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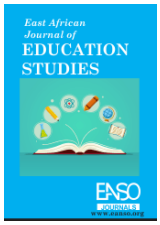

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Original Article

Demystifying Menstrual Health Management to Enhance Academic Performance among Adolescent Primary School Girls in Rural Uganda

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Adolescence, Menstrual health Management, Academic performance, Game, Storying, Gamification.

ABSTRACT

Efficacious menstrual health management (MHM) is critical to ensure effective physiological and psychological functionality as well as academic performance of school-going adolescent girls. This chapter presents an impact evaluation involving 60 [experimental (n = 30) and control (n = 30)] adolescent girls in primary five class in two distant schools in Tororo District in Eastern Uganda using a randomised controlled trial. A pencil and paper pre-test composed of English language, Mathematics, Integrated Science, and Social Studies was administered to both groups. The experimental group was entirely one school that was then engaged in storying and gamification of menstrual health management for sixty days. Participants in the control group were not provided with these. A pencil and paper post-test was again administered to both groups. Results indicated that the girls in the treatment group (provided with MHM) ($t = 8.498$, $df = 29$, $p < .05$), with ($M = 16.67$, $SD = 10.74$) obtained significantly higher scores than those in the control group (not provided with MHM), ($t = 4.28$, $df = 29$, $p < .05$), mean ($M = 6.83$, $SD = 8.74$). This implies that the provision of MHM to adolescent girls significantly improved their academic performance. We, therefore, conclude and recommend that provision of MHM in a story and game way to adolescent girls in primary schools, especially in the rural areas, be considered as a central policy issue in order to demystify menstruation and hence improve the academic performance of girls from those areas.

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INTRODUCTION

Gibson et al. (2019) posit menstruation as a natural fact of life and a monthly occurrence for women and girls of reproductive age. Menstruation is variously defined, but in this paper, we adopt the definition of Tellier and Hyttel (2018), who defines it as "the flow of blood and tissue lining the uterus through the vagina for about five days within 21-35 days". The process generally requires dignified, healthy and effective management, termed as menstrual health management (MHM), for optimum functionality and performance of the persons going through it. UNICEF (2013, 2014) defines MHM as: "women and adolescent girls using a clean menstrual management material to absorb and collect blood, that can be changed in privacy as often as necessary for the duration of the period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials." MHM includes "the provision of safe, private, and hygienic water and sanitation facilities for changing menstrual materials and bathing, easy access to water inside or near toilets, supplies (e.g., laundry soap, separate basin) for washing and drying menstrual materials discreetly, disposal systems through waste management, and access to practical information on MHM" (Sommer, 2013; Sommer et al., 2015).

According to Tellier and Hyttel (2018), MHM is a right and a development issue. Efficacious menstrual health management (MHM) is critical in ensuring effective physiological and psychological functionality as well as academic performance of adolescent school-going girls. The onset of menstruation comes with opportunities and vulnerabilities that arise during adolescence. The average age of menarche in Uganda is 14 (MoH, Uganda 2016) compared to 12.4 in South Africa (Jones et al., 2009). It can be argued that a lower age at the age of menarche reflects higher nutritional and socioeconomic status. Yet research (e.g., Schmitt et al., 2017) indicates in most parts of the world, especially low-income countries, many cultures have myths, discriminatory social norms, cultural taboos, poverty, and lack of basic services associated with menstruation. Such practices often have potentially harmful implications and result in unmet menstrual health and hygiene needs. Thus, menstruation remains a stigmatising occurrence despite being a natural process that defines normal womanhood. As a result of the stigma associated with menstruation, it is difficult for adolescent girls to disclose the challenges they experience during menstruation (Dutta et al., 2016; Sommer & Sahin, 2013) and, therefore, further difficult to afford them efficacious MHM.

MHM is a major agenda item for UNICEF, Non-Governmental Organisations (NGOs), and many government sectors in the developing world. In many African communities, menstruating girls are often stigmatised and discriminated against by their peers and male counterparts as unclean due to poor MHM (Beyene, 2015; UNICEF, 2012). Many schoolgirls in Africa have been reported to miss going to school or lessons or drop out of school

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entirely as a result of challenges of lacking sanitary pads and separate toilet facilities for female students at schools (Chandra-Mouli & Patel 2017; Kgware, 2016; Murungi et al., 2015). Furthermore, MHM has not been given adequate attention in both schools and within communities especially in Tororo District, Eastern Uganda. The communities lack knowledge and are entrenched in traditional practices of early marriage. Girls in such communities are considered ready for marriage as soon as they reach menarche.

