

Supplementary File I

Additional information on study methods

METHODS

Data for this paper are from a larger study on the incidence of electronic-media harassment among in-school adolescents in Oyo state, Nigeria.

Study design

A mixed methods approach [1] utilizing an explanatory sequential design [2] was employed. This design was appropriate because we sought to explore the association between gender and electronic aggression behaviour, the contexts in which these occurred as well as differences and similarities in the experiences of male and female students.

Study setting

The study took place in Oyo state, South Western, Nigeria. Oyo state was founded in 1976 and has a population of about 4.5 million people. The capital, Ibadan is one of the largest cities in Sub-Saharan Africa [3].

Participants

Quantitative

Our participants were in-school adolescents in selected secondary schools in rural and urban areas of Oyo state, Nigeria. Eligible students were those who owned a cellphone and had been using this for a minimum of six months prior to the study (students were also asked if they had access to the internet although this was not used as an inclusion criteria because we were also interested in capturing electronic aggression perpetrated by phone calls and Short Message Service (SMS).

Approximately 1200 students i.e. a little more than 50% of all (2013) students in the selected classes were eligible to participate although this ranged from less than 10% to 100% depending on

the school-type (government-owned or private) and class (junior or senior). A total of 653 students comprising 318 (48.7%) male and 335 (51.3%) female students with an overall mean age of 14.2 (± 2.2) years were selected and interviewed.

Qualitative

The qualitative participants comprised 18 (nine male and nine female) in-school adolescents who reported that they had been victims and/ or perpetrators of electronic aggression within three months of the study and who were willing to participate in the in-depth interviews (IDIs). The in-depth interviewees were aged 15 to 20 years.

Sample Size estimation

Quantitative

The sample size formula for cross-sectional studies, $n = [P (100-P)] / (SE)^2$ was used (30) to determine the minimum sample size required for the study. For P, the prevalence of electronic aggression among secondary school students, we utilized a value of 33.9% reported in a pilot study conducted by Sangowawa and Adebisi, 2010¹¹. The Standard error (SE) was determined by dividing the confidence interval, 5 by the standard normal deviate (30) corresponding to an α of 0.05 = 1.96; this gave a value of approximately 345. The calculated minimum sample size was multiplied by 1.5 to adjust for a clustering effect [4] and a minimum sample size of 518 was obtained. (This has been similarly described in a previous publication [5]. A total of 653 eligible students (318 males and 335 females) gave consent/assent and were interviewed

Qualitative

We planned to interview 16 - 20 students as we anticipated that with this number we would attain saturation. Twenty-eight students were asked if they would like to participate out of which twenty-three agreed to be interviewed. Eighteen students were eventually interviewed. Five of the 23 students were unable to participate although they initially agreed to do this. This was because the dates scheduled for the in-depth interviews clashed with preparation for their end-of-term examinations and they were unable to make out time for the interviews.

Sampling technique

Quantitative

A multi-stage sampling technique was used to select the 653 students (also described in previous publications) [6 7]. Oyo state comprises six health zones (Ibadan, Ibarapa, Oyo, Upper Oke Ogun, Lower Oke Ogun and Ogbomoso health zones) [8]. In stage I, two (Ibarapa and Ibadan) of the six health zones were selected by simple random sampling. Stage II involved initial stratification of the 14 Local Government Areas (LGA) within the selected health zones into rural/ peri-urban (nine) and urban (five) LGA. One rural/ peri-urban and one urban LGA were then selected from each stratum by balloting. In stage III, list of all registered private and government-owned secondary schools in each of the selected LGA was compiled. There were seven private and 16 government-owned secondary schools in the rural area and 32 private and 86 government-owned secondary schools in the urban area. Five schools (three private and two-government-owned) were selected from the urban area and four (two private and two government-owned schools) from the rural LGA by stratified random sampling (the schools were initially stratified into private and government-owned schools). In the fourth stage, which involved selection of classes, an arm of

each class (Junior Secondary class one to Senior Secondary class three¹) was selected. In schools where there were less than 12 - 14 students who owned phones, all eligible students in the class were interviewed. In schools where the total number of eligible students (i.e. students who owned cellphones) per class was higher than the anticipated sample of 12 to 14 students per class, respondents were selected by simple random sampling after an initial stratification by gender.

Qualitative

Twenty-three students who were willing to be part of the in-depth interviews were purposively selected. These were students who during the course of the questionnaire administration indicated that they had experienced electronic aggression as victims and/ or perpetrators more than once and across different media channels and who were willing to provide detailed information on these experiences. However, 18 (nine male and nine female) students who had been victims and/ or perpetrators of electronic aggression eventually participated.

Study instruments

Quantitative

Information was obtained from the students with the aid of a pre-tested interviewer-assisted electronic questionnaire. The questionnaire was built into an electronic data collection software (surveymonkey ©2013). Questionnaires were filled electronically using laptop computers. We designed our study instruments based on findings from a review of literature on cyberbullying

¹ In Nigeria, secondary education is divided into two three-year cycles: junior secondary education (covering junior secondary classes I, II and III) and senior secondary education (senior secondary classes I, II and III). Source: UNESCO International Bureau of Education. (2010). World Data on Education. *Principles and general objectives of education*. Retrieved from http://www.ibe.unesco.org/fileadmin/user_upload/Publications/WDE/2010/pdf-versions/Nigeria.pdf on November 6, 2015

among secondary school students. We adapted our questions from the paper on, “Cyberbullying: its nature and impact in secondary school pupils”, by Smith et al. (2008) [9].

