

Beyond the Dropout Statistic: A Multi-Indicator Analysis of the Educational Attrition Cascade Following Adolescent Pregnancy Among Female Secondary Learners in Kilifi County, Kenya

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ABSTRACT

Although adolescent pregnancy is commonly cited as a cause of female school drop-out in sub-Saharan Africa, the majority of the studies on this topic have used only one measure, typically dropout rate, and few studies have followed the progression of the disadvantages that occur in girls' subsequent schooling. This article is based on findings from a convergent parallel mixed methods study involving 353 adolescent girls aged 15-19 years, 28 secondary schools, and 67 secondary school education officials, teachers, parents and out-of-school adolescent mothers in Kilifi County, Kenya on the association between adolescent pregnancy and adolescent girls' academic journey. The data collected were quantitative (structured questionnaire, school administrative data) and qualitative (interviews, focus group discussion) and were analysed using chi-square, binomial, descriptive statistics and thematic analysis respectively. There were 157 students who became pregnant, and 90.4% of them dropped out of school; only 16.2% ($p < .001$) of these students re-enrolled, which was much lower than the 31.0% county average. However, the retention rates for the pregnant students decreased from 34.6 percent from Form 1 to 2 to 19.8 percent from Form 3 to 4, with the gap between pregnant and general students' retention rates widening from 52.7 percentage points to 59.8 percentage points. Less than 1 in 8 pupils who became pregnant completed their secondary education (8.9%) compared to 71.4% of non-pregnant pupils, and the lower the secondary completion rate the sooner the pregnancy took place during the school cycle. Despite being successful in Form 4, only 7.1% of the pregnant students entered into tertiary education, while 52.8% of the non-pregnant students went to tertiary education. These findings are not about one exit, but a series of attritions, where disadvantage builds at each stage. It suggests a framework of a sequence of indicators to monitor this cascade and contends that actions to prevent students from dropping out will systematically underestimate, and under-address, the extent of educational loss.

Keywords: adolescent pregnancy; school dropout; academic progression; retention and completion; Kilifi County, Kenya

INTRODUCTION

Adolescent pregnancy continues to be one of the most prevalent barriers to girls' education in sub-Saharan Africa with Kenya not being an exception. The national level of adolescent pregnancy is estimated to be nearly 20% of adolescent girls aged 15-19 years, across regions there is significant variation [1]. In Kenya, Kilifi County, located along the coast, has not only experienced rates that are higher than the national average, there are also cultural norms that encourage early childbearing, lack of access to reproductive health services, and poverty. There is a significant amount of research that has shown that school dropout among adolescent girls is strongly linked to pregnancy [2, 3]. Most of this literature, however, comes to an end at the point of exit. Little is known about what happens after school, for example, whether girls who drop out ever return, the probability of retention at every school stage transition, if school dropping-out is

associated with a change of probability of eventual completion due to the timing of pregnancy, and whether there is a correlation between disadvantage and eventual completion despite the small proportion who do finish secondary school. This problem is important because a dropout is just the first of a series of further educational decisions and limitations. A learner who comes out of school at Form 1, is exposed to a different set of barriers to his/her re-entry in school as compared to a learner coming out at Form 4, and a different long route to school as compared to the latter. By lumping all "dropout due to pregnancy" together, it may be missing out on identifying the point along this chain of interventions that has the greatest impact. This article fills that gap by utilising data from a wider mixed methods study which looked at the second objective of the study: to examine the association between adolescent pregnancy and academic progression indicators of female learners in secondary schools in Kilifi County. In doing so, it provides a multi-indicator, cascaded story of educational attrition a story that tracks the experiences of pregnant learners from dropout to re-entry to academic performance to grade-to-grade retention to completion to post-secondary transition and reveals that the gap between pregnant and non-pregnant learners grows rather than closes over time. The progression-indicator framework and the gradient in timing of the pregnancy that it illuminates, is the study's main contribution to the literature on adolescent pregnancy and education in sub-Saharan Africa.

METHODS

The broad investigation from which this article is extracted was of a convergent parallel mixed methods design with quantitative data collected at the same time as qualitative data and both qualitatively and quantitatively analysed in the process of interpretation. The intended beneficiaries were learners of secondary school (15-19 years) in public secondary schools in the seven sub-counties of Kilifi County. Multi-stage sampling was employed: the county was stratified into rural and semi-urban areas and schools were sampled by probability proportional to size within each of these areas and students were sampled by systematic random sampling. The Cochran (1977) formula for estimating a population proportion was used to determine the sample size, which was increased to account for potential non-response and attrition, to obtain a final sample of 353 female students. Semi-structured interviews were conducted with purposively selected education officials ($n = 15$), teachers ($n = 22$), and parents ($n = 12$) drawn from the 28 participating schools, selected for their direct involvement in pregnancy-related re-entry or retention decisions. Out-of-school adolescent mothers ($n = 18$) were identified through snowball sampling, beginning with referrals from participating schools and community health volunteers, until thematic saturation was reached. The study used a cross-sectional, convergent parallel mixed methods design, but the progression indicators presented here (re-entry, retention across form transitions, completion, and post-secondary transition) were determined at a single time point in data collection, and thus, were not followed over time for the same population. Retention and completion rates are therefore not a measure of the progress of a cohort in school but represent a cross cohort comparison of students at different form levels at the point of the data collection. This distinction can be seen as a limitation in Section 5.

