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Advancing Gender Equality and Educational Access through Community-Driven Researched Initiatives in Ethiopia

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ABSTRACT
This article examines the intersection of research, activism, and education through a case study of Education-4-Change's work in Ethiopia's Somali Region. Focusing on gender equality, educational access, and community-driven initiatives, the study frames research as both analytical and activist. Situated within the context of the UN Sustainable Development Goals, it addresses the structural barriers—such as poverty, gender norms, political instability, and environmental crises—that shape Ethiopia's educational landscape. Using sociocultural, community-based, and participatory methods, including engagement with local councils and outreach workers, the research highlights how localized strategies and quantitative data can amplify marginalized voices and shift intervention priorities. Special attention is given to how menstrual hygiene management (MHM) and gender-responsive education promote equity for girls, underscoring the need for intersectional, long-term approaches to educational development.

KEYWORDS
Gender equality; educational access; menstrual hygiene management; Ethiopia; community-based research.

INTRODUCTION

Education is a fundamental human right. This right is not only for individual empowerment, but also for national development and peacebuilding around the world. In Ethiopia, the educational landscape is complex and shaped by historical instability, political challenges, climate-induced crises, and entrenched cultural barriers (Devall-Martin & McHolm, 2024). Within the Somali Region of Ethiopia, Education 4 Change (E4 Change), an international not-for-profit organization, integrates scholarly inquiry with intentional advocacy and community-based action to address barriers prohibiting girls from attending school. Our form of research activism transcends a technocratic process by engaging community leaders, actively recognizing inequities and injustices, and implementing context-specific social changes. This is referred to as a Social Behavior Change Communication strategy (SBCC). As an evidence-based and community-centric strategy, SBCC positively influences individual and collective behaviors through communication, to address the social, cultural, and structural factors that influence behavior with the goal of improving health, social outcomes, and well-being (Dearden et al., 2023; Handebo et al., 2024). SBCC goes beyond simply sharing information but fosters motivation by cultivating supportive environments that enable change. By weaving SBCC throughout all projects, E4 Change moves beyond simply identifying systemic issues and providing band-aid solutions to actively empowering communities to challenge norms, adopt inclusive practices, and drive lasting social change through research-informed, action-oriented communication. This synergy makes research activism both accessible and transformative.

All E4 Change initiatives, including the menstrual hygiene management (MHM) kits distribution with education program called *Erase the Stigma for Good (2024),* exemplify the use of SBCC strategies by using education as a vehicle for a community-driven and inclusive programming in order for “education to play a fundamental role in creating a just and democratic society” (Nouri & Sajjadi, 2014, p. 76). Specifically, the three-phase program aims to address the identified barriers for girls' continuation in school in the Somali Region of Ethiopia. Providing reliable and reusable menstrual hygiene management (MHM) kits with education and support is expected to allow girls to continue with their daily activities without hindrance especially during menstruation. Simply put, providing the support necessary to increase educational opportunities for girls through this program will lead to better outcomes for all in the communities.

Through the first phases of this program (December 2024; March 2025), the E4 Change team demonstrated that research can be a powerful tool for global social transformation by bridging the gaps between resource gathering, distribution, knowledge sharing, and community empowerment.

Intersectionality and activism in education: A global perspective

Education is a cornerstone of human development and is recognized globally as a core tool for achieving the Sustainable Development Goals (United Nations, 2015). However, the intersectionality of factors, such as gender, disability, socioeconomic status, and geographic

location, often dictates the extent to which individuals can access and benefit from educational opportunities (Devall-Martin & McHolm, 2024).

Intersectionality, which originates from Crenshaw (1989), is a theoretical framework that examines how various social identities intersect to create unique modes of discrimination and privilege. In the context of education, intersectionality helps understand how overlapping identities, such as being a rural, low-income, disabled, and/or gender, can compound barriers prohibiting access to quality education. For instance, a young girl with a disability in a rural Ethiopian community may face multiple layers of exclusion, including gender-based discrimination, a lack of accessible infrastructure, and limited educational resources. Goal #4 of the 17 Sustainable Development Goals (SDGs), outlined by the United Nations 2030 Agenda, explicitly focuses on ensuring inclusive and equitable quality education, and promoting lifelong learning opportunities for all. Achieving this goal necessitates addressing the complex barriers that hinder marginalized groups from accessing education. Intersectionality provides a lens through which these barriers can be identified and addressed, thus ensuring equitable access to education.

Ethiopia presents a microcosm of global challenges related to the intersectionality of education. Despite significant progress in expanding access to education, disparities persist, particularly among girls, students with disabilities, and rural communities. In the Somali Region of Ethiopia, the number of girls in schools and staying in school is declining (Ministry of Education, 2022/23). Factors contributing to this trend include early marriage, and cultural norms that prioritize boys' education, along with inadequate school facilities that are not conducive to meeting girls' needs (Iyer et al, 2020). A study by the British Council's CRADLE Training and Research Centre (2023) highlighted that many schools lack gender-responsive policies and inclusive practices, leading to hostile environments for female students.

Recognizing the need to address these intersecting challenges, Ethiopia has developed various policies to promote inclusive education. *The Education and Training Policy* (ETP; 2015) and the *Education Sector Development Programmes* (ESDP; 2020) emphasize the importance of special needs and inclusive education. However, the implementation of these policies has been inconsistent, and many students including girls, and those with disabilities, continue to face significant barriers to education (Devall-Martin & McHolm 2024).

