Sanitary Pad Interventions For Girls Education in Africa- A Pilot Study

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Abstract
Purpose: A pilot study was conducted in Ghana to assess the role of sanitary pads in girls’ education.
Subjects: A sample of 120 schoolgirls between the ages of 12 and 18 from four villages in Ghana participated in the study.
Methods: A non-randomized trial of sanitary pad provision with education. The primary outcome was school attendance. The intervention phase had three levels of treatment: provision of pads with puberty education; puberty education alone; and control (no pads or education).
Results: After 3 months, providing pads with education significantly improved attendance among participants (lambda 0.812, F(6,186)=3.40, p=.003) recovering 9% of their school days. After 5 months, puberty education alone improved attendance to a similar level to that in sites where pads were included in the intervention.
Conclusion: These promising results from this low-cost rapid-return intervention suggest that a large-scale cluster randomized trial is warranted in view of the considerable development needs of poorer countries and the potential of young women there.

Background
The positive links between female educational achievement and several measures of national wellbeing in underdeveloped countries have been well demonstrated. Education predicts better economic productivity for women. Furthermore, higher levels of education are also strongly correlated to key public health measures, including infant and maternal mortality, child nutrition, early pregnancy, and fertility rates. Of interest are the rapid reductions of fertility rates that seem to result from increased schooling for girls. Population growth has profound implications for economic wellbeing, social stability, and environmental protection. Since the education acquired by girls is thought to have a significant impact on a community’s future, their achievement is important on an absolute level. Thus, interventions that positively affect girls’ enrolment and retention in schools are of keen interest in several policy arenas and academic disciplines, particularly where the betterment of poor nations is the focus.

While positive outcomes resulting from primary level education are substantial, when the impact of secondary schooling is considered, the magnitude of the outcomes is even greater. Importantly, addressing factors that compromise attendance and performance throughout the girl’s school career, may have far reaching implications for public health and development. A complex set of factors, involving gender norms and family practices, appear to be at work. These are known to include favoring investment in the male child, birth order, sexual activity, and arranged marriages.
Culturally, the very event of menarche may signal to family and community that a girl is ready to be married and/or to become sexually active, thus reducing her chances of staying in school. This tends to be coincident with the transition from primary to secondary education. Given the seeming salience of marriage and sexuality, and its timing with menarche, the possible role of menstruation itself as a barrier to, or negative influence on, schooling has recently become of interest\(^9,10,11,12\) Furthermore, practical concerns have emerged about the way basic amenities, such as poor toilet facilities, may impede menstruating schoolgirls.\(^9,13,14\)

Observational studies exist that consider the socio-cultural implications of physical maturation and menstruation at an individual level, including taboos, myths, puberty rites, household responsibilities and marital timing.\(^15,16,17,18\) These issues may all have a bearing on girls’ school attendance. Some studies have directly observed this from self-report measures.\(^9,17,18\) However, this research has not been used to develop interventions to mitigate any negative effects that the sociocultural values related to puberty may have on girls. To date, NGO efforts have tended to focus on labor-intensive, long-term programs, aiming to change views about the benefits of female education.\(^19,20\) High quality evidence of the efficacy of programs such as these is currently lacking. Since the public health, population, and economic benefits of female education are thought to occur within less than one generation,\(^21\) a short-term intervention with rapid impact of pad provision with education for girls might be useful. This intervention might be expected to operate at multiple levels within an Ecological model of change.\(^22\)
Figure 1: Ecological model of change as applied to menstruation and education

There are background Macro level obstacles to women’s education more generally such as gender norms, poverty, the physical environment and the lack of availability of sanitary pads in low and middle income countries. The Intermediate level poses more specific obstacles to school attendance including long distances between home and school and a lack of adequate and private toilet facilities there. The intervention at the proximate level, aims to reduce shame, embarrassment and stereotypes as well as responses such as using unsuitable materials for menstruation or staying at home. Outcomes are then measured at the Individual level and the primary one being attendance. To add greater understanding to this theory of change, qualitative investigations were also conducted which will be reported elsewhere.23

This paper follows reporting guidelines laid down by the TREND Statement and the project is consistent with the MRC Framework for development and evaluation of RCTs for Complex Interventions to Improve Health.24,25

Aims
This study aimed to investigate the relationship between the availability of (1) sanitary pads-and-education and (2) education alone, on school attendance among girls aged 12-18 in Ghana.

