Research article

Violence against children perpetrated by peers: A cross-sectional school-based survey in Uganda

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A R T I C L E   I N F O

A B S T R A C T

Violence against children by peers is a global public health problem. We aimed to assess factors associated with peer violence victimization among primary school children in Uganda. We conducted multilevel multivariable logistic regression analyses of cross-sectional data from 3706 primary students in 42 Ugandan primary schools. Among primary school students, 29% and 34% had ever experienced physical and emotional violence perpetrated by their peers, respectively. Factors strongly associated with both physical and emotional violence were similar and overlapping, and included exposure to interparental violence, having an attitude supportive of violence against children from school staff, not living with biological parents, working for payment, and higher SDQ score. However, we found that younger age, sharing sleeping area with an adult and achieving a higher educational performance score, were specifically associated with physical violence. On the other hand, being female, walking to school, reporting disability and eating one meal on the previous day, were particularly associated with emotional violence. Interventions to reduce peer violence should focus on family contexts, school environments and those with poor socio-economic status may need extra support.

1. Background

Violence against children, including physical, sexual and emotional violence, has devastating effects on health, including injuries, sexually transmitted infections, depression, substance misuse, self-harm and non-communicable diseases (Felitti et al., 1998; Lim et al., 2012; Norman et al., 2012; Norton & Kobusingye, 2013). Peer victimization is a key risk factor for child and adolescent mental health problems and suicide, with psychological manifestations extending into adulthood (Copeland, Wolke, Angold, & Costello, 2013; Fergusson & Lynskey, 1997; van Geel, Vedder, & Tanilon, 2014).

Research suggests that over half the world's children – 1 billion aged 2–17 years – experienced some form of violence in the past

year, of whom, 230 million live in Africa (Hillis, Mercy, Amobi, & Kress, 2016). Perpetrators of violence against children include school staff, family members and peers. Violence against children by their peers can include both "bullying", where the power dynamics between a perpetrator and victim are important, and "peer victimization", which can include any violence between peers (Devries, Child et al., 2014).

Studies, mainly from high-income settings, indicate that children who are maltreated (abused or neglected physically, emotionally or sexually), exposed to domestic violence, or from socio-economically disadvantaged households and communities may be more vulnerable to violence from school peers (Cluver, Bowes, & Gardner, 2010; U.S. Department of Education, 2002; Shields & Cicchetti, 2001; Wolkes, Woods, Stanford, & Schulz, 2001).

In sub-Saharan Africa, high levels of violence against peers have been reported. Data from the Global School-Based Health Survey showed that the prevalence of being bullied on at least one day during the past month ranged from 25% in Tanzania to 63% in Zambia, and that bullying was associated with school absence or dropout, sleep problems, and having multiple sexual partners, as well as mental health problems (Brown, Riley, Butchart, & Kann, 2008; Siziya, Muula, & Rudatsikira, 2007).

Little is known about the prevalence and factors associated with different types of violence against peers, particularly in sub-Saharan African settings where violence against children is common. In Uganda, a recent study showed that more than 90% of primary school-aged children had ever experienced physical violence, more than 50% reported emotional abuse, and 4% and 13% of boys and girls respectively reported sexual abuse from a school staff member (Devries, Child et al., 2014). In this study, we examine the prevalence and factors associated with physical, sexual and emotional peer victimization among children in Uganda.

2. Methods

We used data from the baseline survey of the Good Schools Study (GSS), a cluster-randomized controlled trial, which evaluated an intervention to reduce violence against children by school staff. The study was conducted by Raising Voices (a Ugandan non-governmental organization), Makerere University, University College London (UCL) Institute for Education and the London School of Hygiene and Tropical Medicine. The study took place in rural and urban areas of Luwero district. The protocol and main trial results are published elsewhere (Devries et al., 2013; Devries et al., 2015b).

2.1. Sampling

The Good Schools Study baseline survey was conducted in primary schools during June and July 2012. From 268 schools in Luwero, 97 schools were excluded due to having fewer than 40 registered students in Primary 5, and 20 schools were left out because they had existing government interventions. The remaining 151 schools contained 80% of Primary (P) 5, 6, and 7 students in the district (aged about 11–14 years). These schools were stratified according to the gender ratio of students (> 60% girls, > 60% boys or an approximately equal ratio) (Devries et al., 2013; Devries, Child et al., 2014).

Forty-two schools were randomly selected proportional to strata size. All selected schools agreed to participate. In each school, up to 130 students across P5-7 were randomly sampled. In schools with fewer than 130 students in P5-7, all students were invited to participate. Data was obtained from 77% of sampled students; 19% were absent from school during the week of data collection; and 4% refused, were ineligible or had a parent who opted them out (Devries et al., 2013; Devries, Child et al., 2014).

2.2. Procedure

Head teachers gave consent for their school's participation and notified staff, students and parents. Individual children provided written consent to participate however, parents could choose to opt their child out of the study. Data were collected through private face-to-face interviews conducted by trained interviewers. The three-week intensive training as well as debriefs and supervision that focused on data quality during the data collection supported production of reliable data.

