Examining the role of bullying victimisation in predicting psychopathology among in-school Nigerian adolescents

Abstract

Purpose: This paper reports on a cross-sectional study undertaken to examine the role of bullying victimisation in predicting psychopathology, encompassing post-traumatic stress disorder (PTSD), risk of developing prodromal psychosis, and emotional and behavioural problems, among in-school Nigerian adolescents.

Methodology: Three hundred and fifty-one junior secondary students (n = 173 males, 178 females; age range: 9-17 years) were recruited from five randomly selected public secondary schools in Nigeria. Students completed a variety of self-report measures, including a socio-demographic questionnaire, the Prodromal Questionnaire – brief version, the Strengths and Difficulties Questionnaire (SDQ), and the Multidimensional Peer Victimisation Scale. They were also interviewed using the PTSD module of the Mini International Neuropsychiatric Interview-Kid Version.

Findings: Although bullying victimisation was not found to predict the presence of PTSD, it predicted the risk of developing prodromal psychosis. All SDQ subscales also held significant positive associations with bullying victimisation. This indicates that higher levels of victimisation are associated with increased behavioural and emotional difficulties among adolescents.

Value: The study contributes to the evidence demonstrating a need for improved understanding regarding the role of exposure to bullying victimisation in predicting various forms of psychopathology. Furthermore, there is specifically a need for research with this focus in developing countries in sub-Saharan Africa and the Nigerian education system.

Keywords: Bullying victimisation; Psychopathology; Post-traumatic stress disorder, Prodromal psychosis; Adolescence; Nigeria

Introduction

Bullying victimisation is recognised as a widespread, complex social and public health issue, particularly in formal educational settings (Adeosun *et al*., 2015; Elgar *et al*., 2015; Hymel and Swearer, 2015). Bullying can be direct, manifesting through open attacks on the victim, or indirect, through social isolation and exclusion from a group (Wolke and Lereya, 2015), as well as in various forms of cybervictimisation (Zhu *et al*., 2021). In school settings, bullying can manifest for a variety of reasons. For instance, the extent to which bullying behaviours are considered aberrant by students may vary, bullying may not always be viewed as a serious problem by education professionals, and it may be perceived as normative childhood behaviour by members of the wider community (Carmona-Rojas *et al*., 2023).

Despite challenges in defining the constitution of bullying behaviour and these difficulties associated with varying perceptions on the matter, there is a growing evidence base on bullying in childhood. Bullying typically involves a power imbalance (i.e., it occurs between a victimiser and victim), involves a negative intent to hurt another person on the part of the bully, and the repetition of aggressive acts (Salmivalli, 2010). Children and young people engaging in bullying and vulnerability to bullying victimisation are influenced by a range of interlinked individual, familial and environmental factors. For example, children and young people who present with a low self-concept are more likely to be victimised by peers, and more often described as being smaller in stature, physically weaker or associated with a socially marginalised group (Celik et al., 2023; Craig and Pepler, 2007; Mullan *et al*., 2023). Social skills deficits, delays in speech and impulsive or anxious behaviours have also been observed

among victims (Heinrichs, 2003), particularly those with existing mental health problems (Hart and O'Reilly, 2022).

Indeed, mental health in this population group has created worldwide concern. The pervasive nature of bullying victimisation experience among school-going children and young people has, in recent years, coincided with findings of increasing rates of adolescent psychopathology and psychosocial problems globally (Moore *et al*., 2017). Bullying victimization engenders hypervigilant states, (i.e., a fear of being attacked or persecuted), which can have an impact on other areas of children and young people's lives, such as difficulty concentrating in their studies, which, in turn, can result in poor academic performance and social integration (Laith and Vaillancourt, 2022; Yu and Zhao, 2021). Victims of bullying also show high levels of insecurity, experience loneliness, and display other forms of physical and mental ill health (Adeosun *et al*., 2015). Dropout rates and school absenteeism are also higher among victims compared to their non-bullied peers (Laith and Vaillancourt, 2022; Yu and Zhao, 2021). In the long term, if victimization persists, children and young people who are bullied are more likely to develop severe psycho-social maladjustment and emotional problems which may persist into adulthood (Balluerka *et al*., 2023).