Hypotheses
1. The provision of Pads-with-education will improve attendance among menstruating schoolgirls.
2. The impact of the intervention will vary according to geographical location and associated levels of poverty. Rural areas will have better attendance rates than peri-urban areas upon provision of Pads-with-education.
3. Education about puberty and menstruation alone will not be sufficient to improve attendance at schools.

Methods

Research was conducted in two phases:

Phase I: Feasibility and Development

This phase was a preliminary study to assess whether menstruation was indeed a barrier to education and to assess feasibility for the subsequent intervention phase. The researchers gathered information on local beliefs and practices concerning menstruation as well as cultural and infrastructural issues that could hinder school attendance for menstruating girls. Information was collected concerning how and from whom girls learned about menstruation; how girls managed their menses at home and in general; how well these methods worked at school; and the availability and quality of the toilet facilities in schools.

In late 2008/early 2009 with participation from local governmental and non-governmental organizations, research teams from Oxford went into the field. Semi-structured interviews with girls, parents, and teachers were conducted, to understand conditions in the schools, and to discuss the provision of sanitary care with education and health officials. All interviews were held in the relevant local language, with NGO staff providing interpretations into English. Fieldwork encompassed both Christian and Muslim populations in villages in both periurban and rural settings: Accra, as well as the Western, Central, Upper East, and Ashanti regions. Approximately 200 individuals drawn from each of the subject groups—girls, teachers, and parents—were seen through a combination of individual interviews, focus groups, and small community meetings.

Phase II: Piloting and Evaluation

Recruitment

Schools for the intervention were selected in collaboration with our NGO partners based on the criteria of having sufficient school population, a gender disparity in school enrollment, community acceptance, and enthusiastic support for the project. The periurban sites were selected to be comparable in terms of population density and economic development. The rural site was markedly less developed as the term usually suggests. Girls aged 12-18 in each school were referred by teachers to the study and pre-menarcheal girls were excluded. No girls declined participation.

Table 1: sites, interventions, timing and materials.
Intervention

The intervention had three levels of treatment each of 5 months duration:
1. provision of pads with puberty education (two sites)
2. puberty education alone
3. control site which received no pads or education (see table 1).

In each site there was a primary school and a junior secondary school. Girls in Pad-with-Education treatment sites were provided one pair of underwear in the event that they did not own any and twelve pads per month for the duration of the study. All participants received a daily calendar to record their menstrual cycles, as well as a pencil and sharpener. The educational component consisted of puberty education including information regarding the development of secondary sex characteristics, the biological process of menstruation, and an explanation of how pregnancy occurs. Hygiene and menses management were discussed and in treatment sites that received pads, girls were given instructions and demonstrations on how to use and dispose of the sanitary pads. Education was delivered in the local language at all three active intervention sites during school hours to groups of 15-25 girls by trained research assistants. These sessions were based on the curriculum used by the Ghana Education Service and was complemented with material from the Commonwealth Secretariat and Healthlink Worldwide 'Gender and Relationships Handbook' which enabled consistent delivery. Schools were offered incentives to participate valuing 250USD each. This money was spent on study-appropriate goods. In one case toilet doors were purchased and installed. In another desks were repaired, and in a third, a water catchment system was installed. A school with no electricity had hand-crank flashlights provided.

Context

Three sites were peri-urban villages in the Central region. These sites were considered to be ethnically, economically and culturally typical of peri-urban villages in the region. Results from Phase 1 had indicated that religious affiliation was not a key determinant in the factors under study and that other considerations were more important. In addition to the three main peri-urban sites, one Pads-with-Education treatment site was conducted at a remote rural location in the Ashanti region. This site was selected specifically because of its extreme remoteness; the location had no electricity, water, or paved roads, and no previous experience with sanitary pads.