A child protection plan was developed by liaising with local services to support children who were at risk, or needed any services related to violence. In addition, a trained counsellor was available to any child who requested counseling during or after the interview process (Child, Naker, Horton, Walakira, & Devries, 2014). Ethical approval for the study was obtained from the London School of Hygiene and Tropical Medicine and the Uganda National Council of Science and Technology.

2.3. Instruments and measures

2.3.1. Exposure variables
Socio-demographic data including age of the child, whether the child ate three meals versus less than three meals in the past day and if the child did paid or unpaid work were collected.

Educational performance was measured by word recognition tests in English and Luganda (scoring 1–40), timed reading tests in English and Luganda (scoring 1–62) and reading comprehension tests in English and Luganda (scoring 1–5). Tests administered in groups were silly sentences (testing reading and cognitive ability, scoring 1–20), spelling in English (scoring 1–20) and basic mathematics (scoring 1–40). Educational performance score relative to peers was computed by adding up the number of times a student scored in the bottom third of the overall distribution for each individual educational test, divided by the number of completed tests. Those in the bottom 10% of students from this distribution were coded as "low performers" and those in the top 90% as "not low performers." (Devries, Child et al., 2014).

Table 1
Measurement of peer violence variables in the baseline survey.

Outcome variables	Items used	Coding
Physical violence	Has anyone besides a school staff member ever: • Twisted your arm or any other body part, slapped you, pushed you or thrown something at you? • Punched you, kicked you, or hit you with a closed fist? • Hit you with an object, such as stick or cane or whipped you? • Cut you with a sharp object or burnt you?	Coded 1 if answered yes to any item and the perpetrator was either male or female student Coded 0 otherwise
Emotional violence	Has anyone besides a school staff member ever: • Insulted, called you rude or hurtful names? • Accused you of witchcraft? • Locked you or made you stay outside? • Not given you food?	Coded 1 if answered yes to any item and the perpetrator was either male or female student Coded 0 otherwise
Sexual violence	Has anyone besides a school staff member ever: • Disturbed or bothered you by making sexual comments about you? • Kissed you when you didn't want them to? • Touched your genitals or breasts when you didn't want them to, or in a way that made you uncomfortable? • Threatened or pressured you to make you do something sexual with them? • Made you have sex with them, because by threatened or pressured you? • Had sex with you, by physically forcing you?	Coded 1 if answered yes to any item and the perpetrator was either male or female student Coded 0 if answered no to all items

Selected exposure variables	Items used	Coding
Attitudes to violence to physical, emotional and sexual violence against children in school	• Teachers must hit students to make them listen • Students should fear their teachers • Teachers must hit students to make them learn • If a teacher, older man or boy says sexual comments to a girl, it is her fault • Name calling or insulting of students by teachers is acceptable behavior • Some female students date teachers for them to buy things • It is ok for a teacher to have sex with a female student if she gives consent	• 4 = all the time • 3 = most of the time • 2 = sometimes • 1 = never • . = DK, NR, NA Coded as a continuous variable by summing up all the statements to form a score of 7–28
Exposure to interparental violence	• Have you ever seen or overheard your parents or caregivers shouting at each other? • Have you ever seen or overheard your father hit or beat your mother?	Coded 1 if answered yes to any item Coded 0 if answered no to all items
Reported a disability	• Do you have any mental or physical disability? For example, do you have trouble seeing, walking, speaking, fits, or anything else? Response options: None, Trouble seeing, Trouble hearing, Trouble walking/with movement, Trouble with speech, Fits, Other.	Coded 1 if answered yes to any of the items; 0 if answered no to all items.

The Strengths and Difficulties Questionnaire (SDQ) was used to assess symptoms of common mental disorders, including symptoms of depression, anxiety and conduct disorder (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000). The SDQ has been used and validated in numerous countries including Africa (Goodman et al., 2000). We calculated a total SDQ score by summing responses to 20 items. Each item was a statement about a particular mental health symptom and children were asked if they thought the statement was "Not true", "Somewhat true" or "Certainly true". The maximum range of scores was 0–30.

Disability status was measured by asking children whether they had any mental or physical disability, for example, if they had trouble seeing, walking, speaking, fits, or anything else? The response options were: None, Trouble seeing, Trouble hearing, Trouble walking/with movement, Trouble with speech, Fits, and Other. Children who answered yes to any of the items were coded 1 (disabled) and 0 (not disabled) if answered no to all items (Devries, Kyegombe et al., 2014).

Children were asked about whether they had been exposed to interparental violence (saw or overheard father beat mother or parents shouting at each other), and about their attitudes towards violence from school staff. A scale was constructed to measure attitudes, which comprised seven statements such as 'Teachers must hit students to make them listen' and 'If a teacher, older man or boy says sexual comments to a girl, it is her fault'. Students answered whether the statements applied all the time (scoring 4), most of the time (scoring 3) sometimes (scoring 2) or never (scoring 1). Scores for each statement were summed to generate a continuous variable ranging from 7 to 28. In the analysis, a higher score implied accepting attitudes towards violence and vice versa. Details of questions included are summarized in Table 1.