In many cases, the adolescent girls lack training as well as guidance and counselling on how best they can handle their menstruation. Poorly handled MHM has also been associated with dodging play, fatigue, irritation (mood swings), headache, and lack of concentration (Dutta et al., 2016; Beyene, 2015). This profoundly affects the academic potential of millions of schoolgirls including those in the rural Tororo District. Government and civil society efforts to alleviate the knowledge gap and mitigate these practices are largely inadequate. As a result, adolescent girls develop negative body image, low self-esteem, poor academic engagement, and low educational attainment (Kgware, 2016; Water Supply and Sanitation Collaborative Council [WSSCC] and UN Women, 2014). Consequently, there is a high level of school dropout among adolescent girls in rural Ugandan districts such as Tororo, whose communities are mainly characterised by low socioeconomic status communities.

Scholars have variously asserted that education is the key to all areas of successful human endeavour. Relatedly, observed to Plan International (2020), water, sanitation, and hygiene (WASH) are the first line of defence against COVID-19 and yet millions of Ugandan women and girls are menstruating and grappling with the unique challenges of doing so in a global pandemic. Gibson (2019), in a UNICEF study, similarly notes the importance of a world where every girl can learn, play, and safeguard her own health without experiencing stress, shame, or unnecessary barriers to information or supplies during menstruation. Given that girls generally face difficulty in managing their menstrual periods at school due to challenges associated with MHM, this study aimed at demystifying menstruation by providing MHM to adolescent schoolgirls in rural Tororo District in Eastern Uganda. This was partly in response to the Uganda Ministry of Education and Sports (MoES, 2013) and Alexander et al. (2014) call to understand and manage menstruation effectively in education institutions to promote academic participation and progress. The objective of the study was to examine the impact of MHM on the academic performance of adolescent girls. To achieve this objective, it was hypothesised that the provision of MHM to adolescent girls would have a statistically significant positive impact on the girls' academic performance.

To corroborate the statistical findings, we asked the girls the following research questions: (a) How do you compare your experience of menstruation before the MHM program and during the MHM program? (b) How has the provision of MHM impacted your academic performance in terms of school attendance, engagement in-class activities, and scores in tests and examinations? The study was focused on the promotion of access to sanitary items and adequate sanitary infrastructure hence the involvement of local stakeholders such as parents and school management committees. It was hoped that the study would justify the need for providing a holistic education program focused on teaching and sensitising not only the adolescent girls but also their families, schools and communities with an emphasis on personal hygiene, menstrual material disposal, management of pain, prevention of anaemia, and psychosocial support such as counselling.

METHODOLOGY

Research Design

This study presents an impact evaluation involving 60 [experimental (n = 30) and control (n = 30)] adolescent girls in primary five class in two distant schools in Tororo District in Eastern Uganda. We employed Randomized Controlled Trial (RCT) experimental design using the Difference-in-Differences method to determine the difference in differences among the groups. The effect of provision or not of MHM on academic performance of adolescent girls was investigated for two randomly selected groups, experimental and control, over a period of six weeks. Both groups were administered a pencil and paper pre-test composed of English language, Mathematics,

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Integrated Science, and Social Studies. The experimental group, entirely in one school, was then engaged in storying and gamification of menstrual health management involving exposition of the facts and myths of menstruation, provision and making of sanitary pads, adequate washing facilities, some porridge, light physical exercise, and follow-up with parents at their homes. Participants in the control group were not provided with any of these. A pencil and paper post-test set similar in strength and structure to the pre-test but very different in items was then administered to both groups to determine the impact of the treatment on the academic performance of the adolescent girls. A qualitative research approach involving the interpretative phenomenological technique was used to obtain experiences from the participants in the experimental group. These were used to triangulate the quantitative results from the pre-and post-tests.