Existing evidence suggests that bullying victimization is a risk factor for mental health problems, including anxiety and depression, as well as low self-esteem in childhood and adolescence (Balluerka *et al*., 2023). A positive association between bullying victimization and suicidality has been reported among young people from 41 low-and-middle income countries (Okobi *et al*., 2023) and a meta-analysis on longitudinal studies found a significant prospective pathway from peer victimization to suicidal ideation (van Geel *et al*., 2022). Moreover, the traumatic impact of bullying victimization has been consistently associated with post-traumatic stress disorder (PTSD) (Li *et al*., 2023; Nielsen *et al*., 2015; Ossa *et al*., 2019). Li *et al*. (2023) found that this association was through the detrimental effects of social anxiety, loneliness, and

rumination, while Idose *et al*. (2012) noted stronger association with increased frequency of victimization. Similarly, exposure to childhood trauma, including the experience of bullying victimization, has been shown to contribute to the later development of psychosis and psychosis-like experiences (Kelleher *et al*., 2013; Okewole *et al*., 2015b), an observation that is further supported by findings from several meta-analyses and review of studies (Cunningham *et al*., 2016; Kraan *et al*., 2015). Although findings from the North American Prodrome Longitudinal Study indicate that bullying victimization is a crucial risk factor for the development of this prodromal state, it was not associated with a transition to psychosis (Braun *et al*., 2022). Further investigation is therefore needed into mechanisms that connect victimization experiences to the early signs of psychosis, and other psychopathologies (Awhangansi *et al*., 2023).

While there is strong evidence for a direct link between exposure to bullying victimisation and the development of behavioural and emotional problems (Eastman *et al*., 2018; Geoffroy *et al*., 2016; Mohesny *et al*., 2019; Moore *et al*., 2017), some studies have indicated that the direction of causality between bullying victimisation and poor mental health outcomes remains indeterminate. For instance, in Le *et al*.'s study (2019), which examined reciprocal associations between bullying victimisation and mental health problems among young people, bullying victimization was found to be an independent predictor of subsequent mental health problems. Mental health problems were also observed to predict students becoming victimised. Notably, therefore, the relationship between mental health and bullying is likely bidirectional and complex and evidence on the matter is mixed. For example, in a recent systematic review and meta-analysis, preliminary findings demonstrated this bidirectional relationship between peer victimisation and internalizing problems in school-aged children, though effect sizes were small (Christina *et al*., 2021). However, the specific

mechanisms of any association were not yet clear, and understandings of the complex and systemic factors which figure in any causal link pathways warrant further exploration.

Clearly there is a need for better understanding of the role of bullying victimisation in predicting various forms of psychopathology, encompassing PTSD, risk of developing prodromal psychosis and other internalizing and externalizing problems, and it is this complexity which is addressed in this paper. Specifically, this study helps to address a need for research with this focus in majority world countries, including in sub-Saharan Africa and the Nigerian education system (Fenny *et al*., 2020; Raji *et al*., 2021) where there is typically less evidence on such matters. The study examined the role of bullying victimisation in predicting psychopathology among in-school Nigerian adolescents. The following predictions were proposed:

1. Bullying victimisation will positively associate with psychopathology among in-school Nigerian adolescents.

2. Higher levels of bullying victimization will predict increased behavioural and emotional difficulties among in-school Nigerian adolescents.

Method

Participants

Four hundred and eleven junior students from five randomly selected secondary schools in Ogun state, southwestern Nigeria were invited to participate in the study. Three hundred and fifty-one students obtained parental consent and engaged in the study (response rate = 85.4%). Of the 351 students sampled, 173 were male and 178 were female. The mean age for the overall sample was 12.5 years (SD = 1.50; age range, 9 to 17 years). For males, the mean age was 12.5 years (SD = 1.54), and for females this was 12.4 years (SD = 1.47). In terms of family characteristics, 22.8% (n = 80) of the sample indicated that their parents had separated, and

31.3% (n = 110) reported to be from a polygamous family. Most of the sample reported being from a monogamous home (68.7%; n = 241) and to be residing with two parents (77.2%; n = 271). Six percent of the sample (6%; n = 21) reported they were only children.