2.3.2. Outcome variables

The two outcome variables were peer physical and emotional violence victimization. Lifetime and past week experiences of physical, sexual and emotional violence against children were measured using items from the International Society for the Prevention

Table 2
Descriptive characteristics of primary school students (n = 3706) in Luwero district, Uganda.

Characteristic	Male Percent	Female Percent	Total Percent
Age in years[*]	M = 13.24, SD = 1.53	M = 12.79, SD = 1.39	M = 13.01, SD = 1.47
Lives with biological parents	60.0	64.7	62.5
Transport to school[**]			
Other	5.6	2.3	3.8
Walking alone	25.8	23.5	24.6
Walking with someone you know	62.1	65.5	63.9
Board at school	6.6	8.7	7.7
Reported a disability	7.9	6.8	7.3
Number of meals eaten yesterday[***]			
1 meal	13.0	14.8	13.9
2 meals	43.2	35.1	38.9
3+ meals	43.8	50.2	47.1
Number of children sharing sleeping area			
None	25.0	19.9	22.4
1 other child	28.0	29.0	28.5
2 or more other children	47.0	51.1	49.1
Number of adults sharing sleeping area			
None	75.7	73.8	74.7
1 adult	17.4	17.6	17.5
2 or more	7.0	8.7	7.9
Ever worked for payment	56.6	14.7	34.7
Attitudes supporting violence from school staff scores	M = 13.18, SD = 3.66	M = 12.83, SD = 3.34	M = 12.99, SD = 3.5
Exposed to interparental emotional or physical violence	26.1	25.7	25.8
High educational performance	89.4	90.2	89.8
SDQ score	M = 9.11, SD = 5.37	M = 9.55, SD = 5.26	M = 9.34, SD = 5.32
Total	100.0	100.0	100.0

M = Mean, SD = Standard Deviation.
  [*] 5 missing cases.
  [**] 84 missing cases.
  [***] 1 missing case.

of Child Abuse and Neglect (ISPCAN) and drawing on the WHO multi-country study on women's health and domestic violence against women (Garcia-Moreno, Ellsberg, Heise, & Watts, 2005; Zolotor et al., 2009).

Emotional violence included some measures of neglect including "being denied food" and "being insulted" (Devries, Child et al., 2014), since they are closely related and used in its definition (Glaser, 2002). For each question about violence, children were asked who was the perpetrator. "Being denied food" and "being insulted" is a form of neglect and verbal abuse respectively. We conceptualized these measures under the general definition of emotional violence in line with Good Schools Study design and previous analysis. We included questions on child neglect and verbal abuse in the measurement of "emotional violence" since they are closely related and are frequently included as a form of emotional abuse in literature (Devries et al., 2015a; Devries, Kyegombe et al., 2014).

"Peer violence" was defined as experiencing any act of physical, emotional or sexual violence perpetrated by male or female peers at school. Table 1 shows how violence variables were coded.

2.4. Statistical analysis

Descriptive statistics for students' socio-demographic characteristics, as well as prevalence statistics for different forms of peer violence at school were produced. Two multilevel and multivariable logistic regression models were fitted to identify factors associated with peer physical and emotional violence. The multivariable models accounted for clustering by adding random effects at the school level. We did not analyze data for sexual violence from peers because of the relatively low prevalence (3.2%) in the study population as indicated in Table 2.

All exposures were included in the models at the same time to adjust for socio-demographic factors and violence related variables. Exposure variables included in the models were selected based on findings from a review of global literature on violence against children and on knowledge of the local context. Multi-collinearity tests were conducted among selected exposure variables. Variables with missing data (< 1.0%), are reported. All analyses were conducted in STATA version 13 (StataCorp, 2013).

Table 3
Prevalence of violence by peers among primary school students in Luwero district, Uganda.

	Male[a] n (%)	Female[b] n (%)	Total[c] n (%)
Physical violence, lifetime	536 (30.3)	546 (28.2)	1082 (29.2)
Physical violence, past week	131 (7.7)	181 (9.3)	318 (8.6)
Emotional violence, lifetime	657 (37.1)	612 (31.6)	1269 (34.2)
Emotional violence, past week	303 (17.1)	297 (15.3)	600 (16.2)
Sexual violence, lifetime	35 (2.0)	83 (4.3)	118 (3.2)
Sexual violence, past week	10 (0.6)	24 (1.2)	34 (0.9)
Any of the three forms of violence, lifetime	863 (48.8)	891 (46.0)	1754 (47.3)
Any of the three forms of violence, past week	372 (21.0)	410 (21.2)	782 (21.1)

[a] n = 1769.
[b] n = 1937.
[c] n = 3706.