Study Population

The study population was comprised of adolescent girls studying as day pupils in Standard 5 in two distant primary schools located in two separate sub-counties in Tororo District in Uganda. There were respectively 77 and 75 girls in Standard 5 in the treatment and control primary schools (School A and School B), respectively, constituting a population of 152. Both schools were situated in the same cultural setting of the Jopadhola. The criteria of selection of the schools included similarity in socioeconomic activities and statuses of the surrounding population, similarity in performance at the primary leaving examinations (PLE) for the previous five years, and isolation from each other to minimise chances of contamination due to mixing and sharing of the menstrual hygiene materials and strategies. Girls in Standard 5 were engaged in the study because they were mainly beginners of their menstruation cycles, implying that they were not psychologically hardened enough to withstand the stresses and strains arising from the local myths of menstruation. Therefore, they had higher chances of absenting themselves from school during days of menstruation. In addition, girls from the same class were considered to control for differences in levels of education (class) and treatment.

Sampling Strategies and Sample Size

Only girls who were already experiencing menstruation were considered for the study, given that they would narrate a true experience of the effect of MHM on their current experience of menstruation and, subsequently, its impact on their academic performance. Of the 77 girls in School A, 60 girls indicated that they had already reached menarche, and all agreed to participate in the study. While of the 75 girls in school B, 57 were already experiencing menstruation and all these also agreed to participate in the study. The parents of the assenting girls were issued with consent forms delivered to them by their daughters to indicate by ticking whether they consented to their daughter participating or not. All the parents consented. After obtaining the consent of the parents, a simple random sampling technique using the lottery method was used to select the participants. In either case, 30 pieces of paper were labelled “yes”, and all others labelled “no”, folded to conceal the writing, and the learners were asked to pick one and unfold. Whoever picked “yes” was included in the study; those in School A were placed in the experimental or treatment group, while those in School B were in the control group. All those who picked “no” were rewarded with pens and handkerchiefs for their will to participate in the study. The sample size thus consisted of 60 [experimental (n = 30) and control (n = 30)] adolescent girls in primary five class in two distant schools in Tororo District in Eastern Uganda. The qualifying schools were at par as far as syllabus coverage for Standard 5 class was concerned, and the teaching, as well as academic guidance and support, was provided at nearly the same level.

After the post-test, the girls in School A were randomly assigned to five groups by counting one, two, three, … up to six. Every effort was made to posit all undertakings with the girls as fun and enjoyable game. The groups were named Group 1 (G1) to Group 5 (G5), respectively. Each group was separately engaged in a focus group interview.

Materials and Instruments of Data Collection

Strategies and materials for menstrual health management provided to girls in School A included the exposition of the facts and myths of menstruation through storying, provision and

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making of sanitary pads in a fun way—making it a game, adequate bathroom facilities, some porridge, light physical exercise including competitive ball games, and follow-up with parents at their homes. The pre-and post-tests were classroom tests of equivalent difficulties composed of English language, Mathematics, Integrated Science, and Social Studies. These are the subjects specified by the Uganda Ministry of Education and Sports as entailed in the National Curriculum Development Centre (NCDC, 2012) syllabus for Upper Primary. Each subject was tested using 10 items in both the pre-and post-test.

A focus group interview guide was used to collect qualitative data on the girls' experiences of menstruation before and during the administration of MHM, and their notions of the impact of MHM on academic performance. Two open-ended questions and several attendant probes were used to obtain the girls' responses. The interviews mainly took the form of brainstorming sessions given the age of the girls. The group interviews were recorded using digital audio recorders, and the recordings were then transferred to a computer for transcription.

Procedure

Approval for the study was sought from the Director, Directorate of Graduate Studies, Research and Innovations, Busitema University. An introduction letter was obtained from the Dean, Faculty of Science and Education, Busitema University. Permission to access the schools and learners was sought from the District Education Officer, Tororo District. Consent was sought from the parents whose adolescent girls had assented to participate in the study. The pre-test was administered before, while the post-test was administered after the provision of the menstrual health management storying and gamification. The tests together with the scoring rubrics composed of forty questions were set by senior assessment experts involved in setting and scoring items for Uganda National Examinations Board (UNEB) in the respective subjects. Each specialist set 20 items in their subject of specialisation: 10 for the pre-test and 10 for the post-test. These were then collated into separate sections of one examination paper to constitute the pre- and post-test, respectively. The tests were administered and proctored by class teachers of Standard 5 under similar conditions of quietness and time of the same day within two hours duration. Before the treatment (storying and gamification) was administered to the experimental group, both groups had to take the pre-test. The pre-test was scored, and the scores were converted to a percentage ranging from 0—100%. These were recorded and the learners' scripts were returned, and corrections were made.