Educational Landscape: Somali Region, Ethiopia

The educational system in Ethiopia's Somali Region endures multifaceted challenges that significantly affect girls' access to and retention in school. As outlined in the Ethiopian *Education Statistics Annual Abstract 2023/24* (ESSA; MOE), the region's education indicators are among the lowest in the country. Despite efforts to improve student achievement across the Somali Region, only 0.7% of students scored above 50% on the national exam, compared to the startlingly low national average of 3.3% (p. 55). This low academic performance reflects systemic issues rooted in sociocultural, infrastructural, and socioeconomic barriers, which E4 Change seeks to address based on community-expressed priorities.

Socioculturally, gender inequality is pronounced in the education system of the Somali Region. The gender parity index is 0.76 for primary and 0.75 for middle school, significantly lower than the national index being 0.90 and 0.94, respectively (p. 29). Cultural norms often prioritize boys' education over that of girls, leading to higher dropout rates for girls. Additionally, early marriage and household responsibilities further impede girls' educational attainment.

The lack of adequate school infrastructure exacerbates educational challenges. Further explained in the ESAA 2022/23, the pupil-teacher ratio in the Somali Region is 75.7, well above the national standard of 36.4, leading to overcrowded classrooms and diminished learning quality (p. 30). Furthermore, the region has the lowest access to water, sanitation, and hygiene (WASH) facilities, with only 21.5% of schools having functional water supply systems (p. 54). This scarcity disproportionately affects girls.

These challenges in the Somali Region have direct implications for menstrual hygiene management. Specifically, WASH (Wash, Sanitation, and Hygiene) facilities are gender-specific latrines with access to water to allow for proper cleaning after facility use. The absence of functional WASH facilities within schools limits girls' abilities to hygienically manage their menstruation, leading to absenteeism and, in some cases, dropping out of school. Haybe (2023) indicates that this is evidenced by the 63% decrease in gross enrollment rate between primary (Grades 1-6) and middle school (Grades 7-8). Cultural ideas and a lack of awareness further exacerbate the stigma surrounding menstruation, discouraging and shaming girls from attending school during their menstrual period.

As Canadians, our experiences with education, inclusion, and access to education differ from those that this project intends to impact. In such a social activism project, we focus on and explore the role of females within the Somali Region through the work of E4 Change. We must also recognize that our interpretations need to be filtered through Ethiopian knowledgeable women within our organization to ensure that the interpretations made within this study are grounded in both evidence and cultural knowledge.

Community-based Research Practices

The best practices within SBCC for conducting community-oriented research centers on the knowledge and experiences of marginalized populations in reciprocal ways. E4 Change specifically began with elder-led talking circles to explore what they felt was important to their communities. Each additional community leader was brought into discussions about what they envisioned, what they felt they needed assistance with, and what they felt they could contribute to the project. Communities sought opportunities for themselves to support their children' s learning, and to improve opportunities for employment and empowerment.

Research Questions

This exploratory study discusses the barriers and opportunities as outlined above within the Somali Region of Ethiopia at a grassroots level. Originally funded by USAID, this project lost its funding in January 2025. Due to this change, challenging paths were met with resilience and

commitment by the in-country director and staff in Addis Ababa. The nature of the research project was adjusted based on available resources.

The research questions were as follows:

- What barriers prevent girls from continuing education in the Somali Region of Ethiopia?
- Does gender-based health education and access to reliable feminine hygiene products influence school attendance?
- Did having access to safe, private, sex-exclusive washrooms encourage girls to attend school during menstruation?

These complex questions require in-depth, long-term research commitments. For example, completion of Phase 3 triggered an extension of the project into Phase 4 in order to capture accurate attendance rates over six months. This data is beyond the scope of this paper.

METHODS AND MATERIALS

When conducting a literature review to guide the research, it became evident that no such research has been conducted in this region of Ethiopia. A similar study, *USAID Lowland WASH MHM Management* (USAID, 2018), was completed in another region of Ethiopia, and it was used as a guide for some of the original research underpinnings. Because the contexts of civil unrest, socioeconomic challenges and natural disasters vary within these two regions, direct comparisons cannot be made without caution. The Somali Region with the *Erase the Stigma for Good Project* includes the districts of Jijiga, Shinille, and Godey. Within these woredas, eight schools were selected through matching control and treatment groups. At the time of this writing, the first stage of implementation was completed, with secondary follow-up occurring within two months. Two hundred girls participated in the education and receipt of menstruation hygiene management (MHM) kits, and 150 girls were surveyed in an informal focus group. The two groups' data were analyzed using descriptive statistics, which revealed a uniform distribution across both groups, thereby enabling a direct comparison of the results by the researchers.

Menstrual Hygiene Management (MHM) Kits

In this study, 200 female students were given reusable MHM kits. In partnership with Days for Girls©, the MHM kits were made by volunteers with donated materials and then shipped to Addis Ababa. Each kit is in a draw-string bag and includes reusable cloth menstrual pads made up of colorful shields and liners, panties, a washcloth and soap, a carry pouch for washing and storing, and other items. The kit enables girls to carry their clean and used pads discreetly and to take care of their own hygiene needs for approximately three years. The girls were taught about the female menstrual cycle, reproductive anatomy, and how to care for their MHM pads. Topics of female genital mutilation, sometimes called female gential cutting, and female genital stitching, were also covered, dispelling the belief that these practices protect female virginity. Discussions around school attendance in general, how to manage menstrual flow when attending school, and early marriage were covered. One hundred and fifty female participants

in the control group did not receive the education or MHM kit resources. They will receive both the MHM kits and education as part of a cross-over design in Phase Three of the project.

