

Title: A LONGITUDINAL ANALYSIS OF AGENCY AND STRUCTURAL DETERMINANTS OF ADOLESCENT SEXUAL AND REPRODUCTIVE HEALTH OUTCOMES IN ETHIOPIA

Background: Adolescents in Ethiopia face significant challenges to their sexual and reproductive health (SRH) and well-being. Most of these barriers are deeply rooted in their social, economic, and environmental contexts including limited access to services and information, violations of SRH rights, and exposure to harmful social norms. Research on how these multidimensional factors impact ASRH outcomes over time remains limited. This study examines the dynamics and impact of agency and structural factors on two key SRH outcomes: early marriage and adolescent pregnancy among adolescent girls in Ethiopia.

Methods: We used longitudinal data from the first two rounds (two years apart) of Ethiopia Gender and Adolescence: Global Evidence (GAGE) survey, comprising a balanced sample of 556 adolescent girls aged 15-17 at baseline. Using multi-level regression models, we then explored the effect of multiple elements of agency and structural factors on ASRH outcomes. Agency variables included four individual level binary variables: attending SRH classes, participating in religious classes, access to media, discussing educational and career aspirations with caregivers and three continuous: educational attainment, perceived decision-making autonomy and perceived self-esteem. Structural factors were assessed at both the individual-level and community-level (aggregate) and included four variables on perceived social norms: perceptions on child marriage and gender stereotypes in employment, decision-making, educational opportunities, and success trajectories. Community-level perceptions were derived by aggregating the perceptions of girls from the same community. The SRH outcomes: early marriage and adolescent pregnancy were measured at round 2 and assessed as both binary and continuous variables. The regression models adjusted for sociodemographic factors including age, source of household income, place of residence, adolescent functional disabilities and accounted for survey weights.

Results: Findings indicate significant improvements across survey rounds in caregiver-adolescent discussions about career aspirations, school progression, access to media, and perceptions that men and women have equal opportunities. Despite most girls' intentions to postpone marriage and childbearing until after adolescence, many marry and begin having children before the age of 20. Regression results show that, at the individual-level, girls who had ever discussed their career aspirations with caregivers were at lower risk of early marriage and adolescent pregnancy. Furthermore, girls' who perceived that their community offers gender-equitable employment opportunities were at lower risk of early marriage. At the community level, living in a community with more prevalent perceptions that culture favours boys' success over girls' is associated with increased risk of adolescent pregnancy.

Conclusion: Results highlight the need for multidimensional and gender-sensitive interventions and strategies to enhance ASRH and well-being. Interventions that can support individual agency and simultaneously shift social norms may be particularly effective in improving SRH outcome among adolescent girls in Ethiopia

Table 1. Changes in agency and structural factors across survey round

| | Balanced panel of adolescent girls (N =556) | | | |
|---|---|-------------|-------------|-------------|
| | Round 1 | Round 2 | Change | p-value |
| Agency variables | | | | |
| Ever attended classes on SRH topics? | 462 (83.2) | 468 (84.1) | -0.96 | 0.71 |
| Ever participated in any type of religious instruction class? | 225 (40.5) | 285 (51.2) | -10.74 | 0.00 |
| Access to media | 499 (89.7) | 513 (92.3) | -2.59 | 0.29 |
| Discussing career aspirations with caregivers | 40 (7.1) | 44 (7.9) | -0.77 | <0.001 |
| Perceived decision-making autonomy | 90 (16.1) | 123 (22.2) | -6.08 | <0.001 |
| Years of education | 7.95 (3.38) | 8.35 (4.55) | -0.41 | <0.001 |
| Structural variables | | | | |
| Individual Level perceptions of social norms | | | | |
| Most people expect men to have the final word | 280 (50.4) | 255 (45.9) | 4.50 | 0.57 |
| Men and women have equal opportunities | 366 (65.8) | 342 (61.5) | 4.32 | <0.001 |
| Most adolescent girls in my community marry before the age of 18 | 105 (18.9) | 110 (19.8) | -0.90 | 0.07 |
| Culture makes it harder for girls to achieve their goals | 182 (32.7) | 182 (32.7) | 0.00 | 1.00 |
| Families should prioritise the education of boys | 71 (12.8) | 67 (12.1) | 0.72 | 0.87 |
| Community-level perceptions of social norms (% of adolescents who agree) | | | | |
| Most people expect men to have the final word | 0.51 (0.5) | 0.49 (0.5) | 2.45 | 0.13 |
| Men and women have equal opportunities | 0.66 (0.17) | 0.63 (0.48) | 2.97 | 0.04 |
| Most adolescent girls in my community marry before the age of 18 | 0.2 (0.15) | 0.2 (0.4) | -0.56 | 0.23 |
| Culture makes it harder for girls to achieve their goals | 0.33 (0.47) | 0.36 (0.48) | -2.82 | 0.49 |
| Families should prioritise the education of boys | 0.12 (0.32) | 0.13 (0.34) | -1.01 | 0.25 |

Data are n (%) for categorical variables and mean (SD) for continuous variables.