The treatment (MHM) involved various activities done twice a week, on Tuesday and Thursday evenings, after classes, for a duration of one hour (from 4:30 p.m. to 5:30 p.m.) for the whole period of six weeks in the months of February and March 2020. Storying involved Senior Women Teachers (SWTs) and other invited role models sharing stories about the facts and myths of menstruation and MHM with the participants. Storying would often be accompanied by a demonstration of how and why to use sanitary pads, making reusable ones, minimising crumps, and maintaining hygiene during menstruation. The games involved competitive ball games such as soccer and netball; rope work such as competitive skipping; and any other creative sport such as running around the pitch and competing in 100-, 200-, 400-, or 800-meter runs. The games were supervised by the female teacher in charge of games at School A.

The storying and gaming were always followed by the provision of porridge, while a tablet of washing soap was given every Thursday to facilitate their cleanliness at home. Parents who were reported as uncooperative were followed by the SWTs at their homes to be educated on the importance of MHM in academic performance. Adequate water and cleaning materials were also availed at school A such that girls in their menstruation periods were free to clean up. Great care was taken not to provide academic guidance and support to the girls during the scheduled periods to set them at the same footing as their control group counterparts. It was expected that the girls would each go through menstruation at least once within the eight-week period in order to enable comparison of their experience this time around having received MHM with the experiences before MHM.

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After six weeks of MHM, the post-test was administered to both groups. At the end of the test, each participant was given a packet of sanitary pads, a bar of soap, a kilogram of sugar and some tea leaves. The post-test was then scored, each section by the subject specialist who set, and the total score was generated and converted into a percentage score. The scores ranged from 0—100%. The scores for induvial participants were recorded, their scripts were returned, and corrections were made. Participants in School B were each given a packet of sanitary pads, a bar of soap, a kilogram of sugar and some tea leaves as a reward for participation.

The learners in School A were engaged in Focus Group Interviews to share their comparative experiences of menstruation before and after MHM provision by our team and the impact of MHM on their academic performance. The interviews were recorded using digital audio recorders. Despite saturation, it was necessary to engage all the groups nearly equally in the interviews to rule out any incidence of feeling left out. After the interviews, the girls were each given a packet of sanitary pads, a bar of soap, a kilogram of sugar and some tea leaves as a reward for participation. The whole school was assembled for a talk on the myths and facts of menstruation and the need for adequate and appropriate MHM so as to enhance academic performance for all learners.

Data Management and Analysis

The pre-test and post-test scores were entered for both groups (Treatment and Control) in Statistical Package for the Social Sciences (SPSS) for further management and analysis. The data were then cleaned and analysed using descriptive statistics and inferential statistics to determine the difference-in-differences in academic performance between the two groups. This involved use of mean and standard deviation as descriptive statistics and paired samples t-test as inferential statistics to first determine the difference in academic performance of the adolescent girls in the experimental group before and after administering MHM, and then the difference in academic performance of the adolescent girls in the control group before and after administering MHM. Then the impact of MHM on academic performance among adolescent girls was analysed by determining the difference in differences of the mean scores for the experimental and control groups. In this case, the difference (A) was obtained by $\boldsymbol{A = (B - C) - (D - E)}$ where B is the mean post-test score for the experimental group, C is the mean pre-test score for the experimental group, D is the mean post-test score for the control group, and E is the mean pre-test for the control group.

The interviews were identified using codes, for instance, G1/2020/03/17 represents an interview with Group 1 held on March 17, 2021. The audio recordings from the focus group interviews were transcribed using MS Word application software. The transcripts were read and reread independently by the researchers to gain a deeper understanding of the participants' responses. Verbatim quotes from the transcripts were identified to triangulate the quantitative findings on the impact of MHM on the academic performance of adolescent girls.