Measures

Attendance was chosen as the primary outcome as school performance data were hard to interpret across sites and grades. It is also likely that attendance acts as a suitable proxy measure for performance.

Teachers recorded their attendance daily as usual. Researchers collected attendance records dating from September 2008 to 2009. These dates captured 2 whole terms (1 term = 65 days) and one half term. Researchers compared official attendance data with actual student attendance at every site visit (planned and
unplanned) and found negligible differences indicating strong reliability of the school attendance data.

Girls were provided with daily calendars and pencils with which to record their menstrual cycles and pad use. These data enabled researchers to assess the uptake of the intervention and implementation. Demographic data were collected and the girls were asked to report the time taken to walk to school and basic information concerning their menstrual history. An age-appropriate, culturally relevant poverty index was constructed to capture the multiple dimensions of poverty. Because accurate data on income and expenditures are difficult to obtain in a developing country context, an index of girls’ material wellbeing was constructed using Asselin’s indicators of household financial poverty that included ownership and/or access to common durable consumer goods (e.g. car, radio, TV, and phone); economic capital (land, livestock and income); water and sanitation (e.g. latrine at home); and the proximity of home to markets (i.e. distance to roads, shops, clinic, market). We also drew from the Oxford Poverty and Human Development Initiative to capture noneconomic dimensions of girls’ poverty, including wellbeing measures such as health; agency/empowerment; security (physical safety); shame; and subjective wellbeing. The latter measures have been found to be particularly accurate in research on adolescent and child health.

Results

This was a three-armed study which tested a sanitary Pads-with-Education intervention versus education only versus no-intervention control for schoolgirls in Ghana to assess changes in school attendance. The mean age across the entire sample (n=120) was 15.7 years (sd 1.59); this did not significantly differ between sites (H= 1.064 df=3 p= 0.786). The average age of menarche was 14.08 (sd 1.91) and again did not differ between sites (H= 4.73 df= 3 p= 0.192). All girls spoke either Twi or Fante and were all Christian, with the exception of two Muslim girls. The mean time distance to school was 0.6 hours (sd 0.55). There was a significant difference between sites (H= 32.137 df= 3 p<0.001) with the rural site having the longest time distance (1.3h sd 0.8). Other sites were between 0.3 and 0.6 hours. The Poverty Index Scores also varied significantly across sites (H= 28.536 df=3 p<0.001) with the rural site being the most impoverished (mean 2.67 sd 1.24) and the other sites between 3.68 and 5.2). The following analysis included only girls who had attendance records for all three of the time periods measured. After excluding participants with missing attendance data, there were 98 girls included in the attendance analysis (see figure 2).
Figure 2. Participant Flow Chart

In general, attendance rose in the Pads-with-Education groups by around 6 days per 65-day-term (or 9% of a girls’ school year). In the Education-Only group, initially, attendance did not change but at 5 months it rose to similarly high levels. There were few differences in attendance between active intervention sites and, in this respect, the rural site did not differ from its periurban counterpart.
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Graph 1. Percentage change in attendance by group over time

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Location</th>
<th>Pre intervention attendance mean percent (SD)</th>
<th>Midpoint of intervention attendance mean percent (SD)</th>
<th>Post intervention attendance mean percent (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pads-with-Education (n=32)</td>
<td>Periurban</td>
<td>82.27 (28.05)</td>
<td>90.58 (11.20)</td>
<td>90.93 (19.21)</td>
</tr>
<tr>
<td>Pads-with-Education (n=17)</td>
<td>Rural</td>
<td>80.68 (14.73)</td>
<td>91.91 (5.41)</td>
<td>91.09 (9.06)</td>
</tr>
<tr>
<td>Education only (n=22)</td>
<td>Periurban</td>
<td>78.03 (26.25)</td>
<td>78.96 (19.70)</td>
<td>91.36 (8.31)</td>
</tr>
<tr>
<td>Control (n=27)</td>
<td>Periurban</td>
<td>88.43 (13.44)</td>
<td>82.14 (13.62)</td>
<td>83.21 (13.91)</td>
</tr>
</tbody>
</table>