Changes are measured in percentage points for all variables except for school progression (measured in years of education)

Table 2. Distribution of SRH outcomes among adolescent girls (N=556)

| | Round 2 |
|---|--------------|
| ASRH outcomes (continuous variables) | |
| Age at first marriage | 16.72 (1.40) |
| Age at first pregnancy | 17.43 (1.08) |
| ASRH outcomes (binary variables) | |
| Ever married | 34 (6.1) |
| Ever been pregnant | 24 (4.3) |

Data are mean (SD) for continuous variables and n (%) for categorical variables.

Figure 1. Correlation between ideal and actual ages of first marriage and pregnancy in girls.

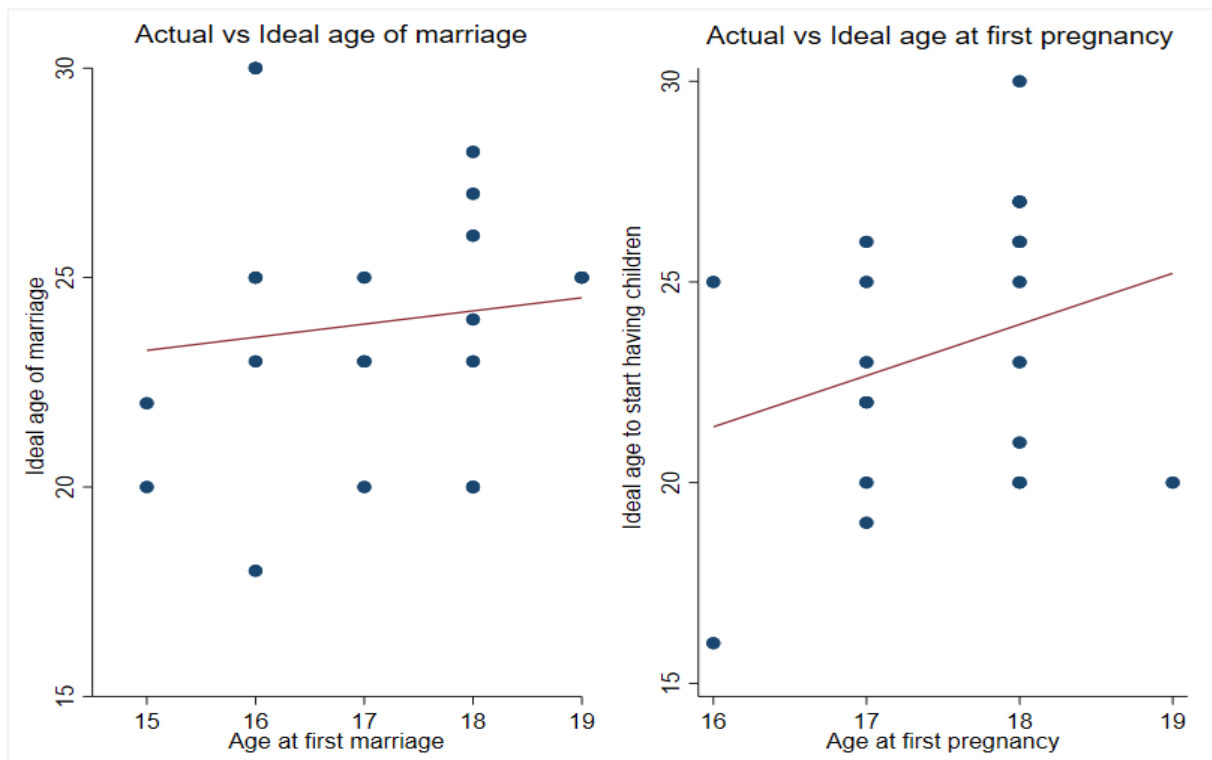


Table 3. Relationship between empowerment factors and ASRH outcomes in girls (N=556)