With E4 Change's country director and program manager overseeing the project, the MHM kits were released from customs in Addis Ababa, and then were transported by truck and distributed in the three locations: Jijiga, Shinille and Godey. Female outreach workers were hired and trained by E4 Change's program manager using the Days for Girls' educational modules.

Questionnaires, Focus Group Discussions and Key Information Interviews

The questionnaires were developed by the research committee including both genders, Ethiopian and International researchers. The questionnaires were reviewed by community-based staff to ensure culturally sensitive topics were covered with care. The same questionnaires were repeated for both control and treatment populations. During the inception of the research project, staff, parents and community members were informed of the opportunity to participate. Key Information Interview participants self-identified and included staff, parents and community members that were directly connected to the student population. Female focus groups were selected based upon interest when the opportunity was discussed as part of their kit use and care education programs.

Due to the sensitive nature of some of the data, great care was taken to maintain anonymity for participants. Appropriate consents were gathered. Participant numbers were assigned rather than using student names. All data connecting identities to assigned numbers were kept in Ethiopia.

To complement the questionnaires, each location additionally conducted Focus Group Discussions (FGD) and Key Informant Interviews (KII) with five additional individuals. In the FGD, students were brought together with a paid female outreach worker to discuss the topics of Female Genital Mutaliation (FGM), barriers to accessing education and how menstruation influences attendance to school. The barriers of menstruation hygiene materials and access to washrooms were also explored. The Key Informant Interviews (KII) were a group of 5 adults within the school setting, including school administrators, outreach workers and teachers. These were performed in each of the three communities in the case study. Ethiopian Outreach Workers and Social Workers conducted the interviews, entering information into the data collection tool. The data was cleaned by researchers in Canada, avoiding any compromise of identity.

Approaches to Analysis

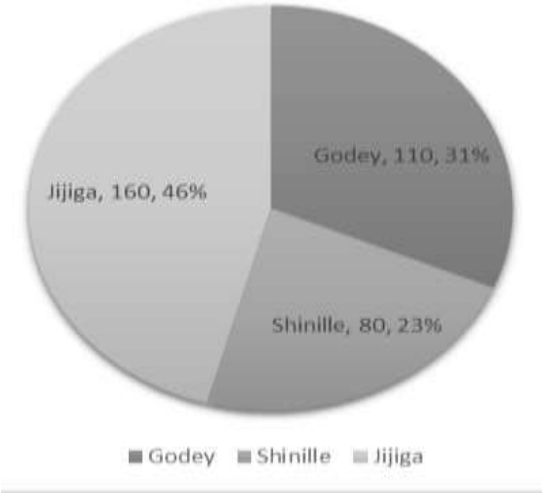
For this exploratory study, a quantitative analysis was conducted using SPSS, Version 28. Thematic analysis was performed, with coding completed manually, by field researchers to guide the development of the secondary questionnaires. This purposeful approach allowed the secondary questionnaires to be both culturally relevant and reflective of the context. These insights allowed us to develop more thoughtful questions that were based on the community's expressed interests and needs.

Control and Treatment Samples

The wealth, economics, education, and geography of a community in Ethiopia impact the cultural norms. The more urban the community is, the greater the access to information, education, and employment opportunities. Acknowledging this is important when exploring the engendered barriers that impact girls' educational outcomes. The 350 participating female student-participants were from three geographic zones within the Somali Region of Ethiopia. Jijiga represented the most urban setting of the three districts and also represented a slightly higher number of participants in the study. Figure 1 indicates the participant percentages by location with 110 females* (*identified as school-age girls) participating in Godey, 80 in Shinille and 160 in Jijiga. They are weighted according to the student population sizes that work with Education 4 Change (E4C).

Figure 1.

Female Participation by Location



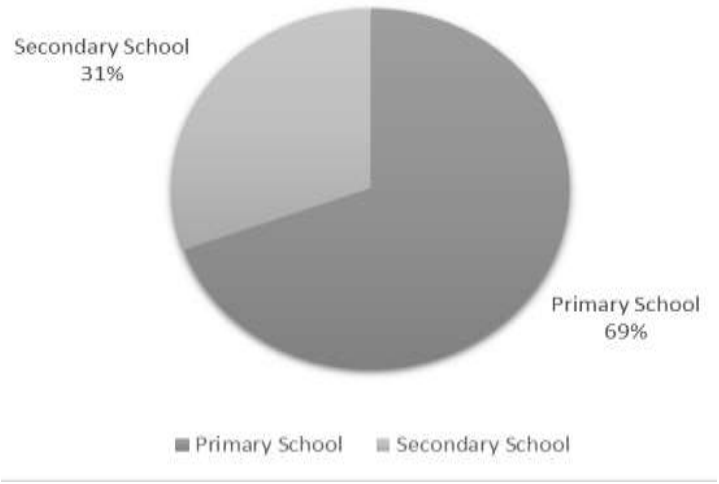
Note. A total of 350 female participants were divided amongst 3 towns.

Additionally, focus group discussions (FGD) were held producing contextual summative reports. These reports, and Key Informant Interviews (KII), complimented the quantitative data. All information was originally collected in the Somali language with trained, bilingual researchers living in Ethiopia, and translation into English is forthcoming.

