

Assessment of Menstruation-Associated Absenteeism Among School Girls in Jalingo: Cost-Effective Interventions for Resource-Constrained Settings

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Abstract: Grave concerns have been raised about the limitations that inadequate menstrual hygiene management (MHM) imposes on girls, especially in developing countries. This study follows up on the previous work on the subject done in Jalingo, Nigeria by Nnennaya *et al*, but specifically on menstruation-associated school absenteeism and its impact on academic output. Data extraction was done on the responses generated by Nnennaya *et al*; re-adapted for variables reflective of school absenteeism; subjected to content and comparative analyses; and extrapolated to quantify school absenteeism and its impact on academic output. Appropriate remedial interventions were deduced. Menstruation-associated absenteeism led to a loss of 20% of active school-days and 13.06% decline in school-based productivity. Excuses from class to attend to MHM needs resulted to a loss of 12.5% of active class-hours/day, a loss of 3 man-hours/month, and a decline of 0.86% in school-based productivity. Menstruation-associated absenteeism imposed on girls a disadvantage in academic performance of 2.9 – 5.5% compared to boys. These losses combined with other social pressures of MHM to nudge many girls to drop out of school. Menstruation-associated school absenteeism among adolescent school girls in Jalingo was high, affected their academic performance adversely and predisposed the girls towards school drop-out. Sustainable remedies in such high resource-constrained setting include: extensive enlightenment, counseling and demonstration sessions on MHM; promoting universal access to free reusable sanitary pads; and provision of affordable OB14-CLCA type latrines in schools.

Keywords: Girl-Child Education, Menstrual Hygiene Management, Period-Poverty, Poverty Alleviation, School Dropout, Stigmatization, Taboo, WASH

1. Introduction

Menstrual Hygiene Management (MHM) refers to the information, materials, attitudes, practices and facilities required to effectively manage the health and hygiene-related issues of girls and women during their menstruation. [1] MHM remains a significant challenge to adolescent girls and women in low and middle-income countries. [2-4] Sub-Saharan Africa has one of the world's fastest-growing teenage girl populations, most of whom have attained menarche. [5] However, the lack of access to quality sanitary materials, inadequate knowledge, taboos around menstruation and MHM, and poor water, sanitation, and hygiene (WASH) facilities are challenges that have a negative impact on their health, education, social lives, economic activities, and psychosocial outcomes. [2-4, 6]

Although MHM is not expressly mentioned in the Sustainable Development Goals (SDGs), its improvement contributes toward the achievement of some SDGs including ending poverty (SDG 1), good health and well-being (SDG 3), inclusive and equitable quality education (SDG 4), gender equality and women empowerment (SDG 5), clean water and sanitation (SDG 6) and economic growth, productive employment and decent work for all (SDG 8). Identifying and prioritizing MHM ensures that its impact on the lives of women and girls such as gender-based discrimination and stigma are addressed. [7]

Several studies and policymakers have raised concerns about the limitations of menstruation on school attendance and achievement by girls. [8] A World Bank statistics highlights that girls could miss up to 4 days of school every month due to menstruation. [9] This means that they could miss about 10% – 20% of school attendance, which will seriously impact their achievement. [10] But there are wide variations among different settings. In a study conducted in Nepal, 198 girls reported that menstruation has minimal impact on school attendance, estimating that girls missed an average of 0.4 days in a 180-day school year. [11] But another study in Delhi, India reported that out of 600 girls, 245 (40%) remained absent from school during their menstruation. The study associated the absenteeism with the type of sanitary pads used, restrictions imposed on girls during menstruation, level of

mothers' education, and source of information on menstruation. [12] In the same study, about 65% of the girls reported that it affected their daily activities at school; and that they tend to miss their class tests and classes due to pain, shame, anxiety about leakage, and staining of their uniforms. In rural Zambia, school girls that are menstruating would rather stay at home than be uncomfortable, inactive, or embarrassed due to inadequate MHM facilities at school. [13]

In Nigeria, research into the quantitative impact of menstruation on girls' education is yet rudimentary, especially in northern Nigeria. Therefore, this study will expand insight into the state of affairs as the world races to remove all barriers to the attainment of the highest standard of life for the girl-child. This study will ascertain the proportion of girls absenting from school during menstruation; quantify resultant school absenteeism associated with MHM; identify the major driving factors associated with absenteeism during menstruation among adolescent girls attending secondary school in Jalingo, Taraba State, Nigeria; and recommend sustainable intervention programs. The findings of this study will assist government, policymakers, and other vital actors interested in advancing girl-child education, health, well-being, and overall development to adjust and re-adapt appropriate interventions to achieve set goals.