| | OR (CI) p | AOR (CI) p | Coeff (CI) p | Coeff (CI) p |
|---|-------------------------|---------------------------|------------------------------|-------------------------------|
| Agency variables | Ever married | Ever been pregnant | Age at first marriage | Age at first pregnancy |
| Ever attend classes on puberty on any of these topics | 0.47 (0.11,1.91) ;0.29 | 1.38 (0.21,8.93) ;0.74 | 1.37 (0.16,2.57) ;0.03 | 1.77 (0.52,3.01) ;0.01 |
| Ever participated in any religious instruction class | 0.79 (0.21,3.03) ;0.73 | 0.45 (0.06,3.19) ;0.42 | 0.42 (-0.54,1.39) ;0.38 | 0.85 (0.1,1.59) ;0.03 |
| Access to media (internet, radio, tv) | 0.32 (0.06,1.77) ;0.19 | 0.19 (0.02,2.13) ;0.18 | 1.48 (0.18,2.77) ;0.03 | 0.4 (-0.56,1.35) ;0.4 |
| Ever discussed career/educational aspirations with caregiver (s) | 0.13 (0.02,0.89) ;0.04 | 0.04 (0,0.59) ;0.02 | -0.88 (-2.62,0.87) ;0.32 | 2.13 (-0.13,4.39) ;0.06 |
| Perceived autonomy in decision-making regarding one's life (mean) | 0.71 (0.09,5.61) ;0.75 | 0.35 (0.02,6.73) ;0.48 | 0.64 (-0.19,1.47) ;0.13 | 0.51 (-0.83,1.85) ;0.44 |
| Highest level of education attained (mean) | 1.17 (0.96,1.41) ;0.12 | 1.1 (0.89,1.35) ;0.37 | 0.1 (0.01,0.22) ;0.04 | 0.12 (0.05,0.19) ;<0.001 |
| Structural variables | | | | |
| Individual- level perceptions on social norms | | | | |
| Men make most decisions in my community | 0.79 (0.19,3.29) ;0.75 | 0.32 (0.07,1.56) ;0.16 | 0.35 (-0.89,1.58) ;0.57 | 0.95 (-1.01,2.91) ;0.33 |
| Men and women in my community have equal employment opportunities | 0.24 (0.06,0.9) ;0.04 | 0.58 (0.15,2.23) ;0.42 | 0.03 (-0.69,0.76) ;0.92 | 0.45 (-0.53,1.42) ;0.36 |
| Most adolescent girls in my community marry before the age of 18 | 0.78 (0.27,2.25) ;0.64 | 1.2 (0.52,2.74) ;0.67 | 0.48 (-1.01,1.96) ;0.52 | -0.13 (-1,0.73) ;0.76 |
| Our culture makes it harder for girls to achieve their goals than boys | 0.25 (0.07,0.9) ;0.04 | 0.45 (0.09,2.23) ;0.32 | -0.36 (-1.56,0.84) ;0.55 | 0.66 (-0.28,1.6) ;0.16 |
| Families should prioritise the education of boys over that of girls | 0.58 (0.08,4) ;0.58 | 0.58 (0.04,9.21) ;0.69 | 0.93 (-0.4,2.25) ;0.17 | -1.69 (-4.29,0.91) ;0.19 |
| Community level perceptions on social norms (% adolescents who agree that) | | | | |
| Men make most decisions in my community | 2.68 (0.46,15.42) ;0.27 | 3.76 (0.65,21.7) ;0.14 | 1.8 (0.07;3.53) ;0.04 | 1.2 (0.19; 2.58) ;0.04 |
| Men and women in my community have equal employment opportunities | 0.88 (0.17,4.65) ;0.88 | 0.87 (0.17,4.44) ;0.87 | -0.45 (-1.16,0.27) ;0.21 | -0.12 (-1.06,0.83) ;0.8 |
| Most adolescent girls in my community marry before the age of 18 | 1.73 (0.46,6.46) ;0.41 | 1.04 (0.37,2.89) ;0.94 | 0.08 (-0.65,0.81) ;0.83 | -0.06 (-1.13,1) ;0.9 |
| Our culture makes it harder for girls to achieve their goals than boys | 3.56 (0.39,32.24) ;0.26 | 5.73 (0.58,56.69) ;0.13 | 1.44 (-0.56,3.45) ;0.15 | -0.95 (-3.65,1.75) ;0.47 |
| Families should prioritise the education of boys over that of girls | 3.78 (0.66,21.58) ;0.13 | 4.71 (0.93,23.99) ;0.06 | 0 (0,0) ;0 | -3.41 (-5.42, -1.39) ;<0.001 |
| Covariates | | | | |
| Religious affiliation | | | | |
| Other Christian | 0.31 (0.04,2.45) ;0.26 | 0.47 (0.06,3.35) ;0.45 | 0.4 (-1.7,2.51) ;0.7 | . |
| Ethiopian Orthodox | 0.06 (0.01,0.53) ;0.01 | 0.08 (0.01,0.53) ;0.01 | 0.03 (-1.38,1.44) ;0.97 | . |
| Muslim | 0.23 (0.03,1.49) ;0.12 | 0.11 (0.01,1.18) ;0.07 | -0.57 (-1.51,0.38) ;0.23 | . |
| Source of household income =non- farming | 0.53 (0.16,1.73) ;0.29 | 0.4 (0.1,1.63) ;0.2 | -0.72 (-2.48,1.04) ;0.41 | -0.33 (-0.75,0.1) ;0.12 |
| Ideal age of marriage | 1 (0.91,1.09) ;0.93 | 1.02 (0.89,1.18) ;0.76 | . | . |
| Ideal age to having children | 1.02 (0.97,1.08) ;0.43 | 0.99 (0.94,1.05) ;0.78 | . | . |
| ICC | 0.2290 | 0.0000 | 0.0000 | 0.000 |

OR: Adjusted odd ratios, CI: 95% confidence interval, Coeff: Linear regression coefficient.