Table 1. Percentage attendance across sites over time

Pre-intervention attendance at baseline did not vary between groups (F= 1.508, df=3, p=0.216). The changes in attendance were found to be significant by
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site over time. Using PASW, a mixed between-within subjects analysis was conducted to assess the impact of the interventions at four sites (Pads-with-Education Rural, Pads-with-Education Periurban, Education-Only, and Control) on participants’ absenteeism, across three time periods (pre-intervention, midpoint of intervention, post intervention) Wilk’s lambda=.81, F(6,186)=3.40, p=.003. Similarly, when analyzed within subjects by site over time, this positive result is further supported Huynh-Feldt F (5.21,155.78)=3.31, p<.01. The partial Eta squared for time was .084, suggesting a moderate effect size. To attempt to assess rural-urban differences, two sites tested Pads-with-Education, one markedly rural, isolated, and lacking basic amenities, the other periurban. Attendance results did not differ between sites (t=1.34, df=65, p=.186).

Discussion

This is the first intervention study to assess the efficacy of sanitary pads with education for school attendance among menstruating students in Africa. Previous research in this area has been entirely observational and thus the results of this pilot study are of interest to the research and international development community. The results suggest that provision of Pads-with-Education may be beneficial to improve attendance and the life chances of these young women. However, interestingly, Education-only also appears efficacious albeit with a delayed effect. Whilst this is only a pilot study, the overall patterns from this work indicate that further rigorous investigation is warranted.

In accordance with the Ecological model, intermediate factors such as a longer distance from home to school, greater levels of poverty, and lack of water and toilets typical of rural areas are likely to make school attendance during menstruation more difficult. Thus, a greater effect at an individual level at our chosen rural site was predicted. However, girls at the rural site appeared to benefit to approximately the same degree as those at the periurban Pads-with-Education site. Based on these findings, it would seem that this intervention could be applied in a wider range of levels of urbanization. It may also be the case that these similar results suggest that the degree to which menstruation acts as a barrier to education is more closely related to cultural than geographical dynamics.

At the Education-only site girls received the same educational material as at the Pads-with-Education sites except that they were not instructed on sanitary pad management. The effectiveness of this minimal intervention was delayed but produced similar results to that of Pads-with-Education. That is, at a proximal level, it may be that the education component is the active ingredient across both interventions. Providing the girls with information and allowing discussion of this taboo subject may address factors at the interpersonal level of the ecological model.
such as management of cloth materials that enabled girls to better manage their periods, which perhaps resulted in increased school attendance. Alternatively, we may speculate that educating the girls in groups on this topic fostered improved peer and other relations making the school environment more supportive and in turn delivering the results presented here. Future research may consider study designs containing a “pads only” group in order to separate this effect from education.

Generalizability of these data may be limited in view of the sites chosen, and population selected. However many of the features and problems faced here are common to sub-Saharan Africa and it is likely that this intervention would be worthy of testing elsewhere. The sample may have some selection bias in that participants included only those who were attending school despite menstruating, and thus had some basic internal and external resources in order to do so. Furthermore, we selected only students who had complete attendance records for three consecutive terms to provide comparative baseline data. It is possible that girls unable to fulfill this condition would be even more responsive to an intervention such as that presented here. Had they been included, we would expect that the effects of the intervention would have been greater.

Other limitations of this study include the small sample size and short follow-up time. This sample of 120 girls provides a reasonable pilot to begin to assess the issue of menstrual management and educational attainment. The short-follow-up time unfortunately does not allow us to determine the long-term effects of such an intervention. Acceptability of the intervention was not specifically tested in this protocol analysis. However, qualitative data suggest that the girls found the education component of the intervention enjoyable and helpful, and there was no loss to follow-up for compliance reasons. A further consideration is that this intervention has cost implications and whether it is sustainable to scale is a long-term question for future studies. Nevertheless, for such pressing social, health and economic needs, these promising results require a well-conducted cluster randomized trial to assess the efficacy of pads and education for attendance and performance.

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