RESULTS

Quantitative Results

This study sought to evaluate the impact of MHM on adolescent primary school girls' academic performance in two distant schools in Tororo District in Eastern Uganda. This involved determining the differences in mean scores before and after MHM separately for the experimental and control groups, followed by the determination of the difference-in-differences between the two groups. The study participants (N = 60) had a mean age of 14.43 (SD=1.55), ranging from 11 to 17 years. The results of academic performance of the adolescent girls in the experimental group before and after administering MHM revealed that the post-test score was higher (M =46.53, SD =28.04) than the pre-test score (M =29.86, SD = 19.45) giving a difference of 16.67% score in the means (SD = 10.74). A paired samples t-test revealed that the difference between the pre-test and post-test scores was statistically significant (t = 8.498, df = 29, p < .05). This suggests that keeping all other factors constant, provision of MHM to adolescent girls contributed to better academic performance.

The mean post-test score of the girls in the control group (School B) after MHM was also higher (M = 28.93, SD = 21.32) than the mean pre-test score (M =22.10, SD = 17.25), giving a lower difference *(M*

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= 6.83, *SD* = 8.74) than in the experimental group. A paired samples t-test was run to determine the difference in the academic performance of the adolescent girls in the control group before and after administering MHM. The t-test showed a significant difference between the academic performance of the control group before and after the test (t = 4.28, *df* = 29, $p < .05$). This suggests both the experimental and the control groups improved in their academic performance over the period of study. However, the mean post- and pre-test difference in the control group was far lower than the mean post- and pre-test difference in the experimental group as shown in *Table 1*.

Table 1: Difference in Differences of mean scores (%) for the post- and pre-tests for the experimental and control groups

Condition	Experimental	Control	Difference
After administering MHM materials	46.53	28.93	17.60
Before administering MHM materials	29.87	22.10	7.77
Difference	16.66	6.83	9.83

Results in *Table 1* indicate that MHM generally caused a 9.83% positive impact on the academic performance of the adolescent girls in the experimental group (School A) over those in the control group (School B). This implies that storying and gamification of menstrual health management through the provision of knowledge, skills, and appreciation of values is a necessary condition for enhancing the physiological and psychological competence of adolescent girls in order to leverage their academic performance. Results also show that there was a 6.83% increase in performance of the girls in the control group. This means despite not receiving MHM as in the experimental group, the girls also experienced other growth factors that enhanced their academic performance to a certain level.

Qualitative Findings

Focus group interviews were conducted to generate answers to the following research questions in order to corroborate the quantitative findings: (a) How do you compare your experience of menstruation before the MHM program and during the MHM program? (b) How has the provision of MHM impacted your academic performance in terms of school attendance, engagement in-class activities, and scores in tests and examinations? The findings are analysed using a hermeneutic interpretative phenomenological approach involving both verbatim and paraphrased responses to suit the

Perception of Experience of Menstruation Before and During MHM Program

The focus group interviews revealed that the girls generally perceived a positive difference in menstrual experience during the school-based administration of MHM. Their attitude towards the reality of menstruation used to be largely negative, but with the demystification and sensitisation during the MHM, many reported positive attitudes. For instance, a participant in G3/2020/03/17 expressed that, “Before, I used to feel bad, but now I can do everything even when I am in my period.” Another girl in G1/2020/03/17 expressed feelings of liberation from fear of boys during menstruation, “I used to fear, be scared of boys, but after the lessons, I can now even play with them.” This speaks to the fact that the storying of MHM plays a significant role in demystifying menstruation and thus serves a liberating effect on the girls’ psychological self-perception. This in effect, reduces the negative physiological effects which often originate in the psychological conditions.

Many of the girls felt empowered to be of help to their younger colleagues who had not yet reached menarche and to other ignorant fellows who believed in the myths of menstruation. A girl in G1/2020/03/17 exclaimed, “I’m gonna teach all my sisters these things!” Another one in G4/2020/03/17 felt relieved that at last, she knew how to make reusable sanitary pads using local materials.