Quantitative data on the outcomes of progression, dropout, retention, completion and transition were obtained from a structured student questionnaire, and confirmed using a standardized extraction protocol with administrative data from the 28 schools involved. Descriptive statistics were used to summarize the distribution of outcomes by pregnancy status, a chi-square goodness-of-fit test was used to determine whether the distribution of school discontinuation differed from an expected even split of 50.0% discontinuation and 50.0% continuation, the standard theoretical expectation for a binary outcome in the absence of a prior population benchmark specific to this sample [4]. Differences in mean examination scores by pregnancy status were tested using independent-samples t-tests (non-pregnant versus pregnant-in-school; non-pregnant versus returned-after-pregnancy), with standard deviations reported alongside each mean. A Cochran–Armitage test for trend was used to assess whether the probability of secondary school completion increased significantly with later timing of pregnancy onset (Form 1/2, Form 3, Form 4). Interviews and focus group discussions were audio-recorded with consent, transcribed verbatim, and analysed using Braun and Clarke's six-phase thematic analysis: familiarisation with transcripts, generation of initial codes, searching for themes, reviewing themes against the coded data, defining and naming themes, and producing the final thematic account. Trustworthiness of the qualitative findings was supported through independent coding by two researchers, with inter-rater agreement assessed using Cohen's Kappa (target coefficient >

0.6), consistent with the inter-rater reliability procedure established during the pilot study. Findings were further strengthened through triangulation of the qualitative themes against the quantitative results.

RESULTS

School Discontinuation and Re-Entry

Of the 157 students who got pregnant, 142 (90.4%) stopped school and 15 (9.6%) continued until they had the baby. Of the dropouts, 58.5% had been away from school for over a year prior to any re-enrolment efforts. Only 23 of the 142 dropouts (16.2%) returned to school, and 83.8% did not come back. This pattern of discontinuation differed significantly from an expected even distribution of 50.0% discontinuation and 50.0% continuation, $\chi^2(1, N = 157) = 109.4, p < .001$. A one-sample binomial test also demonstrated that the re-entry rate of the sample (16.2%) was significantly lower than the re-entry rate reported in the existing county estimate (31.0%) ($p < .001$), suggesting that re-entry outcomes in this sample were significantly poorer than those reported in the existing county estimate. This comparison should be interpreted with caution: the 31.0% benchmark was drawn from a 2021 county-level administrative report [4] that may differ from the present sample in the population covered (all re-entries countywide versus re-entries among the 157 study respondents), the definition of re-entry applied (formal re-admission versus any resumption of schooling, including informal arrangements), and the reference year (2021 versus 2025 data collection); it is therefore offered as an indicative benchmark rather than a strict statistical equivalence test.

Academic Performance and Grade Repetition

Non-pregnant students averaged 58.4% in examinations (SD = 8.71), compared with 41.7% (SD = 7.85) among students who remained pregnant in school, $t(17.19) = 7.88, p < .001$, and 39.2% (SD = 8.52) among students who returned after pregnancy, $t(28.58) = 10.18, p < .001$. Class repetition was also markedly higher among pregnant students, at 67.3%, compared with 18.7% among non-pregnant students.

Retention Across School Transitions

Retention data aggregated at the school level for the 28 participating schools showed that overall retention (all students, school-level average) declined modestly across the school cycle, from 87.3% at the Form 1–2 transition to 79.6% at the Form 3–4 transition, while retention among the 157 pregnant students in the sample (student-level data) collapsed far more steeply, from 34.6% to 19.8% over the same span.

Table 1. Academic Progression Indicators by Pregnancy Status

Progression Indicator	Non-Pregnant Students	Pregnant Students	Gap (pp)	n (pregnant)
School discontinuation rate	-	90.4%	-	157
Re-entry rate after dropout	31.0% (county benchmark)	16.2%	14.8	142
Mean examination score	58.4%	39.2- 41.7%	16.7- 19.2	38
Class repetition rate	18.7%	67.3%	48.6	157
Retention, Form 3 → Form 4	79.6%	19.8%	59.8	28 schools
Secondary completion rate	71.4%	8.9%	62.5	157
Transition to tertiary (Form 4 completers)	52.8%	7.1%	45.7	14

Note. pp = percentage points. Non-pregnant and pregnant retention and completion rates are calculated at the student level ($n = 157$ pregnant students; comparison group of non-pregnant students drawn from the same 28 schools). The Form 3 → Form 4 retention row is calculated at the school level (28 schools) rather than the individual student level, reflecting aggregate school-level retention data; all other rows in this table are calculated at the student level. Compiled from student survey and school administrative record data collected in 2025.