Equally significant, the data collection spanned across the education system to include both primary and secondary students. Reflective of the contextual realities with fewer female participants continuing their education into secondary school, there was a smaller percentage of these participants in the study with 31 % of the participants being in secondary school and 69% of female participants being in primary school (see Figure 2). The fact that menstruation affects more females in secondary school, it is notable that there are fewer girls in secondary school that were available to participate in this study. This is indicative of education in Ethiopia; girls do not continue their education to the same level of boys.

Figure 2.

Educational Level of the Participants



Note. All participants were currently attending school at the time of the study. n= 350; Primary School participants n= 243, Secondary School participants n=107.

As indicated in Figure 2, 243 female participants were in primary school, and 107 were attending secondary school. No participants were in higher education. The stage of the girls' physical puberty was also included in the research. For the treatment group (those receiving the MHM kits and education), the average age of onset menstruation was 12.5 years with a standard deviation of 1.61. The age of menstrual onset for the control group was 12.4 years with a standard deviation of 1.79 (see Table 1). This is an important consideration because the data highlights a decline in pubescent-aged females attending school. This study is exploring if that is in part, related to their menstruation.

Table 1.

Female Participants' First Menstruation

Age	Number of Female Participants' First Menstruation	Rounded Percentage (%) of Female Participants
Below Age 10	10	2.9
10-12 Years Old	173	49.9
13-15 Years Old	161	46
16 Years or Older	6	1.7
Total	350	100

Note. Similarities in their distribution were found when comparing the control group to the treatment group.

As indicated in Table 2, using a Levene's Test of Equality of Variance, which checks for the variability within groups and compares it to the variance within another group, (control vs

treatment), the two samples had similar results, indicating strong comparable properties. This permits the participant group and the control group to be directly compared with confidence related to factors of onsite age for menstruation.

Table 2.

Test of Equality of Variance Between Control and Treated Group

		F	Sig.	t	df	One-sided p	Two-sided p	Mean	Std Error Difference
Age Standard Deviation	Equal variances assumed	4.607	0.33	.795	348	.214	.427	.145	.182442
	Equal variances not assumed			.783	300.963	.217	.434	.145	.18527

Note. This chart shows 95% Confidence Intervals of the Difference with similar Lower and Upper limits for both groups. (Control Lower = -.2, Upper = .5; Treatment: Lower = -.2, Upper = .5).

Once again, this test of Equality of Variance indicates that control groups (not receiving the kits and education) and those receiving the kits and education, have similar characteristics; thus allowing for comparison with confidence.

FINDINGS AND RESULTS

The Focus Group Discussions (FGD) and Key Informant Interviews (KII) showed consistency through cross-analysis. Menarche (first menstruation) is a topic that is embarrassing to speak about with adults, male family members and girls at school. The majority (≅ 80%) of students involved in the discussion group highlighted that it was difficult to even speak to their mothers or sisters about menstruation. None of them shared with their fathers that they had reached puberty, and they speak of trying to hide this information from others within the household. Sixty percent of participants preferred to stay at home during menstruation, noting a combination of anxiety around leakage and physical discomfort. This information is consistent across the three woredas in the Somali Region (Maalim Mohamed & Saidia, 2024).

Table 3 indicates female participants' perception related to their attendance of school when menstruating. A likert scale was used to describe the impact of menstruation on their school attendance.

Table 3.

Do You Feel that Menstruation Affects Your Participation in School or Work?

			Never	Infrequently	Occasionally	Frequently	Always	Total
Age	10-14 years	Count	22	2	1	0	134	159
		% within 1. Age	13.8	1.3	0.6	0	74.3	100
		% within 20.	38.6	100	100	0	46.4	45.5
		% of Total	6.3	0.6	0.3	0	38.3	45.4
	15-19 years	Count	33	0	0	1	143	177
		% within 1. Age	18.6	0	0	0.6	80.8	100
		% within 20	57.9	0	0	100	49.5	50.6
		% of Total	9.4	0	0	0.3	40.9	50.6
	20-24 years	Count	2	0	0	0	12	14
		% within 1. Age	14.3	0	0	0	85.7	100
		% within 20.	3.5	0	0	0	4.2	4.0
		% of Total	0.6	0	0	0	3.4	4.0
Total		Count	57	2	1	1	289	350
		% within 1. Age	16.3	0.6	0.3	0.3	82.6	100
		% within 20.	100	100	100	100	100	100
		% of Total	16.3	0.6	0.3	0.3	82.6	100

Note. n = 350. This table does not separate the control group from the participants that were receiving MHM kits. This information contains bias due to the self-reporting nature of data collection. Therefore, future research will include direct attendance records to confirm their assumptions.

Table 4 shows no association between these two variables. With the Asymptotic Significance of .653 and .487, this *p* value exceeds the reliability threshold, therefore further research is needed to draw any conclusions. Similarly, the symmetric measures show no association link or statistically significant outcomes.

To assess the association between these variables, age and attendance in school, a Chi-square test was performed. The research was interested to see if younger girls or older girls had a different pattern of school attendance while experiencing their menstruation. In Table 4 no such association was noted.

Table 4.

Pearson Chi-Square comparing Age and Attendance in School during Menstruation

Chi-Square Tests			
	Value	*df*	*Asymptotic Significance (2-sided)*
Pearson Chi-Square	*5.946**	*8*	*.653*
Likelihood Ratio	*7.469*	*8*	*.487*
N of Valid Cases	*350*		

Note. * 10 cells (66.7%) have expected count less than 5. The minimum expected count is 0.4. Further data collection will determine if this relationship changes once girls with MHM kits feel confident in their use and if having washrooms available for use increases.