2. Method

Data extraction, data analysis, content analysis, comparative analysis, extrapolation and deductive model were adopted. Relevant data were extracted from the questionnaire responses generated by Nnennaya *et al.*; [14] re-adapted them for variables that are reflective of school absenteeism; and presented them in a concise tabular form. The re-adapted data were compared, content-analyzed and extrapolated to quantify menstruation-associated absenteeism and its impact on academic performance. Subsequently, appropriate, effective and sustainable intervention programs that will remedy observed negative impacts on adolescent girl-child schooling were deduced.

3. Result

Table 1. Menstrual Hygiene Management and Associated School Absenteeism by Adolescent Secondary School Girls in Jalingo (n = 297).

Variable	Frequency	Frequency	Frequency	Frequency	Frequency
Number who absent from school during menstruation (n=297)	Yes: 194 (55.3%)	No: 103 (44.7%)			
Major reason for absenting from school during menstruation (n=194)	Menstrual pain: 54 (27.8%)	Fear of unexpected bleeding: 52 (26.6%)	Lack of sanitary facilities in school: 35 (17.8%)	Embarrassment: 29 (15.2%)	Lack of sanitary Pads /absorbentmaterials: 24 (12.5%)
Type of absorbent material used during menstrual periods (n=297)	Sanitary pad: 127 (42.7%)	New piece of cloth: 89 (30.0%)	Old piece of cloth: 32 (10.8%)	Toilet paper: 26 (8.8%)	Cotton wool: 23 (7.7%)
Reasons for not using disposable sanitary pads during menstrual periods (n=170)	Lacking knowledge on how to use sanitary pads: 29 (16.8%)	High cost: 61 (36%)	Shame to buy from a shop: 43 (24.6%)	Unavailability: 31 (18.5%)	Tradition of using cloth: 7 (4.0%)
Change of absorbent each day (n = 297)	Once: 23 (7.7%)	Twice: 93 (31.3%)	Thrice: 129 (43.4%)	More than 3 times: 52 (17.5%)	

Source: Extracted and Re-adapted from Questionnaire Responses Generated by Nnennaya *et al* (2021) [14].

4. Analysis and Discussion

4.1. Analysis

In Table 1, all the five variables of relevance and their frequencies have been analyzed in form of percentages for further comparative analysis. Of the 297 school girls previously surveyed, 55.3% absented themselves from school during their menstruation compared to 44.7% who attend school during their menstruation. Of the 194 school girls that absent from school during menstruation, the highest reason adduced for absenting was menstrual pain (27.8%) followed closely by fear of unexpected bleeding (26.6%) and lack of sanitary facilities in school (17.8%). For absorbent materials used during menstruation, 42.7% use sanitary pads while 40.8% use new pieces and old pieces of cloth combined. The rest 8.8% and 7.7% resort to use of toilet paper and cotton wool, respectively. High cost of sanitary pads was indicated as the highest reason (36%) for non-use of sanitary pads, followed by shame to buy from shops (26.4%). Most of the girls (43.4%) change absorbents three times a day while 31.3% change their absorbents twice per day during menstruation.

For estimating school absenteeism associated with menstruation, we used the average menstrual cycle of 28 days; an average menstrual duration of 4 days (to avoid over-estimation); and an average active school period of 6 hours (from 8am - 2pm). The average menstrual cycle of 28 days consist of 4 weeks, involving 8 weekend days (4 Saturdays and 4 Sundays of non-schooling) and 20 active school days. If there were no menstruation, all the 297 school girls would produce 5,940 worth of active school days and 35,640 man-hours of active schooling every 28 day-cycle.