3. Results

3.1. Children's characteristics

Data were collected from 3706 children whose characteristics are presented in Table 2. The children had a mean age of 13 years (standard deviation, SD, 1.5) and more than half (52%) were girls. More than half (63%) of the children lived with their biological parents. A quarter (25%) and almost half (47%) of the children walked alone to school and ate at least three meals during the previous day respectively. Seven percent of children reported some form of disability. The mean SDQ score was 9.34 (SD = 5.32).

3.2. Attitudes and exposure to peer violence

The mean score for supportive attitudes towards physical violence from school staff was 12.99 (SD = 3.50) and 26% had been exposed to interparental violence (Table 2). Almost half (47%) of the children had ever experienced any form of violence by peers and 21% experienced violence by peers in the past week (Table 3).

Almost a third (29%) of the children had experienced physical violence perpetrated by peers in their lifetime, and 8.6% in the past week. The prevalence of lifetime and past week physical violence was similar for boys and girls. A third (34%) had peer emotional violence victimization in their lifetime, and less than a fifth (< 18%) were victimized in the past week. The lifetime prevalence of peer sexual violence victimization was relatively low (3%). However, girls reported a higher prevalence compared to the boys (4% vs 2%). Past week sexual victimization by peers was very low (< 1%).

3.3. Factors associated with physical peer violence victimization

Multivariable and multilevel logistic regression models were fitted to identify factors associated with peer physical and emotional violence victimization (Table 4). Increment in age by one year reduced the odds (aOR 0.86, 95% CI 0.82–0.91) while not living with biological parents increased the odds (aOR 1.17, 95% CI: 1.00–1.38) of experiencing physical violence. Children who shared a sleeping area with one adult (aOR 1.23, 95% CI: 1.01–1.50) and had ever worked for payment (aOR 1.28, 95% CI: 1.07–1.53) were more likely to report lifetime peer physical violence victimization.

We also found that having an attitude supportive of physical violence from school staff (aOR 1.03, 95% CI: 1.00–1.05), exposure to interparental violence (aOR 1.92, 95% CI: 1.62–2.27) and being a high educational performer (aOR 1.36, 95% CI: 1.05–1.77), were associated with peer physical violence victimization. Also, having a higher SDQ score (aOR 1.05, 95% CI: 1.03–1.06), was associated with lifetime peer physical violence victimization suggesting an important association between mental health problems and exposure to peer physical violence victimization. Risk of peer physical violence victimization did not significantly differ by sex or disability status.

3.4. Factors associated with emotional peer violence victimization

Peer emotional violence victimization was associated with being a girl (aOR 1.21, 95% CI: 1.03–1.43), not living with biological parents (aOR 1.22, 95% CI: 1.04–141), and walking alone (aOR 1.68, 95% CI: 1.06–2.66), or with someone (aOR 1.83, 95% CI: 1.17–2.86) to school, compared to other forms of transport to school.

We also found that reporting a disability (aOR 1.34, 95% CI: 1.02–1.76), eating only one meal on the previous day (aOR 1.26, 95% CI: 1.01–1.57), and having ever worked for payment (aOR 1.36, 95% CI: 1.15–1.62), were independently associated with emotional peer violence victimization.

Having a supportive attitude towards violence from school staff (aOR 1.04, 95% CI: 1.02–1.06), exposure to interparental violence (aOR 1.29, 95% CI: 1.09–1.52) and SDQ score (aOR 1.05, 95% CI: 1.03–1.07), were independently associated with peer violence victimization. Age and educational performance did not predict emotional violence victimization.

Table 4

Multivariable logistic regression of lifetime peer physical and emotional violence victimization among primary school students in Luwero, Uganda.

	Physical violence victimization, lifetime		Emotional violence victimization, lifetime	
	aOR	95% CI	aOR	95% CI
Sex (Male)	1.06	0.89–1.26	1.21[*]	1.03–1.43
Age in years	0.86[***]	0.82–0.91	0.95	0.90–1.00
Does not live with biological parents	1.17[*]	1.00–1.38	1.22[*]	1.04–1.41
Transport to school (Other)				
Walking alone	1.29	0.80–2.06	1.68[*]	1.06–2.66
Walking with someone you know	1.45	0.92–2.29	1.83[**]	1.17–2.86
Board at school	0.94	0.55–1.61	1.35	0.80–2.27
Reported a disability (No)	1.11	0.83–1.48	1.34[*]	1.02–1.76
Number of meals eaten yesterday (3+ meals)				
1 meal	0.94	0.75–1.19	1.26[*]	1.01–1.57
2 meals	0.97	0.82–1.15	0.97	0.83–1.14
Number of children sharing a sleeping area (None)				
1 other child	1.18	0.94–1.47	1.15	0.93–1.42
2 or more other children	1.18	0.96–1.45	1.12	0.92–1.36
Number of adults sharing a sleeping area (None)				
1 adult	1.23[*]	1.01–1.50	0.97	0.80–1.18
2 or more	1.01	0.76–1.33	0.99	0.76–1.30
Ever worked for payment (No)	1.28[**]	1.07–1.53	1.36[***]	1.15–1.62
Attitudes supporting violence from school staff scores	1.03[*]	1.00–1.05	1.04[***]	1.02–1.06
Exposed to interparental emotional or physical violence (No)	1.92[***]	1.62–2.27	1.29[**]	1.09–1.52
Higher educational performance (low)	1.36[*]	1.05–1.77	1.10	0.86–1.41
SDQ scores	1.05[***]	1.03–1.06	1.05[***]	1.03–1.07

Parenthesis = reference categories, aOR = adjusted Odds Ratios for all exposures, CI = confidence intervals.