Seeking clarification in the strength of association between the age and school attendance, a Phi and Cramer's V Tests were performed. As two variables were tested, the Phi finding bears more importance. In Table 5 we see a Phi value of .130 and a Cramer's V of .092. With a testing range of 0 to 1, where 0 indicates no association and closer to 1 indicates a stronger association, these factors are statistically insignificant. This highlights the complexity of factors influencing female student attendance beyond menstruation as outlined above.

Table 5.

Phi and Cramer's V Tests

Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	.130	.653
	Cramer's V	.092	.653
N of Valid Cases		350	

Note. Little to no association is seen between age and attendance of school across control and treatment groups.

The Key Informant Interviews (KII) led to a higher level analysis of thematic barriers. Within the interview group, the school staff felt that schoolgirls' lack of awareness and proper preparedness for their menarche produced significant stress and embarrassment. Their lack of understanding about their cycles, led to unpredictability and could result in soiled clothing (Maalim Mohamed & Alamtsehay, 2025). School staff resoundingly stated that this led to increased absences resulting in a stigmatized learning environment. As one staff member stated, "It was as if their absence made it less socially acceptable for girls to attend school during their menstruation." It was noted, in classrooms where there was a female teacher, a more inclusive and empathetic environment existed. This, they hoped, would show higher attendance rates regardless of the time within a girl's menstrual cycle. The KII aligned with the FGD data indicating how menstruation was directly connected to school attendance. School staff felt that

girls "did not feel equipped to manage their periods, leading to anxiety about soiling themselves in public" (Maalim Mohamed & Alamtsehay, 2025).

Barriers to Attending School

Based upon the likeness of the two groups, general patterns for the entire sample were compared regarding barriers influencing school attendance. Using a five point likert scale with the gradients of *Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree,* participants were asked how barriers influenced their consistent school attendance. The top five barriers are listed in Table 6 with *Strongly Agree* and *Agree* responses. Some explicit realities surfaced, indicating significant barriers for girls to attend school until graduation (Grade 12).

Table 6.

Strongly Agree and Agree, Barriers for Girls to Attend School

Barrier to Attending School	Percentage (%) of Female Participants Strongly Agree/Agree
Household Responsibilities	92
Access to MHM Kits/Menstrual Products	89.4
Access to Latrines/Washrooms (with water)	83.7
Access to Latrines/Latrines (no water)	81.7
Early Childhood Marriages	79.1

Note. This table denotes only the top five categories, with other significant factors requiring additional research.

Other barriers such as natural disasters, post CoVID trauma, lack of psychological support and openness within the community, and peer pressure to leave school/stay in school also presented as notable barriers to school attendance, but did not reach the level of perceived influence as expressed within the top five barriers (see Table 6). Any approach moving forward must address these secondary barriers, but focus on these top five barriers is required to support girls' school completion beyond Grade 6. This study explores two barriers influencing equitable access to education for girls in Jijiga, Shinille and Godey: MHM kits and latrines with water.

Access to MHM Kits/Menstrual Products

Since access to feminine hygiene products is a significant barrier, the Days for Girls© MHM kit and education presented as a significant intervention opportunity. Those that received the kits shared comments that entire households were sharing one kit, and therefore providing multiple kits within a family was helpful. In addition, we examined the number of times a girl needed to change her menstrual protection during the day. This number is important, particularly in circumstances where access to a latrine or washroom may or may not be available. Table 7 compares the treatment group (recipients of MHM kits) and those in the control groups regarding this question. Girls in the region do not have access to manufactured menstrual products, and often use pieces of cloth from discarded clothing or cardboard during their period.

These were often not secured to any undergarments. Consequently, it was assumed that with access to reliable products, girls would use more menstrual products. Girls managing their menstrual flow, without such products, created a level of concern for leakage and embarrassment. We found that girls who have reliable menstrual pads and underwear, did not need to change their pads as often. This confidence in their HMH kit allowed them to stay engaged and in-class more.

Table 7.

How Often Do You Change Your Pad Per Day During Your Period (Control Compared to Treatment)

			1-2 times	3-4 times	5 or more times	I don't keep track	Total
Control group or Treatment	1.00	Count	141	42	16	1	200
		% within 44	70.5%	21.0%	8.0%	0.5%	100%
		% within 10	78.3%	29.8%	59.3%	50.0%	57.1%
		% Total	40.3%	12.0%	4.6%	0.3%	57.1%
	2.00	Count	39	99	11	1	150
		% within 44	26%	66%	7.3%	0.7%	100%
		% within 10	21.7%	70.2%	40.7%	50.0%	42.9%
		% of Total	11.1%	28.3%	3.1%	0.3%	42.9%
Total		Count	180	141	27	2	350
		% within 44	51.4%	40.3%	7.7%	0.6%	100%
		% within 10	100%	100%	100%	100%	100%
		% of Total	51.4%	40.3%	7.7%	0.6%	100%

Note: 1.00 are the female participants with Kits, 2.00 are the control groups.

A Chi-square analysis was performed to confirm this relationship between having reliable, reusable access to feminine hygiene products and the number of times that a girl addressed their menstrual flow in a day as outlined above. Table 8 revealed significant Chi-square test results, indicating that there was a clear connection between the number of pads/cloths changed daily when experiencing menstrual flow.

