

2017

School related violence, sanitation facilities at school, and menstrual hygiene management: What is the evidence for their effect on school attendance and learning, and how might population scientists advance this research agenda?

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Recommended Citation

Mensch, Barbara. 2017. "School related violence, sanitation facilities at school, and menstrual hygiene management: What is the evidence for their effect on school attendance and learning, and how might population scientists advance this research agenda?" presentation at the National Academy of Sciences meeting: "The Demographic Effects of Girls' Education in Developing Countries," 12 May.

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*National Academy of Sciences Meeting, Irvine CA :
The Demographic Effects of Girls' Education in
Developing Countries, May 12, 2017*

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SCHOOL RELATED GENDER BASED VIOLENCE

School-related gender based violence (SRGBV)

- “[V]iolence in schools in the poorer countries is an under-researched topic.” (Dunne, Humphreys and Leach 2006)
- Definition (UNESCO & UNGEI 2015)
 - “Acts or threats of sexual, physical or psychological violence occurring in and around schools, perpetrated as a result of gender norms and stereotypes, and enforced by unequal power dynamics.”
 - Psychological (insults, humiliation, neglect, discrimination, bullying)
 - Physical (corporal punishment, fighting)
 - Sexual (harassment, rape, assault, intimidation)
- Why “gender-based”? (Parkes 2016)
 - “Unequal gender relations... frequently at the root of violent acts”
 - Even when male on male, “conforming to normative conceptions of masculinity”

Mechanisms linking SRGBV to educational outcomes

- SRGBV “**can** have serious and long term consequences” on:
 - Loss of confidence and self esteem
 - Impaired physical and psychological health
 - Early and unintended pregnancy
 - Depression
 - Aggressive behaviors
 - Inability to concentrate in school and on homework
 - Low student participation in class
 - Poor attitudes toward education
 - Lack of engagement in school
 - Reduced learning
 - Absenteeism and dropout

(Parkes et al. 2013; RTI 2013)

Measurement Issues

- Considerable variability in what is assessed and how measured
 - SACMEQ: 28 questions to school heads in 2000 & 2007 about perceived occurrence of school violence perpetrated by teachers & pupils
 - TIMSS (2011) measured 4th and 8th grade achievement in 63 mostly developed countries; 6 questions to students about bullying (as victim)
 - CDC (2011) developed compendium of assessment tools for bystander, bully and victim scales; did not identify a concise set of items
- School surveys miss those who may have dropped out due to SRGBV
- Household surveys typically ignore SRGBV; focus on domestic violence
- Prevalence: assumed to be ubiquitous
 - “reports have proliferated on widespread violence experienced by girls and boys in and around schools across the globe”(Parkes et al. 2013)
 - “There is no doubt ... that it is a widespread phenomenon (Dunne, Humphreys and Leach 2006)

Evidence for effect of SRGBV on educational outcomes?

- “...notable shortage of large-scale quantitative studies on the impact of school violence on academic achievement from developing countries.” (RTI 2013)
- Cited evidence often from cross sectional studies:
 - TIMSS 2011: 32% of 4th graders & 29% of 8th graders reported being bullied monthly; Inverse association between self-reports of being bullied & math achievement (Mullis et al. 2012)
 - SACMEQ 2007: 8 countries, negative association between perceived violence & scores on reading, math & HIV knowledge; 4 countries positive association; little association with absenteeism (Saito 2013)
- Longitudinal evidence:
 - Malawi Schooling & Adolescent Study (MSAS) 2007-2013, aged 14-16 at baseline (Psaki, Mensch and Soler-Hampejsek 2017)
 - » Investigated effect of school violence on absenteeism, learning & dropout in same & subsequent school year
 - » By 2011, 70% of girls & 76% of boys had experienced school violence
 - » Effect on outcomes inconsistent

Observations on SRGBV studies

- Most cross sectional;
- Measurement of school violence problematic: who perceives and reports violence?
- Boys equally likely to be victims as girls (more likely to be bullied than girls; RTI 2013); thus, unless a gender difference exists in effect of SRGBV on education outcomes, SRGBV unlikely to explain gender differences in those outcomes.

Observations on SRGBV (continued)

- While interventions have been conducted to reduce SRGBV (e.g. “Good School Toolkit” Devries et al. 2015; Kyegombe et al. 2017); few quantitative studies in low income countries have investigated links between SRGBV & educational outcomes
- When violence is ubiquitous & takes place at home as well as school, how large an effect is it likely to have on education outcomes?
- Few studies acknowledge that associations between SRGBV & education may reflect shared underlying characteristics (e.g. community violence, chaotic learning environments, resource poor schools, inadequately trained teachers & administrators)

Research agenda to investigate effect of SRGBV on attendance, dropout and learning

- Develop concise set of validated indicators of GBV both domestic & school related
- Design studies that address endogeneity:
 - Look for policy shift likely effective in reducing SRGBV;
or
 - Conduct RCT
- Collect data on both domestic & school related GBV
- Include male as well as female students