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

4. Discussion

We found that at least almost half (47%) of primary school children in Luwero had experienced any of the three forms of peer violence (physical, emotional or sexual) by peers in their lifetime and that 21% had been exposed in the past week. The prevalence of peer violence victimization among students in other African settings ranged from 58% in Zimbabwe to 63% in Zambia (Fleming & Jacobsen, 2010). Previous studies have shown that most children in Luwero have experienced some form of physical violence by a school staff member in their lifetime (Devries, Child et al., 2014). The high prevalence of self-reported peer violence among school children could be attributed to high level of awareness attributed to several interventions addressing gender-based violence in Uganda (Abramsky et al., 2012).

Factors strongly associated with both physical and emotional violence were similar and overlapping, and included exposure to interparental violence, having an attitude supportive of violence against children from school staff, not living with biological parents, working for payment, and higher SDQ score. It is important to note that these factors were independently associated with either physical peer or emotional violence. However, we found that younger age, sharing sleeping area with an adult and achieving a higher educational performance score, were specifically associated with physical violence. On the other hand, being female, walking to school, reporting disability and eating one meal on the previous day, were particularly associated with emotional violence.

We found that a quarter of the children had been exposed to interparental violence, and more than half the children had attitudes supportive of violence from school staff. In this study, exposure to interparental violence and supportive attitudes towards violence against children, were independent risk factors for both physical and emotional violence peer victimizations. Several studies report that exposure to interparental violence during childhood leads to accepting/tolerating attitudes towards violence victimization in adolescence and adulthood, hence increased vulnerability to both aggression and victimization (Baldry, 2003; Bowes et al., 2009; Fergusson & Lynskey, 1997). These findings imply an intergenerational effect of violence, and the internalization and externalization of violent behaviors by children.

That children living without biological parents are at risk of both physical and emotional violence may be linked to poverty or social ostracization (MoGLSD, UNICEF and ODI, 2015). In addition, children who do not live with their biological parents are at higher risk of child maltreatment, which perpetuates an accepting attitude towards violence victimization (Bowes et al., 2009).

Working for money, eating only one meal on the previous day and walking to school, were independently associated with both peer physical and/or emotional violence victimization. These three exposures are an indication of poor socio-economic status of the children's households in Luwero district. Therefore, children from poor socio-economic backgrounds were more at risk of violence victimization by peers. Previous studies have demonstrated socio-economic inequalities in exposure to bullying, and found that the risk of bullying is higher where wide wealth disparities exist at a school and national level (Cluver et al., 2010; Due et al., 2009;

Shields & Cicchetti, 2001; Wolkes et al., 2001).

We found large effect sizes for SDQ score associated with both physical and emotional peer violence victimisations. Total strengths and difficulties questionnaire scores have been associated with peer violence victimization in South Korean pupils (Yang, Kim, Kim, Shin, & Yoon, 2006) and poor mental health outcomes (Kim, Koh, & Leventhal, 2005; Siziya, Rudatsikira, & Muula, 2012). However, due to the cross-sectional nature of our data, we are unable to infer the direction of causality. In reality, the relationship may be bi-directional: children with mental health problems may be picked on by their peers, and bullied children may be more likely to develop mental health problems.

Girls in our sample were at a higher risk of emotional violence than boys. In other studies, girls are more likely to be perpetrators and victims of emotional violence through malicious gossip and teasing (Azeredo, Levy, Araya, & Menezes, 2015; Carrera Fernandez, Fernandez, Castro, Failde Garrido, & Otero, 2013; Mazur & Malkowska, 2003; Silva, Pereira, Mendonça, Nunes, & de Oliveira, 2013) than boys. However, there were no gender differences in the experience of physical violence.

Every year increase in age decreased the odds of physical violence but not emotional violence. In other studies, younger children tend to be emotionally victimized by peers than older ones (Azeredo et al., 2015; Kubwalo, Muula, Siziya, Pasupulati, & Rudatsikira, 2013; Mazur & Malkowska, 2003). This finding has been reported in a review of 19 low- and middle-income countries (Fleming & Jacobsen, 2010) and is attributed to the "power imbalance when students of different ages attend the same classes" (Azeredo et al., 2015).