In this case, Pearson Chi-square is a raw test statistic. Values of 76.2 and 78.9 are testing how much the data deviates from the expected data and show significant deviation from independence. This suggests a positive correlation between the number of times a girl addresses her menstrual flow per day is related to whether she has MHM kits/ reliable feminine hygiene products.

Table 8.

Relationship between Control and Treatment Groups and # of Changes Per Day

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	79.180a	3	< .001
Likelihood Ratio	78.856	3	< .001
N of Valid Cases	350		

Note. The extremely significant p value of < .001.

To further confirm the Pearson Chi-square, a Phi and Cramer's V Test was performed. As seen in Table 9, a strong association was found. Chi-square test results between .3 - 1 are considered a strong association, and results that approach 1 indicate stronger associations. In this case, the results show a moderate to strong association suggesting that the categories are meaningfully related (see Table 9).

Table 9

Phi and Cramer's V Test

Symmetric Measures			
		Value	*Approximate Significance*
Nominal by Nominal	*Phi*	*.467*	*<.001*
	Cramer's V	*.467*	*<.001*
N of Valid Cases		*350*	

Note. The results are considered highly reliable due to the p value of <.001

This indicates a moderate to strong relationship between the number of times a girl changes her feminine hygiene product per day and her confidence with the product. The *p* value of < .001 shows the high statistically significant measure. Therefore, it can be confidently stated that having access to reliable MHM products reduces the number of times per day a girl needs to address her feminine hygiene during menstruation.

Further analysis between control and treatment revealed some unexpected outcomes. In Table 10, the treatment and control groups were separated. Using an Independent Samples Test, the variance between the two groups was not equal. Negative t-values indicated that those with MHM kits were changing their feminine hygiene products less often than those without the kits; to a statistical significance of - 6.3.

The confidence interval being negative (both upper and lower) highlights that those in the treatment group used less pads. And it is because it does not cross zero, this difference is considered statistically significant or reliable data. There is strong evidence that the treatment group used fewer pads per day than the control group. The difference is statistically significant, and we are 95% confident that the true average difference in pad usage is between approximately 0.6 and 1.15 pads less per day for the treatment group. This indicates that the

treatment group had more confidence in their menstrual protection. This confidence could translate into greater attendance in school during menstruation, and attention in class throughout the day.

Table 10.

Comparing Use of Feminine Hygiene Products between Control and Treatment Groups

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Significance One-sided p	Significance Two-sided p	Mean	Std. Error Difference
Equal variances assumed	7.836	.005	-6.268	346	*<.001*	*<.001*	-.87715	.13994
Equal variances not met			-6.398	383.603	*<.001*	*<.001*	-.87715	.13711

Note. Confidence Levels of 95% is achieved with similar Upper and Lower values across groups. Lower = -1.1; -1.2 and Upper -.6 for both variances tests.

Table 11.

Cohen's d and Hedges Correction

Independent Samples Effect Sizes				
			95% Confidence Interval	
	Standardizer*	Point Estimate	Lower	Upper
Cohen's d	1.29175	-.679	-.897	-.460
Hedges' correction	1.29456	-.678	-.895	-.459
Glass's delta	1.18446	-.741	-.968	-.511

Note. *The denominator used in estimating the effect sizes. Cohen's d uses the pooled standard deviation. Hedge's correction uses the pooled standard deviation, plus a correction factor. Glass's delta uses the sample standard deviation of the control group. Confidence levels of 95% were found with Lower limits of -0.9 and Upper limits of -0.5.

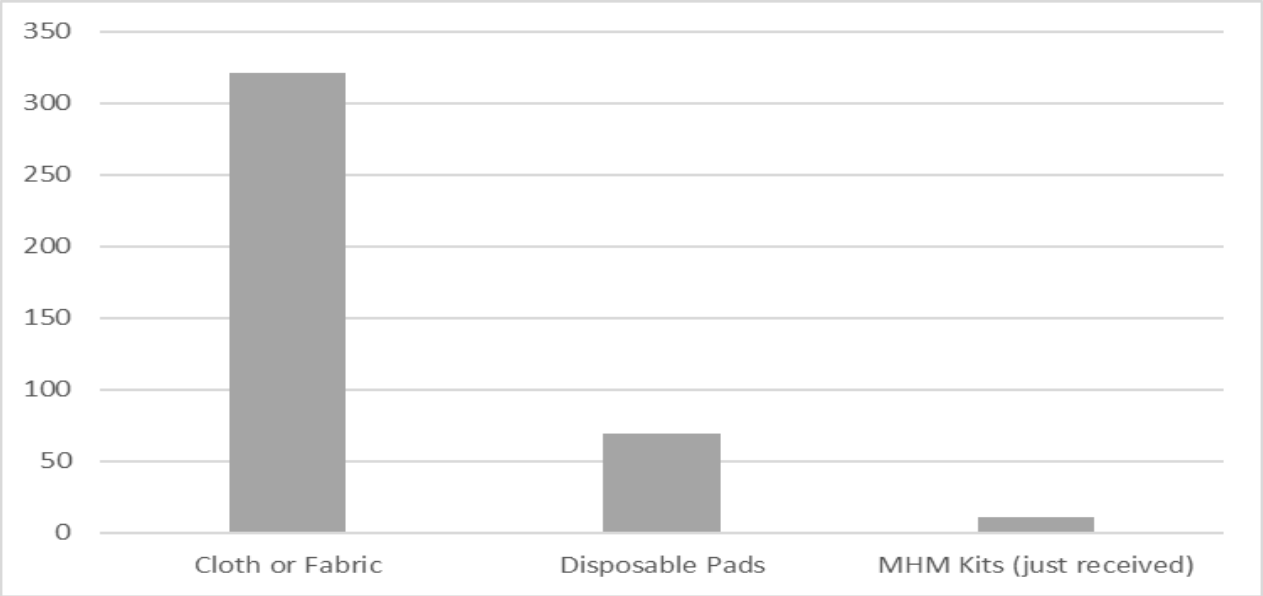
Further confirmation of this finding came through Cohen's d and Hedges Corrections assessments, seen in Table 11. In both cases, Cohen's d and Hedges results also confirm a very large effect size, suggesting a notable difference between the treatment and control groups. The accepted threshold for effect size in these two tests is 0.8. With standard deviations, d = 1.29 in both tests between the female participants and female control group, it can confirm that these variables have a significant effect size, and cite a meaningful difference. The negative point estimate indicates that the girls with the kits were using on average .679 less pads per day. The range being between .46 pads and .9 pads fewer per day, to a 95% Confidence level.