Completion Rates and the Timing of Pregnancy

Students who became pregnant were less likely to complete secondary school (8.9%) than those who were not pregnant (71.4%) with a difference of 62.5 percentage points. The timing of pregnancy in the school cycle was found to be a crucial factor; of the 150 students with recorded timing, 87 (58.0%) became pregnant in Form 1 or 2, 39 (26.0%) in Form 3, and 24 (16.0%) in Form 4. Completion rates rose with later pregnancy onset 4.3%, 11.7%, and 18.9% respectively (Table 2). A Cochran–Armitage test for trend confirmed a statistically significant increase in completion likelihood with later timing of pregnancy onset, $z = 2.56$, $p = .010$, indicating that earlier pregnancy onset is associated with a more prolonged and severe reduction in eventual completion.

Table 2. Secondary School Completion Rate by Form Level at Onset of Pregnancy

Form Level at Onset of Pregnancy	n	Completed Form 4	Completion Rate (%)
Form 1 or Form 2	87	4	4.3
Form 3	39	5	11.7
Form 4	24	5	18.9
Timing not recorded	7	0	0
Total	157	14	8.9

Note. Compiled from school administrative records and student survey data, 2025. Timing of pregnancy onset could not be determined for 7 students from available school records; these cases are excluded from the timing-gradient analysis but included in the overall completion rate. Compiled from school administrative records and student survey data, 2025.

Transition to Post-Secondary Education

This sets the stage for success in the transition to post-secondary education. Among those who were able to do Form 4, the situation of disadvantage remained. Pregnant completers were 7.1% compared to 52.8% of non-pregnant completers in tertiary education, a difference of 45.7 percentage points. The most common reasons given by interviewed students and mothers for this disparity were the responsibilities of childcare and affordability rather than lack of aspiration.

Compounding Barriers and Aspirations

The childcare responsibilities (87.9%), financial constraints (82.3%), stigma from teachers and peers (76.4%), domestic duties (71.2%), and a poor learning environment (58.7%) were all noted as major barriers for academic performance by pregnant respondents. Pregnant students were also less likely to have tertiary or college education aspirations; 28.7% aspired to tertiary or college education while 64.3% of non-pregnant students did. Only 34.2% were uncertain about their education compared to 12.9% of the non-pregnant students. Again, childcare (89.4%) and financial barriers (84.7%) were the two most frequent reasons not to return to school, followed by stigma and shame (73.6%), lack of family support (67.8%) and school inflexibility (61.1%).

These were corroborated by qualitative accounts. One head teacher remarked that, "Once a girl becomes pregnant, it is as if her academic life is over" and a sub-county education director stated that "County is losing its best girls to pregnancy. A Form 3 pupil who stayed on during her pregnancy spoke about the double burden of stigma and divided attention, while an out of-school pregnant teenager said she would like to go back to school, but it's not possible because childcare is too expensive.

DISCUSSION

The dropout rate of 90.4% seen in this study is significantly higher than the range of 8-15% for pregnancy-related dropout reported in a cross-country meta-synthesis conducted by Crooks et al. [3] and is higher than the typical range reported by the World Health Organization for pregnancy outcomes in general. This implies that the institutional and social context of pregnant learners in Kilifi County is very unhelpful,

similar to the poverty, the stigma and the insufficient institutional supports observed elsewhere in the study. The 16.2% re-entry rate found here is markedly lower than the county rate of 31.0% reported by the Kilifi County Education Gender Desk [4], and also falls short of the roughly 30% re-entry rate reported in comparable African contexts by the Population Council [5]. Despite the national re-entry policy [11]. This is consistent with the study by Mukabana et al. [6] in a similarly poor income earning community in Kenya, where stigma, childcare and financial constraints were cited as the key factors influencing non-re-entry, all of which were cited by the non-returning students in this study.