But then, for each of the 194 menstruators absenting from school for 4 active school days out of 20 active school days every 28 days, there is a 20% loss in active school days. All together, the 194 absenting menstruators lost 776-worth of active school days and 4,656 man-hours every 28 days. Hence, for every 28 days, school-based productivity will declined from 5,940 active school days/35,640 man-hours to 5,164 active school days/30,984 man-hours. This is approximately 13.06% decline in school-based productivity for the adolescent school girls.

For the 103 menstruators that attend school during menstruation, some losses are still experienced. It is likely that a menstruating student would excuse herself from class activities to inspect herself; change her menstrual pad; dispose the menstrual pad; clean herself up; and replace a new pad if necessary. The time these activities will take will depend on many factors including availability and distances of WASH facilities and waiting period at the toilet facility. Of all the 297 girls, 129 (43.4%) reported changing their menstrual pads 3 times a day while 93 (31.3%) reported changing their menstrual pads 2 times a day.

We therefore estimate that each of the 103 menstruating girls attending school will excuse herself from class at least once to attend to her menstrual needs for a minimum duration of 45 minutes. This amounts to a lost class time of 12.5% per

day for each school attending menstruator. For the 4 days of menstruation, this will amount to a loss of 3 man-hours for each menstruator and 309 man-hours for the 103 school attending menstruators. This translates to a further decline of 0.86% in school-based productivity in general.

It has been sufficiently shown that school absenteeism negatively affects academic performance, the longer and the more persistent the absenteeism, the greater, the impact. Aucejio and Romano [15] found that a reduction in the length of missed school days by 10 days would yield a gain of 2.9% and 5.5 % in reading and math respectively. We can extrapolate this association to imply that the 194 menstruators in our study who absent from school 4 days in a month or 12 days in a school term of 3 months loose the said range (2.9% - 5.5%) of academic performance when compared with boys who do not experience menstruation-associated absenteeism.

Ordinarily, most young girls while growing up see 'bleeding' as a serious matter. For most of these young girls, their first period comes as a 'shock', especially when it occurs in odd places and at odd times when they are least prepared for it. Such psychological shock may remain for life. When this shock experience is compounded with stigmatization, low self esteem and depression, poor social adjustment often result.

When decreasing academic performance inter-play with the pressures of period poverty, and co-habit with low self esteem, depression, poor social adjustment and exclusion, the young girl is pushed to the precipice of dropping out of school. Eventually, many of the girls will drop out of school.

Dropping out of school prematurely implies that the girl's career is truncated. Her total capacity is stultified in all respects including literacy, skill acquisition, economic potentials to secure decent job and income, and civic capacity to contribute to community development and provide needed reproductive health leadership to her family. This all round limitation will tend to cage the girl-child within a vicious circle of poverty that the Sustainable Development Goals approach is aspiring to eradicate.

Our major findings may be summarized as follows:

1. A majority of the school girls (194/297: 53.3%) absent themselves from school during menstruation for about 4 days in a month leading to a loss of 20% of active school days for each of the absenting menstruator.
2. All together, the 194 absenting menstruators lost 776-worth of active school days and 4,656 man-hours every month, leading to a 13.06% decline in school-based productivity.
3. Each of the 103 menstruators that attend school during menstruation experienced a loss of 12.5% of active class hours per day; a loss of 3 man-hours per month; translating to a further decline of 0.86% in school based productivity.
4. Menstruation-associated absenteeism imposed a disadvantage in academic performance of not less than 2.9% - 5.5 % on girls when compared with boys in

school term-based assessments.

5. Declining academic performance, when combined with stigmatization, poor social adjustment and poverty-pressures that the girls face in their families propel some of the girls to drop out of school.

4.2. Discussion

Our findings on menstruation-associated absenteeism from school are consistent with the findings of other scholars on the subject, though the degree of effect varies from place to place depending on many local peculiarities. While our study found a 55.3% menstruation-associated absenteeism in Jalingo, Nigeria, Jessica *et al* [16] found only 11.1% absenteeism in Indonesia while Sivakami *et al* [17] found 6% - 11% menstruation-associated absenteeism in three selected States in India in 2015. But in Delhi, India, Vashisht *et al* [12] found 40% menstruation-associated school absenteeism while Tegene & Sisey [6] reported more than 50% in Northeast Ethiopia.