Disability increased the risk of emotional but not physical violence. Similar findings have been reported elsewhere (Devries, Kyegombe et al., 2014). Disability is associated with the need for attention and affection (Turner, Vanderminden, Finkelhor, Hamby, & Shattuck, 2011) and emotional challenges (Reiter, Bryen, & Shachar, 2007; Turner, Finkelhor, & Ormrod, 2010), which elevate the risk of violence victimization. Due to mobility limitations, disabled children are more likely to be isolated from the rest of the children or to have an adult care taker, which protects against physical violence but increases emotional disconnectedness. In addition, "stigma associated with disability, attitudes and traditional beliefs about disabilities, social isolation and the view that children with disabilities are often perceived as unworthy of dignity and respect, may also explain why children with disabilities are at greater risk of violence" (Devries, Kyegombe et al., 2014).

It was an unexpected finding that children with high educational performance were at a high risk of physical violence. We hypothesized that children with low education performance were at a high risk of violence victimization. Brier (1995) found that children who perform poorly were more likely to develop antisocial behavior than those who performed highly. Children who experience violence at school or by peers are more likely to perform poorly in their academics. The finding that children with high educational performance were more likely to experience violence is calls for further investigations using other study settings and designs in Uganda. The cross sectional nature of the data cannot provide enough basis for making concrete conclusions.

4.1. Implications

Girls were more at risk of peer emotional violence victimization than boys. Similar finding has been reported by other studies (Azeredo et al., 2015; Wang, Iannotti, & Nansel, 2009). Future studies should examine how patterns of exposure to emotional peer violence victimization differ between boys and girls. For example, are individuals more likely to perpetrate violence against peers of the same or opposite sex? Is the sex of the victim and or/perpetrator associated with the type of violence perpetrated? In addition, future interventions to prevent violence against children must account for sex differences in violence exposures, and for the fact that some individuals experience violence by different perpetrators in multiple settings (Clarke et al., 2016).

Our study confirms the association between peer physical and emotional violence victimization and mental health problems among children in Luwero. This suggests that mental health promotion may be an important pathway to reducing peer violence, however, this relationship may be complex. It may not be realistic to eliminate all forms of bullying from schools. However, it is feasible to build emotional resilience among students, whilst working towards reducing interpersonal violence and improving the school environment. School-based interventions that build psychological resilience have shown promise and could be incorporated into future school violence prevention programs in this setting (Tol et al., 2008).

4.2. Study limitations

Findings from this study should be interpreted in light of several limitations. First, in this study, we measured violence exposures perpetrated by peers. We were unable to assess whether exposures constituted 'bullying' as we did not assess power relationships between perpetrators and victims. Second, data were collected from students in primary schools in Luwero district and may not represent the experiences of children in other districts in Uganda or those who have dropped out of school. Third, there is a possibility of children under-reporting sexual violence due to stigma and trauma. Fourth, analyses are based on cross-sectional data, which makes it difficult to infer the direction of causality between violence and associated risk factors.

4.3. Conclusions

Violence against children by their peers is common in Luwero. Factors independently associated with lifetime exposure to both peer physical and emotional violence among children in primary schools in Luwero Uganda included: exposure to interparental violence, having an attitude supportive of violence against children from school staff, not living with biological parents, working for payment, and higher SDQ score.

Interventions are needed to address the burden of violence in schools such as the Good School Toolkit (Devries et al., 2015b). Such interventions should address the root causes of violence including socio-economic conditions of the children, in order to ensure students' safety, health, and a supportive learning environment. Future research could examine associations between peer victimization and individual mental health disorders such as conduct disorders and depression, and explore whether peer victimization predicts perpetration of violence against peers.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

SOW, KD and KC conceptualized and designed the analysis. SOW analyzed the data, interpreted the results and drafted the manuscript. KC reviewed and edited the manuscript. All co-authors reviewed the manuscript.

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References

Abramsky, T., Devries, K., Kiss, L., Francisco, L., Nakuti, J., Musuya, T., ... Watts, C. (2012). A community mobilisation intervention to prevent violence against women and reduce HIV/AIDS risk in Kampala, Uganda (the SASA! Study): Study protocol for a cluster randomised controlled trial. *Trials, 13*. http://dx.doi.org/10.1186/1745-6215-13-96 96–96.

Azeredo, C. M., Levy, R. B., Araya, R., & Menezes, P. R. (2015). Individual and contextual factors associated with verbal bullying among Brazilian adolescents. *BMC Pediatrics, 15*.

Baldry, A. C. (2003). Bullying in schools and exposure to domestic violence. *Child Abuse and Neglect, 27*(7), 713–732.

Bowes, L., Arseneault, L., Maughan, B., Taylor, A., Caspi, A., & Moffitt, T. E. (2009). School, neighborhood, and family factors are associated with children's bullying involvement: A nationally representative longitudinal study. *Journal of the American Academy of Child & Adolescent Psychiatry, 48*(5), 545–553. http://dx.doi.org/10.1097/CHI.0b013e31819cb017.

Brier, N. (1995). Predicting antisocial behavior in youngsters displaying poor academic achievement: A review of risk factors. *Journal of Developmental & Behavioral Pediatrics, 16*(4), 271–276. http://dx.doi.org/10.1097/00004703-199508000-00010.

