

The impact of a school-based menstrual and reproductive health intervention on education and health outcomes of adolescent girls in Kilifi, Kenya

Background

The onset of puberty and menarche is a specifically vulnerable time for girls, during which they begin to show interest in the opposite sex, while becoming exposed to a myriad of external pressures, including sexual coercion or harassment from boys and men, expectations to marry from their families, and the need to perform well in primary school in order to qualify for secondary school (Sommer, 2011). According to several qualitative studies in Africa, such pressures are exacerbated by girls' lack of knowledge of their bodies, their rights, and the implications of their decisions, and by their inability to manage puberty and adolescence safely and comfortably with appropriate menstrual hygiene management (MHM) products (Sommer, 2009; Mason et al, 2013; Tigegne and Sisay, 2014; Crofts and Fisher, 2012).

While several programs have previously been developed to address girls' MHM needs in Kenya, as well as globally, few have been rigorously evaluated, and where evidence does exist, the results have been mixed. The government of Kenya, in response to girls' MHM needs has committed to sanitary pad distribution in government schools, however, evaluations have shown that the supply chains of sanitary pads to government schools were not reliable, and girls were not assured of equitable pad provision (Girod et al, 2017).

A systematic review of the literature on MHM concluded that while there is some evidence on the impact of MHM on psycho-social outcomes, the impact on health outcomes is unclear. Furthermore, they noted a lack of quantitative evidence on the effects of MHM on reducing school absenteeism (Sumpter and Torondel, 2013). A second MHM systematic review synthesized the evidence on the effects of MHM interventions on educational and psychosocial outcomes for women and girls in low and middle income countries, and while they outlined two dominant types of MHM intervention approaches: products, or the provision of physical objects useful for MHM, such as menstrual cups or sanitary pads; and empowerment, or the provision of human and social capital through education and non-tangible benefits, they concluded that while there are some indications of positive results, insufficient evidence exists to determine the effectiveness of MHM interventions (Hennegan and Montgomery, 2016).

The evaluation of the Nia Project is aiming to address that gap in the literature. The intervention is being implemented in Kilifi County, in the Coastal region of Kenya, which was identified as the study site based on a review of indicators related to education and reproductive health; for example, the low transition rate from primary to secondary school, recorded as 40% in 2010, compared to the national rate of 72% (MoEST, 2012). In addition, Kilifi was ranked 36 out of 47 counties in regards to the Net Enrollment Rate for secondary school for boys and girls, which was only 26% in 2014 (MoEST 2014). According to the 2014 Kenya Demographic and Health Survey (KNBS, 2015), approximately 22% of girls between the ages of 15 and 19 in Kilifi County had begun childbearing, compared to the national average of 18%.

Using a cluster randomized controlled trial (RCT) research design, this evaluation is one of the first to analyze the individual and combined contributions of school-based provision of sanitary

pads and comprehensive reproductive health education on girls' schooling and reproductive health outcomes. The main objective of the research is to answer the following question: What is the effect of an MHM intervention combining empowerment (reproductive health education) and products (sanitary pads) approaches on girls' well-being (social, and personal competencies) and education, versus empowerment or products alone? The study was specifically designed to address key limitations of previous studies, which include small sample sizes, inability to determine causation, non-random assignment to study arms, and short follow-up periods.

Methodology

The Nia Project was implemented over a period of 5 school terms, from May 2017 to October 2018, with girls enrolled in Class 7 in January 2017. The intervention included two components: 1) sanitary pads and 2) reproductive health education. Under the sanitary pad component, each girl received one Nia Teen brand packet of 10 disposable sanitary pads each month, for the entire project period. Project beneficiaries also received two pairs of underwear at the start of the intervention, and an additional pair at the start of each subsequent term. Under the reproductive health education component, girls participated in a 25-session Nia Yetu curriculum delivered by trained facilitators via five meetings per term of their Nia club, held during time allocated for extra-curricular activities in school. In addition, girls received a Nia Teen magazine, distributed at the start of each term for the five-term period. Each issue corresponded directly to the topics covered in each module of the Nia Yetu curriculum that term.

The design for the evaluation of the Nia Project is a longitudinal, cluster-randomized controlled trial. Data collection included baseline and endline surveys covering socio-demographic characteristics, education participation and engagement, social assets (i.e., friendship networks, self-esteem, trusting relationships with adults), self-efficacy, decision-making, financial literacy, menstruation, reproductive health knowledge, gender norms, sexual behavior, gender-based violence, literacy, mathematical assessments, and cognitive testing, as well as a baseline school quality survey, qualitative data collection, and school attendance tracking. The study involves 140 public primary schools (35 schools per arm; 25 girls per school) in three rural sub-counties (Magarini, Kaloleni and Ganze) of Kilifi County in the Coastal area of Kenya. Before program implementation, the schools were stratified by sub-county and randomly assigned to one of the following four study arms: 1) control group; 2) sanitary pads; 3) reproductive health education; or 4) sanitary pads + reproductive health education. For more details on the study design see Muthengi and Austrian (2018).

Baseline data was collected between February and May 2017 from a total of 3,489 girls enrolled in Class 7 in the 140 study schools. School attendance data was collected for twenty consecutive school days in the second, third and fourth terms of the intervention by data collectors who visited the school and confirmed physical attendance of the students. Endline data was collected between November and December 2018 from 3,276 girls from the initial cohort, for a follow-up rate of 94%. A follow up survey was conducted between February and April 2019 with girls who had completed Class 8 at the time of the endline (n=2,484) to confirm secondary school enrollment.