Definitely, menstruation-association absenteeism will negatively affect educational output and academic performance. Our study in Jalingo, Nigeria found a 13.06% decline in school-based productivity among absenting menstruators and 0.86% decline among school-attending menstruators. Some other scholars made related but varying findings. Sivakami *et al* [17] found that 40% and 45% of girls in model and regular schools respectively reported that menstruation affected their concentration in academic studies. Vashisht *et al* [12] found that in general terms, about 65% of girls surveyed reported that menstruation affected their daily activities at school such that many had to miss class and class tests. Aucejio and Romano [15] reported that if absenteeism was reduced by 10 days, a gain in academic performance at standardized testing of 2.5% and 5.5% would result in reading and math, respectively.

Gender discrimination in African societies is well known. In sharing privileges, males take first consideration, but in sharing burdens, females take first consideration. While boys usually drop out of school mainly for consideration of vocation and business, more girls are likely to drop out of school from stigma, period poverty and declining academic performance arising from menstruation-associated absenteeism and related matters. Our findings that declining academic performance arising from menstruation-associated absenteeism while interplaying with other linkage factors will ultimately predispose many girls to drop out of school is collaborated by other scholars and reports.

While comparing the findings of researches separately done in North Macedonia by both Tull and Rockaya, Ajari *et al* [18] inferred that more Nigeria women and girls are predisposed to school dropout than their North Macedonian counterparts due to period poverty and missing out on school work due to menstruation. In her study evaluating all factors contributing to girls dropping out of secondary schools in Nigeria, Uche [19] reported that 89% and 15% of 240 respondents ascribed girls' drop-out from school to poverty and poor academic performance, respectively. Isamotu [20]

citing Unicef reported that about 1,300,000 girls drop out of school annually in Nigeria at Junior Secondary School level. Afisunlu [21] citing the United Nations, reported Nigeria's notoriety as the world's highest in school drop-out syndrome.

It is important to understand the underlying factors driving our observed high rate of school absenteeism during menstruation. In row three of Table 1, five reasons adduced by 194 students for absenting from school during menstruation are, in order of magnitude: menstrual pain; fear of unexpected bleeding; lack of sanitary facilities in school; embarrassment and lack of sanitary pads. It is not doubtful to say of the girls who absented from school for reasons of fear of unexpected bleeding and embarrassment, that if they had access to sanitary pads and if there were adequate sanitary facilities in their schools, their fear and embarrassment would have been assuaged. Hence, apart from menstrual pain which is clearly physiological, the major factors driving menstruation-associated absenteeism in this case are lack of sanitary facilities in schools and lack of access to sanitary pads.

From rows 4 and 5 of Table 1, we note that only 127 (42.5%) of the girls had access of sanitary pads while 170 (57.3%) used other materials as absorbents. These 170 girls attributed their non use of sanitary pads to, in order of magnitude, high cost (36%), shame to buy from a shop (24.6%), unavailability (18.5%), lack of knowledge on how to use sanitary pads (16.8%) and tradition of using cloth (4.0%). These reasons point to two other underlying driving factors (i) ignorance, taboo and stigma; and (ii) poverty.

Accordingly, in all, four underlying factors are identifiable as driving menstruation-associated school absenteeism, namely: lack of sanitary facilities in school; lack of access to sanitary pads; ignorance, taboo and stigma; and poverty. These can be substantiated further. Unicef [22] in their study of MHM in Nigerian schools found that only 50% of the schools had functional water sources within the school compound, and the ratio of latrine compartment to students was 1:297 for girls compared with global recommended standard of 1:25. Ajari *et al* [18] provides in-depth illustration of the limiting impact of cost consideration on MHM, with cost of sanitary pads taking as much as 16.8% and 33.6% of the monthly income of double and single family-earners, respectively. Daily Trust [23] and BBC [24] substantiate that the adverse impact of cost challenges on MHM in Nigeria is widely pronounced.