Brown, D. W., Riley, L., Butchart, A., & Kann, L. (2008). Bullying among youth from eight African countries and associations with adverse health behaviours. *Pediatric Health, 2*, 289–299.

Carrera Fernandez, M. V., Fernandez, M. L., Castro, Y. R., Failde Garrido, J. M., & Otero, M. C. (2013). Bullying in Spanish secondary schools: Gender-based differences. *Spanish Journal of Psychology, 16*, E21. http://dx.doi.org/10.1017/sjp.2013.37.

Child, J. C., Naker, D., Horton, J., Walakira, E. J., & Devries, K. M. (2014). Responding to abuse: Children's experiences of child protection in a central district, Uganda. *Child Abuse and Neglect, 38*(10), 1647–1658. http://dx.doi.org/10.1016/j.chiabu.2014.06.009.

Clarke, K., Patalay, P., Allen, E., Knight, L., Naker, D., & Devries, K. (2016). Patterns and predictors of violence against children in Uganda: A latent class analysis. *BMJ Open, 6*, e010443. http://dx.doi.org/10.1136/bmjopen-2015-010443.

Cluver, L., Bowes, L., & Gardner, F. (2010). Risk and protective factors for bullying and victimization among AIDS-affected and vulnerable children in South Africa. *Child Abuse and Neglect, 34*(10), 793–803.

Copeland, W. E., Wolke, D., Angold, A., & Costello, J. (2013). Adult psychiatric outcomes of bullying and being bullied by peers in childhood and adolescence. *JAMA Psychiatry, 70*(4), 419–426.

Devries, K. M., Allen, E., Child, J. C., Walakira, E., Parkes, J., Elbourne, D., ... Naker, D. (2013). The Good Schools Toolkit to prevent violence against children in Ugandan primary schools: Study protocol for a cluster randomised controlled trial. *Trials, 14*, 232. http://dx.doi.org/10.1186/1745-6215-14-232.

Devries, K. M., Knight, L., Child, J. C., Mirembe, A., Nakuti, J., Jones, R., ... Naker, D. (2015a). The Good School Toolkit for reducing physical violence from school staff to primary school students: A cluster-randomised controlled trial in Uganda. *The Lancet Global Health, 3*(7), e378–e386. http://dx.doi.org/10.1016/s2214-109x(15)00060-1.

Devries, K. M., Knight, L., Child, J. C., Mirembe, A., Nakuti, J., Jones, R., ... Naker, D. (2015b). The Good School Toolkit for reducing physical violence from school staff to primary school students: A cluster-randomised controlled trial in Uganda. *Lancet Global Health, 3*(7), e378–386. http://dx.doi.org/10.1016/s2214-109x(15)00060-1.

Devries, K. M., Child, J. C., Allen, E., Walakira, E., Parkes, J., & Naker, D. (2014). School violence, mental health, and educational performance in Uganda. *Pediatrics, 133*(1), e129–137. http://dx.doi.org/10.1542/peds.2013-2007.

Devries, K. M., Kyegombe, N., Zuurmond, M., Parkes, J., Child, J. C., Walakira, E. J., & Naker, D. (2014). Violence against primary school children with disabilities in Uganda: A cross-sectional study. *BMC Public Health, 14*(1), 1–9. http://dx.doi.org/10.1186/1471-2458-14-1017.

Due, P., Merlo, J., Harel-Fisch, Y., Damsgaard, M. T., Holstein, B. E., Hetland, J., ... Lynch, J. (2009). Socioeconomic inequality in exposure to bullying during adolescence: A comparative, cross-sectional, multilevel study in 35 countries. *American Journal of Public Health, 99*(5), 907–914.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., ... Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine, 14*(4), 245–258.

Fergusson, D. M., & Lynskey, M. T. (1997). Physical punishment/maltreatment during childhood and adjustment in young adulthood. *Child Abuse & Neglect, 21*(7), 617–630. http://dx.doi.org/10.1016/S0145-2134(97)00021-5.

Fleming, L. C., & Jacobsen, K. H. (2010). Bullying among middle-school students in low and middle income countries. *Health Promotion International, 25*(1), 73–84. http://dx.doi.org/10.1093/heapro/dap046.

Garcia-Moreno, C. J., Ellsberg, H., Heise, M., & Watts, L. C. (2005). *WHO multi-country study on women's health and domestic violence against women.* Geneva, Switzerland: World Health Organization.

Glaser, D. (2002). Emotional abuse and neglect (psychological maltreatment): A conceptual framework. *Child Abuse & Neglect*, *26*(6–7), 697–714. http://dx.doi.org/10.1016/S0145-2134(02)00342-3.

Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2000). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry*, *177*, 534–539.

Hillis, S., Mercy, J. A., Amobi, A., & Kress, H. (2016). Global prevalence of past-year violence against children: A systematic review and minimum estimates. *Pediatrics*, *137*(3), e20154079.

