.21)	0.12*** (0.06; 0.18)	-0.11** (-0.18; -0.04)	-0.11 (-0.27; 0.05)	0.04 (-0.02; 0.09)	-1.79** (-3.02; -0.55)	-0.22** (-0.37; -0.07)	0.05 (-0.02; 0.12)	0.27*** (0.19; 0.36)	-0.01 (-0.26; 0.25)
Period																
Baseline	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Endline	0.15*** (0.08; 0.21)	0.08** (0.02; 0.14)	0.16*** (0.09;0.23)	-0.08 (-0.21; 0.05)	-0.07* (-0.14; 0.00)	0.10*** (0.05; 0.15)	0.08** (0.03; 0.14)	0.14*** (0.08; 0.20)	0.15*** (0.09; 0.22)	-0.30*** (-0.43; -0.16)	0.07* (0.01; 0.13)	0.05 (-0.61; 0.71)	-0.32*** (-0.43; -0.20)	0.05 (-0.02; 0.12)	0.04 (-0.05; 0.14)	-0.14 (-0.34; 0.06)
Age																
Age 15-17	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Age 18-19	-0.03 (-0.08; 0.02)	0.11** (0.04; 0.18)	0.07 (0.02;0.11)	0.08* (0.01; 0.15)	0.04 (-0.02; 0.10)	-0.02 (-0.08; 0.04)	0.07** (0.03; 0.11)	-0.04 (-0.09; 0.01)	0.08* (0.02; 0.15)	0.06 (-0.01; 0.12)	-0.03 (-0.08; 0.02)	-0.05 (-1.24; 1.13)	0.11* (0.02; 0.20)	0.05 (-0.02; 0.12)	0.03 (-0.06; 0.13)	-0.10 (-0.24; 0.05)
Married/ Living as Married																
No	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Yes	0.11 (-0.15; 0.38)		0.05 (-0.06;0.16)	0.48*** (0.28; 0.68)	0.30** (0.10; 0.50)		-0.05 (-0.12; 0.03)	0.14 (-0.08; 0.35)		0.15* (0.00; 0.31)	0.39* (0.08; 0.70)		0.01 (-0.15; 0.17)	0.46** (0.15; 0.77)		0.14 (-0.07; 0.35)
Highest Level of Education																
No formal education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Primary	-0.02 (-0.12; 0.09)	0.02 (-0.08; 0.13)	0.16 (-0.26;0.59)	0.05 (-0.10; 0.21)	0.06 (-0.05; 0.17)	0.03 (-0.05; 0.12)	-0.08 (-0.47; 0.31)	-0.04 (-0.14; 0.06)	-0.01 (-0.12; 0.09)	0.40*** (0.18; 0.62)	0.04 (-0.05; 0.14)	0.09 (-1.61; 1.79)	-0.50* (-0.90; -0.09)	0.28** (0.11; 0.45)	0.13* (0.00; 0.27)	
Secondary	-0.01 (-0.11; 0.10)	0.10* (0.01; 0.19)	0.14 (-0.27;0.54)	0.10 (-0.06; 0.25)	0.08 (-0.03; 0.20)	0.02 (-0.05; 0.09)	0.01 (-0.36; 0.39)	-0.04 (-0.14; 0.07)	0.09* (0.00; 0.17)	0.30*** (0.20; 0.39)	0.12* (0.02; 0.21)	0.85 (-0.36; 2.06)	-0.32*** (-0.47; -0.17)	0.22* (0.04; 0.40)	0.04 (-0.07; 0.16)	-0.19 (-0.50; 0.12)
Above Secondary	0.02 (-0.20; 0.24)	0.08 (-0.02; 0.18)	0.18 (-0.23;0.60)	0.04 (-0.21; 0.29)	0.20 (-0.01; 0.41)	0.05 (-0.04; 0.13)	0.03 (-0.34; 0.41)	0.02 (-0.21; 0.24)	0.07 (-0.02; 0.17)	0.29*** (0.16; 0.41)	0.18 (-0.03; 0.39)	1.02 (-0.60; 2.65)	-0.50** (-0.50; -0.13)	0.31** (0.13; 0.50)	0.06 (-0.09; 0.20)	-0.17 (-0.52; 0.18)
Parity																
0	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1	0.05 (0.00; 0.11)	0.07* (0.00; 0.14)	0.13** (0.04; 0.22)	0.01 (-0.07; 0.10)	0.05 (-0.01; 0.11)	0.14*** (0.07; 0.20)	0.14*** (0.09; 0.20)	0.06* (0.00; 0.11)	0.12** (0.05; 0.19)	0.19** (0.08; 0.31)	0.34*** (0.29; 0.40)	1.45 (-0.43; 3.33)	-0.04 (-0.20; 0.11)	0.03 (-0.03; 0.09)	0.19*** (0.11; 0.28)	0.11 (-0.09; 0.31)
≥2	0.13*** (0.06; 0.20)	0.13*** (0.06; 0.20)	0.12*** (0.06;0.18)	0.04 (-0.05; 0.13)	0.08* (0.01; 0.16)	0.20*** (0.14; 0.26)	0.12*** (0.08; 0.16)	0.14*** (0.08; 0.21)	0.20*** (0.13; 0.27)	0.12*** (0.03; 0.21)	0.29*** (0.22; 0.36)	2.03* (0.20; 3.86)	0.01 (-0.14; 0.15)	0.00 (-0.09; 0.08)	0.20*** (0.11; 0.28)	0.05 (-0.12; 0.22)

Note: *p<.05. **p<.01. ***p<.001