Ignorance, taboo and stigma surrounding menstruation are still high in Nigeria despite modest improvements in adult literacy rates of 62.02% and 62.7% for Nigeria and Taraba State, respectively. [25, 26] This is understandable because the two dominant religions of Christianity and Islam, as well as African Traditional Religions, all hold menstruation as mystically unclean process. Menstrual discharges and MHM materials are therefore held to be diabolically potent resources to be feared, avoided or even used for ritualistic harm. [27] The implications of this 'blacklisting' of menstruation by religious teachings and belief are that strong taboo status is sustained on menstruation; stigma against

menstruators are reinforced; and ignorance about menstruation is promoted by suppressing open discussion and understanding on the subject. [28]

All the preceding three drivers of menstruation-associated school absenteeism are themselves driven by poverty; hence poverty is the deepest driving factor. Poverty in Nigeria is pervading, from the Federal Government down to the individuals. According to a World Bank Report, [29] 40% of Nigerians live below the national poverty line with per capita expenditure below N137, 430.00/year; and only 17% of Nigerian workers are in jobs which wages are able to lift people out of poverty. Yet, Government support to households is scant. Both unemployment and under-employment are high at 33.3% and 22.8% respectively. [30] The average monthly income of poor Nigerians is less than N11, 500 while average daily income is about N380. [31] Taraba State (of which our study area, Jalingo, is the capital) is named as the second poorest State in Nigeria with a poverty head count of 87.73%. [32]

From the stand-point of pervasive poverty background, we observe from Nnennaya *et al* [14] that 224 (77.4%) of respondents depend on single family income since their mothers are not employed. Additionally, these girls face intra-family competition from other siblings for up-keep from the meager single income, considering Nigeria's average family size of 4.7 persons. [18] This pervasive poverty background partly explains Government's incapacity to provide adequate WASH facilities in schools which discourages 35 (17.8%) of menstruators from attending school during their periods. The same poverty scenario explains why 61 (36%) menstruators cannot afford sanitary pads; as well as the incidence of poor supply and inaccessibility of sanitary pads reported by 24 (12.5%) and 31 (18.5%) menstruators in Table 1. The resulting period poverty is the reason that 121 (40.8%) of menstruators still use cloth for padding, while 8.8% and 7.7% use toilet paper and cotton-wool as pad, respectively.

Understanding poverty as the deepest underlying factor driving menstruation-associated school absenteeism teaches us a very useful lesson pertaining to intervention programming. This is to say that for any intervention program to be effective, efficient and sustainable in a highly resource-constrained setting such as Jalingo, such intervention program shall:

1. Minimize direct monetary expenditures, as far as possible, on the part of governments, donors, communities, families and menstruators.
2. Mobilize, as far as possible, self-help efforts and contributions from menstruators, families and communities.
3. Rely on levels of technology and materials that can be sourced locally from the immediate environment to ensure sustainability.

Accordingly, we recommend the following sustainable intervention programs:

i). Designation of Desk Officer - Reproductive Health (DO - RH) in all secondary schools in the State by the State

Ministry of Education.

Such Desk Officer shall be nominated by the school principal from among serving teachers in the school (in just the same manner as serving teachers are designated for such portfolios as sports, library, debate, agriculture, etc), who show flair, interests and capacity in reproductive health issues.

The DO - RH shall acquire further competence and experience by exploring existing opportunities for capacity development. Minimal material requirements for effective operation of the DO - RH include one room office accommodation, a table, a desk, two chairs, a standing mirror, a pen, a notebook, and a trash-can. These are affordable within school and community resource-capacities. Relevant Information Education and Communication (IEC) materials will be sourced from nearby health facilities and program outlets.

The DO - RH shall, among other tasks, ensure that all newly admitted girls receive as part of their orientation, enlightenment, counseling and demonstration sessions on MHM, including use of sanitary pads. Such sessions shall, of course, continue on routine basis, on request, or as the DO - RH may deem necessary. This practice will ensure that pre-menarche girls are provided with the necessary 'preparedness' for transition to menarche. For all girls, the project will provide not only adequate capacity for improved MHM but also the resilience to cope and overcome stigmatization and discrimination.

ii). Promoting universal access to free re-usable sanitary pads through local self-help production.

A group of DO - RH within a neighborhood or educational jurisdiction may cooperate to pursue a venture of producing re-usable sanitary pads locally using locally sourced materials. This cooperative effort will harness diverse capacities to accomplish the venture and reduce cost to each participating school. Additionally, the respective DO - RH will serve as supply-chain links to facilitate downstream accession and utilization of the products.