It can be stated that those girls with reliable feminine hygiene protection change their pads less often. This results in a lower need to access a washroom or latrine, and allows the girls to remain in the classroom or carry out their daily activities with less disruption.

It is also important to note that without access to the MHM kits, limited options for menstrual protection are available within the region due to financial reasons, and disposable pads are not readily available for purchase. Figure 3 shows a reliance on cloth to capture menstrual flow with a limited number of the female participants using disposable pads.

Figure 3.

Types of Feminine Hygiene Products In Use Across All Participants



Note. Results exceed n = 350 as more than one option could be selected. MHM kits were not included as an option and represent the "other category". Also notable, no female participants use tampons or menstrual cups.

Table 12

Access to Menstrual Hygiene Products

	Frequency	Percent	Valid Percent	Cumulative Percent
I don't have access	3	.9	.9	.9
Somewhat difficult	69	19.7	19.7	20.6
Somewhat easy	89	25.4	25.4	46.0
Very difficult	46	13.1	13.1	59.1
Very easy	143	40.9	40.9	100.0
Total	350	100.0	100.0	

Note. This data highlights the lack of access to MHM products.

Based on the results found in Table 12, disposable pads are not highly accessible. Combining the categories of *somewhat difficult*, *very difficult,* and *not at all* 33.7 % female

participants do not have reliable access to feminine hygiene products, making menstrual hygiene management more difficult.

Table 12 results led to discussions within the Focus Group (FGD) about the challenges and the associated anxiety of finding appropriate resources so that they can leave home when menstruating. Not having access to MHM kits poses a significant barrier for girls to attend school regularly, particularly when they are menstruating. But having menstrual protection is not enough. Girls require dedicated spaces to address their hygiene needs.

Access to Latrines (without water) and Washrooms (latrine with access to water)

The next significant barrier for school attendance noted by girls within the study was access to washrooms (with or without water). The findings of these two separate, but similar variables, were linked. Having water within the washroom was only slightly more important than having a washroom without water. The difference in importance was 83.7 % for washrooms with water and 81.7% for washrooms without water. The difference in the importance of having water in the washroom is indicated. Hygienically, the ideal is to have both water and latrines, but as many schools do not have any latrine, the privilege of water is considered less as an essential. As more access to washrooms with water becomes the norm, the acceptability of having a washroom without water will decline. Interestingly, 83.7% of the female participants address their feminine hygiene needs at home with only 14.9 % using a washroom or latrine outside of the home (see Table 13). This raises questions regarding access to gender specific washrooms outside of the home.

Table 13.

Where Do You Change Your Menstrual Products?

	Frequency	**Percent**	**Valid Percent**	**Cumulative Percentage**
At home	293	83.7	83.7	83.7
At school	52	14.9	14.9	98.6
At work	4	1.1	1.1	99.7
Other	1	.3	.3	100.0
Total	350	100.0	100.0	

Note. It is unclear if the common practice of staying in the home during menstruation inflates these numbers. Further research is needed.

A lack of access to a latrine or washroom represents a significant barrier for girls to attend school, particularly during menstruation. Without access to either, girls are more apt to stay home. These findings were supported in both the FGD and KII (Maalim Mohamed & Alamtsehay, 2025; Maalim Mohamed & Saidia, 2024). Table 13 presents the questionnaire results. The use of a Likert scale is not common in Ethiopia, where surveys typically use yes/no questions. As a result, many responses were polarized with participants choosing “always” or “never.” This led to Chi-square and Symmetric Measure results that were statistically unreliable due to weak relationships. Further research is needed to verify the hypotheses and to ensure participants understand the Likert scale format. It is also possible that girls who believe they should not

attend school while menstruating consistently choose “never.” More data is required to draw firm conclusions.

Table 14 (see appendix).

The Pearson Chi-Square test had a value of $\chi^2 = 12.852$ with a standard deviation function of 16 and *p* value for asymptotic significance of .684. The Cramer’s V value of V = .096 and Phi value of $\phi = .192$ both show a low association between the variables and with a *p* = .684 for both, they are also outside of the range of being statistically significant or reliable.

It was also found that access to a latrine with or without water did not impact the number of times a girl addressed her feminine hygiene needs at school. This is not surprising because the data indicates that most girls change their feminine hygiene products at home. Chi-square calculations on both contexts (latrines without water or with water) were completed. Similar results were expressed with moderate associations, as seen in Table 15. Both were statistically significant.