The primary analysis followed an intent-to-treat (ITT) approach to assess the impact of each of the three intervention arms relative to the control arm on a series of outcomes. The ITT is defined as girls in schools randomized to a specific arm, regardless of girls' actual participation in the

interventions. For outcomes that were measured both at baseline and at endline, the ITT impact was assessed with difference-in-differences (DID) estimated using linear regressions with girl-level fixed-effects. For outcomes that were not measured at baseline, the ITT impact was assessed with linear regressions for the endline outcomes. All regressions were estimated with robust standard errors clustered at the school level. For each regression, Wald tests were performed to test for equality of coefficients to assess whether the effects differed between the following arms: (i) pads + RH and pads alone, (ii) pads + RH and RH alone, and (iii) pads alone and RH alone.

Results:

The mean age at baseline was 14.4 and there was no differential attrition by arm from the sample. On education outcomes, no effects were observed for any of the three intervention arms on mean number of days attended school, primary school completion exam (KCPE) scores or transition to secondary school. On menstruation outcomes, girls in the pads + RH and pads only arms were more likely to have enough pads to manage their period (ITT coefficient (coeff.) 0.249, $p < 0.001$; coeff. 0.282, $p < 0.001$) relative to the control. On RH knowledge outcomes, girls in the pads + RH arm had higher pregnancy knowledge (coeff. 0.223, $p = 0.003$), girls in both the pads + RH and the RH only arm had higher STI knowledge (coeff. 0.266, $p = 0.002$; coeff. 0.237, $p = 0.008$) and there was no effect on HIV knowledge for any of the three intervention arms relative to the control arm. Girls in the pads + RH and the RH only arm had increased positive attitudes on menstruation (coeff. 0.853, $p < 0.001$; coeff. 0.633, $p < 0.001$), more equitable gender norms vis-à-vis marital relationships (coeff. 0.283, $p = 0.018$; coeff. 0.276, $p = 0.019$), adolescent heteronormative behavior (coeff. 0.400, $p = 0.001$; coeff. 0.390, $p = 0.003$) and the sexual double standard (coeff. 0.372, $p < 0.001$; coeff. 0.407, $p < 0.001$). Girls in the RH only arm had a higher mean score on the generalized self-efficacy scale (coeff. 0.848; $p < 0.001$) relative to the control arm. There were no effects for any of the three intervention arms on acceptability of IPV, ability to engage in school, or feeling of competence in the school environment relative to the control. See Table 1.

Discussion:

The results from this study suggest that a well-implemented, comprehensive reproductive health education program, which includes content on puberty and menstruation, is well placed to address some of the gaps that girls have vis-à-vis lack of knowledge, low self-efficacy, feelings of shame around menstruation and inequitable gender norms. It also suggests that the regular distribution of sanitary pads helps girls to be able to better manage their menstruation. However, it also suggests that while girls still retain their right to properly manage their menstruation, sanitary pads alone will not improve education outcomes. Therefore, it is important for the distribution of sanitary pads to be framed as a rights intervention as opposed to an education intervention. Given that economic barriers appear to be the most common reason girls are not transitioning to secondary school, a wider approach to addressing girls' education challenges will likely be necessary.

Further analysis using a treatment-on-the-treated approach to assess a potential dose-response and interactions to assess potential differential effects of the intervention on different sub-populations of groups (e.g. low v. high socio-economic status or behind v. on track in schooling) will be conducted and discussed in the full paper.

Table 1. Endline Results using fixed effects and simple regressions

	Pads + RH Arm	Pads Only Arm	RH Only Arm
	ITT Coef	ITT Coef	ITT Coef
	(p-val)	(p-val)	(p-val)
Mean number of days attended school (0-60), observed [~]	0.584 (0.198)	-0.043 (0.944)	-0.028 (0.960)
Mean KCPE score [~]	3.568 (0.651)	2.734 (0.725)	-3.345 (0.682)
Enrolled in secondary school, % [~]	0.002 (0.959)	-0.010 (0.768)	-3.345 (0.682)
Has enough pads to manage period, % [*]	0.249 (0.000)	0.282 (0.000)	0.058 (0.175)
Mean pregnancy knowledge score (0-4) [*]	0.223 (0.003)	-0.139 (0.055)	-0.077 (0.312)
Mean STI knowledge score (0-4) [*]	0.266 (0.002)	-0.079 (0.339)	0.247 (0.008)
Mean HIV knowledge score (0-11) [*]	-0.130 (0.303)	-0.221 (0.132)	0.006 (0.965)
Mean menstruation attitudes score (0-12) [*]	0.853 (0.000)	0.156 (0.230)	0.633 (0.000)
Mean gender norms – marital relationships score (0-9) [*]	0.283 (0.018)	-0.011 (0.928)	0.276 (0.019)
Mean gender norms – adolescent behavior (0-12) [*]	0.400 (0.001)	-0.103 (0.462)	0.390 (0.003)
Mean gender norms – sexual double standard (0-5) [*]	0.372 (0.000)	-0.007 (0.942)	0.407 (0.000)
Mean general self-efficacy score (0-10) [*]	0.345 (0.090)	-0.206 (0.251)	0.848 (0.000)
Mean schooling engagement score (0-7) [*]	0.061 (0.590)	-0.029 (0.799)	0.134 (0.184)
Mean schooling competence score (0-8) [*]	0.036 (0.720)	-0.116 (0.209)	0.158 (0.107)
Mean acceptability of IPV score (0-5)	-0.009 (0.948)	0.016 (0.916)	0.057 (0.695)

* Difference in difference coefficients

[~] Simple difference coefficients