We included a description of what constituted cyber harassment as, “a situation, in which a person or group of people did any or all the following things to another person, “said mean and/or hurtful things, made fun of, called him or her mean and hurtful names, completely ignored or excluded him or her from a group, left him or her out of things on purpose, told lies or spread false rumors about him or her, sent mean notes, tried to make other students dislike him or her and other similar hurtful things and if this was carried out through text messaging, pictures/photos or video clips, phone calls, email, chat rooms, and websites”.

Similar to Smith et al. (2008), we first asked two general questions about whether the respondent had been a victim/perpetrator of any type of bullying in the last three months. Next we asked specifically if the respondent had ever been a victim/ perpetrator of harassment via cellphone or email. Response options were: (i) Yes or (ii) No. We then asked if the respondent had heard of harassment perpetrated by various electronic media channels occurring in their school or among their circle of friends and options were: (i) Yes or (ii) No.

To assess prevalence and experiences of electronic aggression, we included an introductory statement explaining that subsequent questions referred to incidents which occurred in the three month preceding the study. Then we asked whether the respondent had been a victim of cyber harassment in school or outside of school for each of the following media channels: email, text message, phone calls, chat room conversation, websites and mobile phone pictures and/or video-clips. The responses for each media were recorded as follows: never = 0; only once = 1; only twice = 2; 2 or 3 times a month = 3; about once a week = 4; several times a week = 5. This was slightly

different from the response options described by Smith et al. (2008) as they reported the options once and twice as one response while we split them. We repeated the questions for a history of perpetration.

We obtained the following additional information on the last incident of electronic aggression experienced: (a) The media channel used - email, text message, phone calls, chat room conversation, websites and mobile phone pictures and/or video-clips; (b) The place where bullying was experienced (for victims) - the options were at home or in school; (c) The time the incident took place - during or after school; (d) The gender and (e) class of the person (bully/victim), if known. We also asked an open-ended question in which respondents were required to provide information on the type of harassment behaviour perpetrated or received. During the analysis, the investigators classified these into one of the following: the use of mean/ hurtful words/ making fun off the victim; use of abusive words, ignoring/excluding the victim; telling lies /spreading rumours about; making unwanted relationship or sexual advances; threatening the victim; sharing secrets or embarrassing information about the victim; sexting. These categories were based on a modification of the forms of harassment/ cyberbullying described by Willard [10] and Mishna et. al. (2010) [11]. Respondents who perpetrated electronic aggression were asked if they went on to confront their victim after the incident of electronic aggression. We also enquired about the effect of the last incident on the respondent (as a perpetrator or victim). In addition, we enquired (from the victims) information on (i) the immediate actions taken; (ii) whether the victim reported the incident to anyone; (iii) the person reported to and (iv) the reason for choosing to report to this person (Additional details on questions asked are in Appendix II).

The questionnaire was pretested among students in a school which was not one of the selected schools within one of the LGAs. Information obtained from the pre-test was reviewed and ambiguous questions re-phrased.

After collecting data for the main study, we ran internal consistency tests on questions assessing victimization and perpetration of electronic aggression and obtained Cronbach's alpha of 0.65 for the victimization questions and 0.69 for the perpetration questions.

Qualitative

An in-depth interview guide was used to explore issues surrounding a history of cyberbully perpetration or victimization within three-months of the study. Information obtained included circumstances preceding the incident, the type of electronic aggression behaviour, the effect of the incident on the victim and on the perpetrator, response of the victim to the incidents and the outcome if the incident was reported.

All instruments were translated and back-translated into Yoruba, the predominant language in the study area and research staff had copies of these for students who requested that they preferred to be interviewed in Yoruba although the language of instruction in secondary schools is English. This was based on the researchers' previous experience working with adolescents in the study area where some respondents had preferred to be interviewed in the predominant local language, Yoruba. Overall, approximately 30 students preferred to be interviewed using the Yoruba version of the instrument and these students were mainly in the rural local government.

Data collection procedure

Ethical Issues

Ethical approval for the study was obtained from the University of Ibadan/ University College Hospital, Ibadan, Ethical Review Board. Permission was also obtained from the State Ministry of Education and the Local Inspectorate of Education. The principals of each of the schools provided consent for the investigators to interview each student after going through a paper version of the questionnaire. Students who were 18 years or older also provided informed consent while those younger than 18 years provided assent. All respondents were assured that their responses would be kept confidential.

Quantitative

The schools were identified from the list of schools obtained from the State Secondary Education Board and the Local Inspectorate of Education. The investigators have experience conducting research in the study area and this facilitated the process of locating the schools and engaging with the school authorities. In the rural area, an adult member of the community also assisted with locating the schools. The school principals scrutinized the questionnaires and gave permission for the study to be conducted in their schools. All students were taken through the process of informed consent/ assent. The study was explained to them and they were assured that all their responses would be confidential and they were not under compulsion to participate or to complete the questions if they did not want to.