SANITATION AND MENSTRUAL HYGIENE MANAGEMENT

“Poor sanitation in schools limits school attendance and retention of students ... School drop-out and low literacy rates, especially among the girl children, can be largely attributed to poor sanitation”

Rose Lidonde, Water, Engineering and Development Centre, Loughborough University UK, School Sanitation and Hygiene Education Symposium, June 9-10 2004, Delft, The Netherlands(cited in Birdthistle et al. 2011)

“I visited Kenya once and we looked at the different rates of girls going to school and the reason why many of them were not going to school was because they started their regular monthly period and they didn’t have the sanitation to be able to look after themselves. And they didn’t have toilets in school, separate toilets for girls, so they stopped going to school.”

Dr. Babatunde Osotimehin, Executive Director of UNFPA, Remarks at Oslo Summit on Education for Development July 7, 2015.

Sanitation facilities

Mechanisms linking access to sanitation facilities to educational outcomes

- Inadequate water, sanitation & hygiene (WASH) in schools said to result in adverse health & cognitive outcomes and reported to increase absenteeism due to:
 - Diarrheal & gastrointestinal diseases, RTIs
 - Inability to manage menstruation
 - Lack of privacy/safety/embarrassment

(Jasper et al. 2012; Jordanova et al. 2015; Birdthistle et al. 2011)

WASH data

- While there is increasing policy emphasis on inadequate school sanitation, reliable & systematic data on WASH lacking.
 - Of 60 developing countries surveyed by UNICEF in 2011, only 33 provided data on access to water in primary schools; only 25 provided toilet data
 - Of countries that provided data, < 1/2 reported access to water & toilets

https://www.unicef.org/media/files/raisingcleanhands_2010.pdf

Evidence for effect of sanitation facilities on educational outcomes?

Despite assertions that inadequate sanitation facilities major cause of girls' absenteeism and dropout, very few empirical studies support this.

Systematic Reviews:

- Effects of water & sanitation in schools on health & absenteeism (Jasper, Le and Bartram 2012).
 - 3485 identified; 47 met inclusion criteria (peer reviewed & explored effect of availability of water and/or sanitation)
 - 16 from low income countries
 - Higher rates of infectious, gastrointestinal, neuro-cognitive and psychological illnesses and absenteeism (due to menses) observed where water & sanitation facilities inadequate
 - However, only 2 RCTs from low income countries; included studies with relatively weak designs
- Effect of provision of separate toilets for girls on primary & secondary enrollment, attendance & completion in low income countries (Birdthistle et al. 2011)
 - 5741 identified; 70 met inclusion criteria
 - did not find any study that “assessed the impact of separate sex toilets on either educational or health outcomes”

Evidence for effect of sanitation facilities at school on educational outcomes? (continued)

RCT conducted in 2007-8 investigated effect of school-based WASH program in western Kenya on pupil absenteeism (Freeman et al. 2012)

- Public primary schools (N=135) randomly assigned to 1 of 3 arms:
 1. Water treatment & hygiene promotion (handwashing & drinking water containers, 1 year supply of chlorine based water disinfectant; teacher training),
 2. Arm 1 + latrines meeting government standards,
 3. Control arm
- Both intervention arms had significant improvement in attendance rates for girls but not for boys
- However, provision of latrines in Arm 2 did not lead to additional improvement in girls' attendance

Evidence for effect of sanitation facilities at school on educational outcomes? (continued)

India: Did enrollment & test scores improve more for schools that received a latrine, and did type of latrine – unisex or sex-specific – matter? (Adukia 2017)

- **Background:** In 2002, $< \frac{1}{2}$ of Indian schools lacked basic sanitation facilities
- **Data:** 3 yr (2002-2005) panel $> 100,000$ primary schools (grades 1-5) & $\approx 18,000$ upper primary schools (grades 6-8)
- **Design:** Took advantage of national school latrine construction initiative
- **Methods:** Differences-in-differences controlling for initial school characteristics (i.e. controlled for year-interacted baseline enrollment and infrastructure)
- **Results:**
 - Latrine construction increased enrollment; effect greater for lower primary (ages 5-9) than upper (ages 10-16)
 - Single sex latrines increased female enrollment in upper primary; any type of latrine benefited younger girls and boys
 - Academic test scores not affected by latrine construction

Research Agenda

- More intervention studies needed to determine whether type, privacy & cleanliness of toilets, and availability & quality of water at school, affect absenteeism, dropout & learning.
- Considerations:
 - Identify:
 - WASH interventions to evaluate, or
 - Natural experiments
 - Examine effects on males as well as females, younger as well as pubescent students to determine whether adolescent girls differentially affected by quantity/quality of sanitation facilities.
 - Collect data on water & toilet facilities at home as well as at school

Menstrual hygiene management (MHM)