This completion gap of 62.5 percentage points is higher than the 24-37% reduction in adolescent pregnancy completion probability observed in a systematic review conducted in sub-Saharan Africa by Yakubu and Salisu [7] which indicates that adolescent pregnancy disadvantage is worsened in the Kilifi context. The earlier timing of pregnancies found in this study is associated with significantly lower completion rates, which is similar to the pattern reported by Zulaika et al. [8] among adolescent girls in Kenya, and consistent with the chronosystem dimension of Bronfenbrenner's ecological model [9] which supports the idea that the developmental stage and duration of the disruptive event will influence its long-term outcomes. The significant drop in educational aspiration among pregnant learners echoes that of "foreclosed future orientation" as described by Zulaika et al. [8] which implies that the impact of the pregnancy is not limited to school attendance, but it also impacts how girls envision their future. Lastly, the high proportion of adolescent girls who completed Form 4 who still faced a high transition barrier is as found by Nanyama and Masinde [10] that the major disadvantage for tertiary education enrolment by adolescent mothers in Kenya is economic vulnerability, specifically childcare costs. The quantitative and qualitative strands of this study converge to explain not only the scale of attrition but its mechanism. Where the quantitative data establish that childcare responsibilities (87.9%) and financial constraints (82.3%) were the most frequently cited barriers to academic performance, the qualitative accounts illustrate how these barriers operate in practice: the out-of-school adolescent mother who wished to return but was constrained entirely by the cost of childcare gives lived texture to the 89.4% of non-returning students who cited childcare as a barrier, while the head teacher's observation that a pregnant girl's academic life is effectively over reflects the institutional stigma that the quantitative data show shaping only 28.7% of pregnant students' tertiary aspirations. This joint reading indicates that the quantitative attrition cascade and the qualitative accounts of stigma, caregiving burden, and foreclosed aspiration are describing the same underlying process from two complementary vantage points, rather than two separate sets of findings.

Taken together, these results move the discussion beyond a single dropout statistic toward a cumulative attrition cascade: disadvantage does not end at the point of dropout but recurs, and in several respects worsens, at every subsequent transition, from re-entry, through grade progression, to completion and tertiary enrollment. The most important empirical finding in this article is this cascade framing, along with the timing-of-pregnancy gradient that was documented. These have been reported in African literature in the past as either dropout or completion, but in the present findings these two indicators are sequentially connected and interventions focused on the early dropout rates would systematically underestimate the scale of intervention needed to achieve educational equity for adolescent mothers.

CONCLUSION AND IMPLICATIONS

The results presented here show that adolescent pregnancy is linked not just to one moment in the educational process when a child drops out, but to a cascade of disadvantage in dropping out, returning to school, school performance, school retention, school completion and post-secondary transition. Policy and programming should not be limited to dropout prevention, but should include structured support on re-entry in school, subsidised or school-based childcare, targeted academic catch-up support for learners who fall pregnant and return, and ongoing support for re-entering learners during transition to tertiary education, as the gap between dropouts and those who return to school increases throughout the school cycle, and the earlier learners fall pregnant, the heavier the long-term consequences of pregnancy and childbirth. This study did not statistically control for potential confounding factors, such as household socioeconomic status, prior academic performance before pregnancy, and school-level resourcing, that may independently influence both the likelihood of pregnancy and subsequent academic outcomes. The magnitude of the gaps reported here should therefore be interpreted as descriptive associations rather than as isolated effects of

pregnancy alone. A further limitation is the retrospective, cross-sectional reconstruction of progression indicators; a prospective longitudinal design following a single cohort from Form 1 to Form 4 would allow the attrition cascade identified here to be verified directly over time rather than inferred from cross-cohort comparison. These findings describe the attrition cascade and timing gradient as they were observed in this single-county sample and should not be generalized beyond Kilifi County without further evidence. Whether a comparable cascade and timing gradient exist in other Kenyan counties, or more broadly in coastal East Africa, remains an open empirical question that future comparative and longitudinal research across multiple counties would need to establish.

Ethical Approval

Ethical clearance for the larger study was secured from the Egerton University Institutional Review Board (IRB) and the National Commission for Science, Technology and Innovation (NACOSTI), also from the Office of the County Commissioner and County Director of Education, Kilifi. All adult participants gave informed written consent. If a participant was under 18 years of age, informed consent from the parent/guardian and minor consent from the participant was obtained as well as maintaining confidentiality during data collection, storage and analysis by using anonymous identifiers.

Conflict of Interest

The author declares no conflict of interest.

Data Availability Statement

Data on which this article is based are not public. Responses to detailed surveys and interviews of minors as well as from adolescent mothers on a sensitive issue, pregnancy history, school attendance, and contextual detail from a pre specified set of 28 schools were obtained through informed consent and assent from both minors and their mothers, with no consent or assent given for open public deposit; in the small, definable school communities studied, some contexts may be re-identifiable if the data were to be released unrestrictedly. The data will be kept securely by the corresponding author and provided to any reasonable requestor on reasonable conditions related to data sharing agreement and additional ethical clearance to ensure participant confidentiality as per ethical clearance granted for the study.

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