Some of the girls reported changes in the duration and volume of menstrual discharge. One girl in G5/2020/03/17 stated, “I don’t know whether it is

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because of the exercises, but this time the flow was very heavy, I mean like serious for only two days, and almost over in Day 3. Those days it would not be heavy but would take more days, but it was more painful." There was the exchange of ideas on how best to handle heavy flows and painful experiences using local herbal concoctions which were unanimously known to work for the local womenfolk. With the critical investigation of what works for pain relief and reduction of the volume of menstrual flow, it would be possible to advance home-grown solutions to some of the challenges of menstruation that cause absenteeism among the girls.

The provision of adequate cleaning and washing materials reduced the embarrassment which the girls used to face. One of the participants in G5/2020/03/17 noted that "like seriously I was coming to school during my periods because of what you people gave us to use – the pads, the porridge – me I have an appetite (all laugh), you can change, you can wash, you know! Otherwise, my periods are usually bad." This amplifies the fact that hygiene during menstruation needs to be keenly observed through the provision of adequate menstrual hygiene materials and strategies including washing facilities, pain killers in some critical cases, exercises, and food. On the other hand, it should be noted that some of the girls come from such humble backgrounds that they cannot afford the niceties of MHM as revealed by one girl in G2/2020/03/17, "if not you people, me I do not know where, whether I would get these things. For me, there is nothing at home, nobody to give you anything!" This implies that the government and its partners of education need to take it upon themselves to provide menstrual hygiene materials. Otherwise, with a school schedule of "leaving home at six [in the morning] and reaching home at six or seven [in the evening]" (according to a participant in G1/2020/03/17), it is difficult for a girl in her menstruation period to feel comfortable the whole day and participate actively in academic engagements.

Impact of MHM on Academic Performance

There was a general agreement among the participants that our provision of MHM was instrumental in improving their regularity in school attendance, participation in studies, and scores in tests and examinations. During the storying sessions, the SWTs presented the process as normal, not to be ashamed of, and one which should not affect other activities such as home chores and school engagements. The older girls often served as peer-to-peer mentors for the younger girls. The latter got encouraged to cope with the demands of menstruation. A participant in G2/2020/03/17 attested to this, "I used to dodge school because I would say I'm sick. But after Sarah [not real name] said that 'if you miss school, you lose twice,' I think I'm not going to dodge again."

The MHM sessions further inculcated other study skills such as sharing of experiences, even with boys. One of the girls in G4/2020/03/17 acknowledged the fact that she never used to consult boys in academic matters due to a hyped feeling that they would tease or bully her. She then confessed that "this thing [MHM] has helped us. Even if they [the boys] do what, you just tell them to behave as boys and give or tell you what you want." This is a demonstration of assertiveness skills that came with the storying and gaming of MHM. This implies that there is a need to institute the MHM initiative in all schools to upskill all the learners in being supportive to one another in all ways – social, psychological, emotional, and otherwise.

DISCUSSION

The statistically significant difference in academic performance among the experimental group before and after the administering of MHM implies that the provision of MHM enhanced the competence (*i.e.*, knowledge, skills and values) of the girls to handle the process of menstruation effectively without negatively affecting their academic progress. In line with the findings of studies by Eshiwani (1983), Lidonde (2005), UNICEF (2010), and WaterAid (2013), which reveal that poor MHM in schools causes adolescent girls to worry and humiliation, contributes to absenteeism and consequently leads to poor performance in schools, we show that effective MHM is a precursor of improved academic performance, most significantly because the provision of MHM materials and guidance offered security against worry and humiliation, and minimised absenteeism. Similarly, the results agree with that of a study by Forum for African Women

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Educationalists (FAWE, 2004) in Uganda, which reveals that lack of sanitary pads coupled with other factors like absence of water and separate toilet facilities for the girls in many schools is responsible for the high school girl child dropout rates (Linda Scott et al., 2009). This finding serves as a wake-up call to the stakeholders of education including the Government, parents, School Management Committees (SMCs), and Community Based Organisations (CBOs), to treat girl-child education as a delicate venture in poorly resourced communities by endeavouring to provide MHM to the adolescent girls.

From observations during the selection of the two schools, it was apparent that many schools did not support adolescent girls in MHM, which was likely to be a common occurrence in developing countries like Uganda. This resonates with what Kabagambe (2015) observes in his study on *Tapping into Gained Opportunities to Scale Menstrual Health Management*. Therefore, the ministries of education need to incorporate MHM into the various school curricula in order that the girls' academic performance is not compromised through physiological and psychological torture due to menstruation and its attendant myths. Such an intervention would make the adolescent girls feel comfortable at school and hence concentrate on their academic pursuits.