On the average, it took about 15 to 25 minutes to fill the questionnaire (students without an experience of aggression took a shorter time) and questionnaires were administered during the students break or other free period specified by the school authorities. The school authorities provided a quiet room within the school premises used for administration of the instrument. Each

student was assisted by a research staff who had been trained and had experience conducting surveys on sensitive issues with adolescents. Each student was assured of confidentiality and anonymity of the information provided. No names or personal identifying information were obtained. Overall, the pretest and data collection lasted about four months.

Qualitative

Following the administration of the questionnaire, students who reported that they had been victims and/ or perpetrators of electronic aggression were asked if they would be willing to participate in the in-depth interviews and specific times convenient for the students were scheduled. Quantitative data collection was conducted over two to three days in each school and most of the in IDIs were conducted during this period. Some IDIs were conducted up to a couple of weeks following questionnaire administration, depending on the time convenient for the students. The students were assured that their responses would be confidential and they would not suffer any consequences if they did not participate. All the students were interviewed in a quiet room in their schools where their privacy was assured. Two research staff (the interviewer and the note taker) conducted each IDI and the interviews were digitally recorded. Prompts and follow-up questions were utilized as appropriate. The note taker also documented non-verbal cues in addition to taking notes.

Measures

Our independent variable was gender (male or female). The dependent variables were: experience, effects and reporting of electronic aggression.

i. Experience of electronic aggression

We obtained the following information on experience of electronic aggression:

Prevalence of electronic-aggression (perpetration): This was assessed based on a self-reported history of aggression perpetrated via at least one media channel in the 3-month preceding the study. The responses for each media were as follows: never = 0; only once = 1; only twice = 2; 2 or 3 times a month = 3; about once a week = 4; several times a week = 5.

In our final analysis, we determined prevalence of perpetration of electronic-aggression by at least one of the media in the 3-month preceding the study by dichotomizing the responses to “yes” if the respondent mentioned that he/she had perpetrated aggression only once to several times and “no” if the response was never [7].

Prevalence of electronic-aggression (victimization): Similar to the prevalence of perpetration of electronic aggression, we assessed the prevalence of victimization by electronic media based on a self-reported history of aggression experienced as a victim via at least one media channel in the 3-month preceding the study. The responses for each media were: never = 0; only once = 1; only twice = 2; 2 or 3 times a month = 3; about once a week = 4; several times a week = 5. The prevalence of electronic victimization by at least one of the media in the 3-month preceding the study was obtained by dichotomizing the responses to “yes” if the respondent mentioned that he/she had been a victim of electronic aggression only once to several times and “no” if the response was never.

ii. Effects of electronic aggression on cyberbullies and cybervictims

Students who were perpetrators and victims of electronic aggression were asked if the last incident they experienced had any effect on them. Options were: (i) No effect; (ii) I felt very sad (iii) I felt

angry (iv) I started to keep to myself (v) I did not feel like going to school (vi) I felt afraid (vii) I developed headache (viii) Other, specify.

iii. Reporting of incidents of electronic aggression

Victims were asked for their immediate response following the last incident of electronic aggression. For those who stated that they reported to someone, the subsequent open-ended questions enquired about who they reported to and their reason for choosing to report to this person

Data analysis

Quantitative data

The quantitative data was exported into SPSS version 20 and analysed with the same software. The association between gender and experience, effects and reporting of electronic aggression were examined using chi-square test and the Fisher's exact p-value was reported as some of the cells had small expected counts [12]. The level of significance was $p < 0.05$.

Qualitative data

All the in-depth interviews were digitally recorded, transcribed verbatim and those conducted in the local language (Yoruba) were translated by an independent staff. The qualitative data were analysed using a constant comparative analysis approach [13 14] and the process was led by the Principal Investigator (PI). The PI read through the translated transcripts and conducted random checks for quality by comparing some of the English and Yoruba transcriptions side-by-side to ensure that they were properly translated. The translated transcripts were then uploaded onto ATLAS.ti software (Scientific Software, Berlin; version 7). The PI and two research staff experienced in qualitative data collection and analysis read through the transcripts as they were available and they developed an initial list of codes. The two research staff independently coded

the transcripts and when there were controversies, the PI and coders discussed the issues and came to an agreement regarding the codes. Additional sub-codes were developed during the process of coding when necessary and these were discussed and agreed upon by all coders before they were used. Other research staff were also involved in this process and provided clarification where necessary. The qualitative findings were presented to team members who participated in the coding as well as to colleagues with experience in mixed methods research and research among adolescents and they provided feedback. Additional context-specific clarifications were provided as required. Coding ended when codes were assigned to all phrases and saturation was achieved [15]. After all segments of the transcripts were coded, the codes were grouped into broader similar categories. We then developed themes that described the content of each of the broader categories. This process was guided by information from existing literature around each of the study objectives. For each of the themes, we then conducted a cross-case analysis (by gender) to explore gender differences in the students' experience, effects and reporting of electronic aggression.

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