Table 15.

Access to Latrines Without Water

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.163*	12	.003
Likelihood Ratio	23.886	12	.021
N of Valid Cases	350		

Note. *8 cells (40.0%) have expected count less than 5. The minimum expected count is .08. p value of .003 is not as statistically significant as .001, but is below the .005 to not statistically significant thresholds.

The Pearson Chi-Square of 30.2 and 12 degrees of freedom, and a *p* value of .003 indicates that having water with latrines is not important in this context. Having access to washroom facilities of any type in schools is still uncommon for girls within this region so just having a latrine was considered a privilege. Further research is required.

By comparison, Table 15 looks at washroom facilities with water available. This is known to be important for hygiene and sanitation. Washing hands after using the facilities promotes healthy practices. What was observed in Table 16 was very similar to Table 15 *Latrines (Without Water)*. Only slight variations can be seen in the association and its strength of that association meaning water is seen as a luxury within bathrooms, and does not deter girls’ use. Consequently, education is key in shifting hygiene behaviour.

The importance of building WASH latrines is a critical infrastructure needed across the educational system in the Somali Region of Ethiopia. Revisiting these research questions will be important once students become accustomed to having consistent access to washroom facilities on site.

Table 16.

Access to Washrooms/Latrines with Water

Chi-Square Tests			
	Value	*df*	*Asymptotic Significance (2-sided)*
Pearson Chi-Square	*27.930**	*9*	*<.001*
Likelihood Ratio	*22.721*	*9*	*.007*
N of Valid Cases	*336*		

Note. * 6 cells (37.5%) are expected to count less than 5. The minimum expected count is .11. The variability between the associations are similar. Moderate associations can be seen.

Challenges and Opportunities

Engaging in this form of social activism research within a politically unstable and socially volatile context, particularly in regions characterized by low economic development and susceptibility to natural disasters, presents significant challenges to community engagement and the support of grassroots initiatives. Even basic transportation between the communities poses a substantial barrier, limiting the frequency and consistency of service and resource delivery. Conditions are some of the most challenging imaginable.

Barriers such as unawareness of female reproductive health, menstrual cycles, Female Genital Mutilation (FGM), Early Marriage (EM) and household responsibilities held for females are significant contextual cultural factors that influence values around the roles and responsibilities of girls. Although this study began to explore education of these barriers through female educator outreach workers, these topics represent further research opportunities.

Call for Action

Over the past sixteen years the social activism role of Education 4 Change cannot be denied. Through an intentional process of Social Behaviour Change Communication (SBCC) commitment, Education 4 Change continues to focus on grassroots community engagement. Based upon the engagement of community elders, clear barriers were identified and the actions of the NGO evolved to address these critical needs.

Through this research, it was determined that there are several barriers to girls' access to and continuation of their education. The top five barriers were identified as household responsibilities, access to reliable feminine hygiene products, access to latrines (without water), washrooms (latrines with access to water), and avoidance of early childhood marriages. For the purpose of this article, research related to reliable access to feminine hygiene products and access to latrines (with and without water) were explored as they relate to perceived barriers for girls attending school.

The initial results are promising. When girls have access to reliable feminine hygiene products through MHM kits and access to latrines (with or without water), more girls believe that they can attend school, even during menstruation. Therefore, long-term data related to changes in school attendance and latrine use for female participants will be gathered. As we

continue to delve into this culturally nuanced work, it is important to partner with the Somali Region women and outreach workers, and staff of Education 4 Change. Although centering on the needs and relationships of the elders and community members is critical within SBCC frameworks, more importantly, this approach fosters sustainable ownership and development. Together, we ensure that education is a change agent for the good within Ethiopia's Somali Region.

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APPENDIX

Table 14.

School Attendance While Menstruating and Access to Latrines

		Never	Infrequently	Occasionally	Frequently	Always	Total
Strongly Agree	Count	26	2	1	1	170	200
	% within 28. Lack of access to latrine	13	1.0	0.5	0.5	85	100
	% within 20.	45.6	100	100	100	58.8	57.1
	% of Total	7.4	0.6	0.3	0.3	48.6%	57.1
Agree	Count	17	0	0	0	69	86
	% within 28. Lack of access for latrine.	19.8	0	0	0	80.2	100
	% within 20.	29.8	0	0	0	23.9	24.6

	% of Total	4.9	0	0	0	19.7	24.6
Neutral	Count	5	0	0	0	13	18
	% within 28. Lack of access for latrine.	27.8	0	0	0	72.2	100
	% within 20.	8.8	0	0	0	4.5	5.1
	% of Total	1.4	0	0	0	3.7	5.1
Disagree	Count	9	0	0	0	23	32
	% within 28. Lack of access for latrine.	28.1	0	0	0	71.9	100
	% within 20.	15.8	0	0	0	8.0	9.1
	% of Total	2.6				6.6	9.1
Strongly Disagree	Count	0	0	0	0	14	14
	% within 28. Lack of access for latrine.	0	0	0	0	100	100
	% within 20.	0	0	0	0	4.8	4.0
	% of Total	0	0	0	0	4.0	4.0

Total	Count	57	2	1	1	289	350
	% within 28.	16.3	0.6	0.3	0.3	82.6	
	% within 20.	100	100	100	100	100	100
	% of Total	16.3	0.6	0.3	0.3	82.6	100

Note. The skewing of the results to the extremes of the likert scale are seen.