Kim, Y. S., Koh, Y. J., & Leventhal, B. (2005). School bullying and suicidal risk in Korean middle school students. *Pediatrics*, *115*(2), 357–363. http://dx.doi.org/10.1542/peds.2004-0902.

Kubwalo, H. W., Muula, A. S., Siziya, S., Pasupulati, S., & Rudatsikira, E. (2013). Prevalence and correlates of being bullied among in-school adolescents in Malawi: Results from the 2009 Global School-Based Health Survey. *Malawi Medical Journal*, *25*(1), 12–14.

Lim, S., Vos, T., Flaxman, A. D., Danaei, G., Shibuya, K., Adair-Rohani, H., ... Barker-Collo, S. (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010. *The Lancet, 380*, 2224–2260.

Mazur, J., & Malkowska, A. (2003). Bullies and victims among polish school-aged children. *Medycyna Wieku Rozwojowego, 7*(1 Pt. 2), 121–134.

MoGLSD, UNICEF and ODI (2015). Child poverty and deprivation in Uganda: Voices of children. Kampala, Uganda, Ministry of Gender, Labour and Social Development, UNICEF Uganda, Overseas Development Institute.

U.S. Department of Education, National Center for Education Statistics and National Forum on Education Statistics (2002). Safety in numbers: Collecting and using crime, violence, and discipline incident data to make a difference in schools, NCES 2002-312. Washington, DC, National Center for Education Statistics, Office of Educational Research and Improvement, U.S. Department of Education.

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLoS Medicine, 9*(11), e1001349. http://dx.doi.org/10.1371/journal.pmed.1001349.

Norton, R., & Kobusingye, O. (2013). Injuries? *New England Journal of Medicine, 368*(18), 1723–1730.

Reiter, S., Bryen, D. N., & Shachar, I. (2007). Adolescents with intellectual disabilities as victims of abuse. *Journal of Intellectual Disabilities*, *11*(4), 371–387. http://dx.doi.org/10.1177/1744629507084602.

Shields, A., & Cicchetti, D. (2001). Parental maltreatment and emotion dysregulation as risk factors for bullying and victimization in middle childhood. *Journal of Clinical Child Psychology, 30*, 349–363.

Silva, M., Pereira, B., Mendonça, D., Nunes, B., & de Oliveira, W. A. (2013). The involvement of girls and boys with bullying: An analysis of gender differences. *International Journal of Environmental Research and Public Health, 10*(12), 6820–6831.

Siziya, S., Muula, A. S., & Rudatsikira, E. (2007). Prevalence and correlates of truancy among adolescents in Swaziland: Findings from the Global School-Based Health Survey. *Child and Adolescent Psychiatry and Mental Health, 1*, 15.

Siziya, S., Rudatsikira, E., & Muula, A. S. (2012). Victimization from bullying among school-attending adolescents in grades 7–10 in Zambia. *Journal of Injury and Violence Research, 4*(1), 30–35.

StataCorp (2013). College Station, Texas, USA Patent No.

Tol, W., Komproe, I. H., Susanty, D., Jordans, M., Macy, R. D., & De Jong, J. T. V. M. (2008). School-based mental health intervention for children affected by political violence in Indonesia: A cluster randomised trial. *JAMA, 300*(6), 655–662. http://dx.doi.org/10.1001/jama.300.6.655.

Turner, H. A., Finkelhor, D., & Ormrod, R. (2010). Child mental health problems as risk factors for victimization. *Child Maltreatment*, *15*(2), 132–143. http://dx.doi.org/10.1177/1077559509349450.

Turner, H. A., Vanderminden, J., Finkelhor, D., Hamby, S., & Shattuck, A. (2011). Disability and victimization in a national sample of children and youth. *Child Maltreatment*, *16*(4), 275–286. http://dx.doi.org/10.1177/1077559511427178.

van Geel, M., Vedder, P., & Tanilon, J. (2014). Relationship between peer victimization, cyberbullying, and suicide in children and adolescents: A meta-analysis. *JAMA Pediatrics, 168*(5), 435–442.

Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health*, *45*(4), 368–375.

Wolkes, D., Woods, S., Stanford, K., & Schulz, H. (2001). Bullying and victimization of primary school children in England and Germany: Prevalence and school factors. *British Journal of Psychology, 92*, 673–696.

Yang, S. J., Kim, J. M., Kim, S. W., Shin, I. S., & Yoon, J. S. (2006). Bullying and victimization behaviors in boys and girls at South Korean primary schools. *Journal of the American Academy of Child & Adolescent Psychiatry*, *45*(1), 69–77. http://dx.doi.org/10.1097/01.chi.0000186401.05465.2c.

Zolotor, A. J., Runyan, D. K., Dunne, M. P., Jain, D., Peturs, H. R., Ramirez, C., Volkova, E., Deb, S., Lidchi, V., Muhammad, T., & Isaeva, O. (2009). ISPCAN Child Abuse Screening Tool Children's Version (ICAST-C): Instrument development and multi-national pilot testing. *Child Abuse. Negl. 33*(11), 833–841.