With the assistance of Unicef, [33] locally operated pilot schemes have been developed that deploy locally sourced fabrics to produce re-usable sanitary pads in Nigeria. A set of 5 such pads cost four hundred and fifty Naira (N450) and each pad can be used and re-used for 12 months. This translates to N90/pad and a meager seven Naira, fifty kobo (N7.50) per month. This is affordable to all students. To take it a step further, we suggest that other Donors, civil society, communities and philanthropists partner with UNICEF for the mass production of these model pads and make them available, free of charge to all girl students. Rotary Club [34] has already commenced assistance in this regard.

iii). Provision of at least one OB14-CLCA type latrine in every school that lacks conventional latrine/toilets facilities.

To cover the gap created by inadequate WASH facilities in schools, we suggest the provision of OB14 Cheap Local Community Adapted (CLCA) type latrines in all schools lacking adequate conventional toilet facilities. Since this type of latrine is adapted to exclude direct monetary cost, at least

one unit of such latrine can be provided by mobilizing the students through direct labor. The latrine for girls should be cited at a location different from that of boys. This will guarantee that menstruators are able to conduct their MHM privately and conveniently, and in particular, dispose their menstrual pads with assurance of safety from the reach of suspected prowling ritualists.

5. Conclusion

Menstruation-associated school absenteeism among adolescent school girls in Jalingo was high. It affected their academic performance adversely and predisposed the girls to a greater tendency towards school drop-out. Intensive and extensive enlightenment, counseling and demonstration sessions on MHM, promoting universal access to free re-usable sanitary pads, and provision of cheap and affordable OB14-CLCA type latrines in schools are effective and sustainable remedies to menstruation-associated school absenteeism in a high resource-constrained setting such as Jalingo.

Competing Interest

The authors declare no competing interest.