A recent AJPB paper discusses "rapid advancement of the MHM agenda for schoolgirls around the world" asserting that "those working in public health might benefit from finding ways to focus on the social nature of the problems **rather than solely focusing on the empirical evidence.**" (Sommer et al. 2015)

- Mechanisms linking MHM to educational outcomes (absenteeism and learning):
 - Inadequate sanitary materials
 - Unhygienic sanitary materials causing RTIs (bacterial vaginosis (BV) & candidiasis)
 - Limited access to toilets, water & soap to change/wash sanitary napkins, cloths
 - Physical discomforts (e.g. cramps, headache, diarrhea; absence of analgesics)
 - Cultural taboos (restrictions on diet & activities)

What's the evidence for the effect of MHM on educational outcomes?

Quantitative research on whether menstruation causes absenteeism is inconclusive.

Observational data:

- MSAS (2007-2013): R1 analysis school sample; N=1,675 males and females, aged 14-16; (Grant, Lloyd and Mensch 2013)
 - Menstruation-related absenteeism did not create female disadvantage in attendance; no significant gender difference absenteeism.
 - School-level variables (including toilet type, toilet cleanliness, source of school water) were not significantly associated with menstruation-related absenteeism
- Meta-analysis of 138 MHM observational studies in India 2000-2015 (van Eijk et al. 2016)
 - 64 reported on absenteeism; $\approx 25\%$ of females reported missing 1+ school days during menstruation;
 - substantial heterogeneity across studies
 - quality of studies varied considerably

Systematic reviews of evidence linking MHM to health, psycho-social and educational outcomes

- Effect of MHM on health & psycho-social outcomes (Sumpter & Torondel 2013):
 - Cross-sectional, case control, cross-over, qualitative, interventions with various designs (before & after, controlled & uncontrolled)
 - 1924 identified; 24 met inclusion criteria
 - Methodologies “varied greatly and overall quality was low”
 - No associations found with health outcomes including BV
 - No studies investigated effect of pain medication
- Effect of MHM interventions on education and psychosocial outcomes (Hennegan & Montgomery 2016)
 - RCTs as well as non RCTs & controlled before/after studies eligible for inclusion
 - 10,680 identified; 8 met inclusion criteria
 - 3 hardware: menstrual cups, disposable or reusable sanitary pads, improved WASH
 - 5 software: education to improve understanding of menstruation, and MHM practices
 - Only the 3 hardware interventions investigated school attendance; significant effects not found

“Nia Project” funded by The Bill and Melinda Gates Foundation through Grand Challenges

“ ... gap in the evidence for high quality randomized intervention studies which combine hardware and software interventions, in particular for better understanding the nuanced effect improving MHM may have on girls’ attendance at school,” (Sumpter and Torondel 2013.)

- School based intervention for girls in penultimate year of primary school in Kilifi County, Kenya conducted by ZanaAfrica Foundation
 - Sanitary Pads:
 - 1 pack of Nia Teen pads distributed monthly
 - Underwear distributed once per term
 - RH Education
 - Bi-monthly girls-only sessions conducted in school, led by trained facilitator
 - Nia Teen magazine distributed once per term
- Evaluation being conducted by Population Council (PI Eunice Muthengi + Karen Austrian)

NIA RCT Design

Arm 1 35 schools	Arm 2 35 schools	Arm 3 35 schools	Arm 4 35 schools
Control (No intervention)	Sanitary Pads	Reproductive Health Ed	Sanitary Pads Reproductive Health Ed

Nia Research Questions

- What is effect of MHM intervention combining software (RH education) & hardware (sanitary pads) vs. software or hardware alone on:
 - School attendance & participation (concentration; active class involvement)
 - Primary completion
 - Progression to secondary
 - Literacy & numeracy
 - RH knowledge
 - Menstrual health knowledge and hygiene
 - Financial literacy
 - GBV
 - Self efficacy
 - Sexual behavior
 - Pregnancy prevention & contraception
- What is cost-effectiveness of combined approach, compared to either software or hardware approaches alone?

NIA Evaluation

- N~3,500 girls starting class 7 in 140 schools in Kilifi County
- Longitudinal 2-year study following girls until completion of primary school
- Interventions implemented for 5 school terms (3 months each)
- School attendance collected via cell phones from boys and girls for 5 weeks per term
- Timeline:
 - Baseline completed April 2017
 - Intervention May 2017- December 2018
 - Endline March 2019

Final observations

- Assertions abound regarding detrimental effects of SRGBV, poor sanitation facilities & inadequate MHM on educational outcomes; yet rigorous quantitative evidence for such effects limited or non-existent.
- Of 3 factors explored here, current evidence — based on Kenya WASH RCT & India latrine construction initiative — is strongest, albeit still limited, for sanitation facilities; while these 2 studies found effects on attendance, no evidence yet improving sanitation will enhance learning.
- Well designed impact evaluation studies needed to inform policies & programs

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