Results for the control group showed a slight improvement in academic performance probably due to spillover or contamination from the experimental to the control group given that there is the appreciable movement of persons and hence information among relatives, friends, and in-laws within Tororo District. In this case, the girls in the control group could have mimicked those in the experimental group in MHM. This spillover could have affected the study pattern of both groups given that an external test heightens study habits. In addition, there is a high likelihood of maturation of all the girls, leading to better academic performance within the same class. It should be noted that the Uganda Education Act (2013) stipulates that all schools should have infrastructure like wash and changing rooms, disposal facilities for used sanitary pads, spare uniforms for the adolescent girls, and a supportive environment to enhance the psychosocial and emotional health of learners.

As a national policy, parents are expected to provide meals, but many of them, especially in the rural areas cannot even provide the minimal daily bowl of maise porridge (Acham et al., 2012; Child Trends, 2013). However, the majority of the girls in the experimental study revealed that their parents could not provide for their menstrual hygiene needs. Coupled with the endemic stigma and myths about menstruation in the village, many of the adolescent girls prefer to absent themselves from school during menstruation to the detriment of their academic performance (Chavkin & Williams, 1989).

The study has shown that the provision of MHM to adolescent girls has a significant positive impact on their academic performance. MHM caused a nearly ten percent increase in performance after correcting for the experimental noise among the adolescent girls in the study. Though this is apparently a small percentage, in the assessment of learning, it would make a huge difference in placing the learners in different grades and affording them different courses of study or positions in employment. One of the main assertions based on this finding is that adolescent girls do not experience the same level of fairness with regard to satisfying their MHM needs. This then has a negative bearing on the academic performance of those whose MHM falls below the expected bare minimum. This study has shown that menstruating girls need the critical provision of MHM (Simon, 2015). Managing their menstruation and maintaining a good standard of MHM is slightly difficult for adolescent girls because of socioeconomic factors such as inadequate water, soap, lack of privacy, inadequate medical services, and poverty (Schmitt et al., 2017). According to a study by Chebii (2012) focusing on the dynamics in the school space, a girl's education is the most important investment for women because of its contribution towards better health for their families, alongside increasing the women's potentials as well as lowering fertility rates. Therefore, investing in their MHM through the provision of the bare necessities, as advocated for by Afri-Can Trust (2015), is a good strategy to foster their quality academic growth and development.

CONCLUSION

The provision of MHM through storying and gamification has proved to be essential to enhance

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academic performance among adolescent girls, given its significant positive effect. The girls need to be provided with competence building strategies including clearing of misconceptions and myths while establishing the facts of menstruation; materials for MHM such as pads, water, soap, and light meals; and light physical exercises in addition to regular sensitisation to boost their academic performance. All stakeholders of education including healthcare practitioners and policymakers, teachers, officers of education, hygiene promotion officers, social workers, and politicians need to be trained in issues of MHM in order to reorder the societal attitudes about menstruation and so be able to support parents and schools in providing MHM. This way, the negative societal attitudes toward menstruation can be averted and the girls are able to access correct, basic information before and during menstruation.

Recommendations

We recommend that MHM should be included in education policies and intimately enmeshed into the curriculum, ensuring that schools have sustainable access to clean, safe, adequate and equitable water, sanitation and hygiene services. In addition, there is a need for mentors to monitor and positively intervene in the collective and as well as personal menstruation-related issues affecting the academic progress of the girls. This will ensure that the myths, taboos and stigma around menstruation are addressed by providing women, girls, men and boys with information on menstruation so as not to further propagate or reinforce misinformation along the way. Boys and learners with disabilities should particularly be targeted for such an initiative to yield the much-desired enlightenment and empowerment in MHM. “This knowledge will facilitate in breaking the silence around menstruation, ensure that women and girls menstruate in a safe and hygienic environment and that menstrual waste is properly disposed of” (Republic of Kenya Ministry of Health, 2019).

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Declaration of Conflict of Interest

The authors declare that there was no conflict of interest in the study.

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