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References

- [1] Davis, J., Macintyre, A., Odagiri, M., Suriastini, W., Cordova, A., Huggett, C. Menstrual hygiene management and school absenteeism among adolescent students in Indonesia: evidence from a cross-sectional school-based survey. *Tropical Medicine & International Health*, 2018, 23 (12), 1350–1363. <https://doi.org/10.1111/tmi.13159>
- [2] Geertz, A., Iyer, L., Kasen, P., Mazzola, F., & Petercon, K. An Opportunity to Address Menstrual Health and Gender Equity. FSG: Boston, MA, USA. 2016. *FSG Reimagining Social Change*, 1–48. <https://www.fsg.org/resource/opportunity-address-menstrual-health-and-gender-equity/>
- [3] House, S., Mahon, T., & Cavill, S. Menstrual hygiene matters: a resource for improving menstrual hygiene around the world. *Reprod Health Matters*, 2012, 21 (41), 257–259.
- [4] Sumpter, C., & Torondel, B.A Systematic Review of the Health and Social Effects of Menstrual Hygiene Management. *PLoS ONE*, 2013, 8 (4). <https://doi.org/10.1371/journal.pone.0062004> <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0062004>
- [5] Population Reference Bureau. 2013 World Population Data Sheet. Washington, DC: Population Reference Bureau. <https://www.prb.org/resources/2013-world-population-data-sheet/>
- [6] Tegegne, T. K., & Sisay, M. M. Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia. *BMC Public Health*, 14 (1), 2014. 1–14. <https://doi.org/10.1186/1471-2458-14-1118>
- [7] Sommer, M., Torondel, B., Hennegan, J., Phillips-Howard, P. A., Mahon, T., Motivans, A., *et al.* How addressing menstrual health and hygiene may enable progress across the Sustainable Development Goals. *Global Health Action*, 2021, 14 (1). <https://doi.org/10.1080/16549716.2021.1920315>
- [8] Tjon AT. Menstrual Hygiene: A Neglected Condition for the Achievement of Several Millennium Development Goals. Zoetermeer: Europe External Policy Advisors; *Europe External Policy Advisors*, 2007, 1–22. <https://archive.ids.ac.uk/bridge/global-resources/resource/A72821.html>
- [9] World Bank. Toolkit on Hygiene, Sanitation & Water in Schools: Gender Roles and Impact. Washington DC: The World Bank Group. 2005. <http://documents1.worldbank.org/curated/en/339381468315534731/pdf/410300PAPER0Hygiene0toolkit01PUBLIC1.pdf> Accessed September 18, 2022, @ 16.40 WAT.
- [10] Byford, T. Water, sanitation and hygiene standards for schools in low-cost settings. *Int J Environ Stud*, Volume 71, 2014 - Issue 3 pp. 409-410. <https://doi.org/10.1080/00207233.2014.913878>
- [11] Oster, E., & Thornton, R. Menstruation, sanitary products, and school attendance: evidence from a randomized evaluation. *Am Econ J Appl Econ*, 3 (1), 2011. pp 91–100. <https://doi.org/10.1257/app.3.1.91>
- [12] Vashisht, A., Pathak, R., Agarwalla, R., Patavegar, B. N., & Panda, M. School absenteeism during menstruation amongst adolescent girls in Delhi, India. *J Family & Community Med*, 25 (3), 2018. 163–168. https://doi.org/10.4103/jfcm.JFCM_161_17
- [13] Chinyama, J., Chipungu, J., Rudd, C., Mwale, M., Verstraete, L., Sikamo, C. *et al.* Menstrual hygiene management in rural schools of Zambia: a descriptive study of knowledge, experiences and challenges faced by schoolgirls. *BMC Public Health*, 19, 16 (2019). <https://doi.org/10.1186/s12889-018-6360-2>
- [14] Nnennaya, E. U., Atinge, S., Dogara, S. P., & Ubandoma, R. J. Menstrual hygiene management among adolescent school girls in Taraba State, Nigeria. *African Health Sciences*, 21 (2), 2021. pp 842–851. <https://doi.org/10.4314/ahs.v21i2.45>
- [15] Aucejio EM and Romano TF. Assessing the effect of school days and absence on test score performance. *Economics of Education Review* Vol 55, Dec 2016. Pp 70-87. <https://doi.org/10.1016/j.econedurev.2016.08.007>
- [16] Jessica D, Alison M, Mitsunori O, Wayan S *et al.* Menstrual hygiene management and school absenteeism among adolescent students in Indonesia: evidence from a cross-sectional school-based survey. *Tropical Medicine & International Health*, vol 23, Issue 2. Dec. 2018. pp. 1350–1363. [doi/10.1111/TMI.13159](https://doi.org/10.1111/TMI.13159) <https://onlinelibrary.wiley.com/doi/10.1111/tmi.13159>
- [17] Sivakami M, Maria Van Eijk A, Thakur H, Kakade N, *et al.* Effects of menstruation on girls and their schooling, and facilitators of menstrual hygiene management in schools: survey in government schools in three states in India. *Journal of Global Health*. 2019 June; 9 (1). doi: 10.7189/jogh.09.010408.

- [18] Ajari, E.; Abass, T.; Ilesanmi, E.; Adebisi, Y. Cost Implications of Menstrual Hygiene Management in Nigeria and Its Associated Impacts. *Preprints.org* 2021, 2021050349. <https://doi.org/10.20944/preprints202105.0349.v1>
- [19] Uche, R. D. Dropout Syndrome Among Girls in Secondary Schools and Human Resources Development in Nigeria. *Journal of Education and Practice*, 2013 vol.4. pp 25 – 30. <https://www.semanticscholar.org/paper/Dropout-Syndrome-among-Girls-in-Secondary-Schools-Uche/b01a5dbb220efd18afbabe48b60b3344c01b35c4>
- [20] Isamotu I. UNICEF: 1.3 Million Girls Drop Out of Junior Schools Annually in Nigeria. DAILY TRUST, October 11, 2021. <https://dailytrust.com/unicef-1-3-million-girls-drop-out-of-junior-schools-annually-in-nigeria/> Accessed June 19, 2022 @ 9.55 WAT.
- [21] Afisunlu, F. Nigeria has the highest number of school drop-outs- UN. Education Column, Daily Post, June 12, 2013. <https://dailypost.ng/2013/06/12/nigeria-has-highest-number-of-school-drop-outs-un/> Access June 19, 2022 @ 9.45 WAT.
- [22] Unicef. An Assessment of Menstrual Hygiene Management in Secondary Schools. Anambra, Katsina and Osun States, Nigeria 2015. Unicef. <https://unicef.org/nigeria/media/1256/file/Assessments-menstrual-hygiene-management-in-secondary-schools-2.jpg.pdf> Accessed December 13 2022 @ 2.45 WAT.
- [23] Daily Trust. Dealing with period poverty in Nigeria. Daily Trust, 26 June, 2022. <https://dailytrust.com/dealing-with-period-poverty-in-nigeria/> Accessed February 2023 @ 16.35 WAT.
- [24] BBC. Sanitary Pad: How High Cost Dey Affect Poor Household. BBC Online. 9 May 2019. By Igonikon K, Abu D, Ikpoyi Ufuoma G. <https://www.bbc.com/pidgin/media-48211797>. Accessed March 14, 2023 @ 23.10 WAT.
- [25] MACRO TRENDS. Nigeria Literacy Rate 1991-2022. <https://www.macrotrends.net/countries/NGA/nigeria/literacy-rate> Accessed June 26, 2022 @ 22.05 WAT.
- [26] Legit.ng. Literacy rate in Nigeria by states. 2022. <https://www.legitng/1161372-literacy-rate-in-nigeria-by-states-html>. Accessed June 26, 2022 @ 22.08 WAT.
- [27] Odunsi W. How Women Can Avoid Falling Victims of Ritualists - Group. Daily Post, March 27, 2019. <https://dailypost.ng/2019/03/27/women-can-avoid-falling-victims-ritualists-groups/> Accessed November 16, 2022 @ 17.20 WAT.
- [28] UNFPA. 5 ways the world is changing how it sees menstruation. News. 26 May 2022. <https://www.unfpa.org/news/5-ways-world-changing-how-it-sees-menstruation>. Accessed June 30, 2022 @ 08.45 WAT.
- [29] World Bank. Deep Structural Reforms Guided by Evidence are Urgently Needed to Lift Millions of Nigerians Out of Poverty. Press Release No. 2022/052/AFW. <https://www.worldbank.org/en/news/press-release/2022/03/21/afw-deep-structural-reforms-guided-by-evidence-are-urgently-needed-to-lift-millions-of-nigerians-out-of-poverty>. Accessed June 18, 2022 @ 9.40 WAT.
- [30] Adegboyega, A. Nigeria's Unemployment Rate Rises to 33.3% -Highest in Over 13 Years. PREMIUM TIMES. March 16, 2021. <https://www.premiumtimesng.com/news/headlines/449150-nigerias-unemployment-rate-rises-to-33-3-highest-in-over-13-years-html>. Accessed June 29, 2022 @ 7.10 WAT.
- [31] Olawoyin, O. Updated: 83 Million Nigerians Live in Poverty - NBS. PREMIUM TIMES, May 4, 2020. <https://premiumtimesng.com/news/headlines/391324-updated-83-million-nigerias-live-in-poverty-nbs.html> Accessed June 12, 2022 @ 9.10 WAT.
- [32] Anker Research Network. Rural. Nigeria 2020. Anker Living Income Reference Value for Rural Nigeria 2020. Anker Research Network & Global Living Wage Coalition. p.3 <https://globallivingwage.org/wp-content/uploads/2021/01/Rural-Nigeria-LI-Reference-Value.pdf> Accessed February 13, 2023 @ 12.10 WAT.
- [33] Unicef. No more limits: Girls learn how to make their own sanitary pads. Unicef Nigeria, 28 May 2018. <https://www.unicef.org/Nigeria/stories/no-more-limits-girls-learn-how-to-make-their-own-sanitary-pads>. Accessed June 25, 2022 @ 17.50 WAT.
- [34] Tribune. Girls Child Day: Rotary Club begins to subsidize sanitary pads. NIGERIAN TRIBUNE Online. October 12, 2021. <https://tribuneonline.com/girl-child-day-rotary-club-begins-to-subsidize-sanitary-pads/> Accessed January 17, 2023 @ 22.15 WAT.