Materials

The following measures were utilised:

Multidimensional peer victimisation scale (MPVS; Mynard and Joseph, 2000): This 16-item self-report measure captures peer victimisation across four domains: physical victimisation (e.g., "punched me"); verbal victimisation (e.g., "called me names"); social manipulation (e.g., "tried to get me into trouble with my friends"), and attacks on property (e.g., "tried to break something of mine"). Respondents respond to each item using a three-point Likert scale ranging from "Not at all" (0) to "More than once" (2). The MPVS has been found to yield an acceptable level of internal consistency among Nigerian students (n = 240), with Cronbach's Alpha values ranging from .73 to .85 (Balogun and Olapegba, 2007).

Prodromal questionnaire – Brief version (PQB; Loewy and Cannon, 2010): This 21-item screening questionnaire was designed to detect risk of developing psychosis, rather than to diagnose a psychosis prodrome. Each item (e.g., "Do familiar surroundings sometimes seem strange, confusing, threatening, or unreal to you?") is rated as either "yes" (1) or "no" (0) depending on its relevance to the respondent. Respondents endorsing six or more symptoms are identified as being at an increased risk of developing prodromal psychosis. This questionnaire also allows for an overall distress score to be determined, with higher scores conveying the extent to which symptoms "frightened, concerned, or caused a problem" (Loewy and Cannon, 2010), but it was not utilised in this study. Okewole *et al*. (2015a) found the PQB to evidence good levels of internal consistency among Nigerian students. This is supported by

further research, which reported a Cronbach's Alpha value of .84 among the same population (Okewole *et al*., 2015b).

Strengths and difficulties questionnaire (SDQ; Goodman, 1997; Goodman and Goodman, 2009): This 25-item screening questionnaire assesses emotional and behavioural difficulties among children. The questionnaire attends to five domains, which are as follows: emotional problems (e.g., "I worry a lot…"); conduct problems (e.g., "I get very angry"); hyperactivity (e.g., "I am restless…"); peer problems (e.g., "I am usually on my own"); and prosocial behaviour (e.g., "I try to be nice to other people"). Items are rated on a three-point Likert scale ranging from "not true" (0) to "certainly true" (2). The conduct and hyperactivity scales are combined to determine an "externalising" score. Emotional and peer problems scales are also merged to compute an "internalising" score. The child self-report questionnaire was used for this study. The SDQ has previously been utilised in Nigeria and demonstrated an acceptable level of internal consistency ($\alpha = .63$; Bakare *et al*., 2010).

The Mini International Neuropsychiatric Interview-Kid Version (MINI-KID) PTSD module (Sheehan *et al*., 2010): The MINI-KID is a brief structured diagnostic interview for DSM-IV and ICD-10 disorders which was used in this study to screen for the presence of post-traumatic stress disorder. The MINI-KID diagnostic interview is well established and has been successfully administered to children and adolescents in Nigeria (Adewuya *et al*., 2020; Olashore *et al*., 2017).

Procedure

The study was conducted in Abeokuta, Ogun state, South-West Nigeria. Five schools were randomly selected for the study through a "blind draw method". Participants comprised all Junior Secondary School students (i.e., years one to three of high school) enrolled in the five selected schools. A systematic random sampling method with probability proportional to size

for each school was employed to obtain a representative sample of 411 students, of which 351 participated. All junior students in the five schools constituted the sampling frame and the total sample population was 11,633. Enrolment figures for each school were used to determine the number of students an individual school would contribute using the following formula:

$$\frac{School\ population}{Total\ sample\ population} \times Study\ sample\ size$$

After having determined the number of participants required from each school, one class was randomly selected from each level of JS1 (Year 1), JS2 (Year 2) and JS3 (Year 3) in all five schools. The alphabetically ordered nominal registers of all three selected classes in a school were combined for a sub-sampling frame. All the names in the sub-sampling frame were then numbered serially beginning with 001 for the first name. A *k*-interval specific for each school was determined using the following formula:

$$k = \frac{Total\ population\ size\ of\ selected\ classes}{School\ sample\ size}$$

< Table I to go about here >

The first participant in each school was randomly chosen using a table of random digits and thereafter subsequent participants were chosen using the school-specific *k*-interval. If a selected student was not in school on that particular day, the name was skipped and the next one chosen instead. This continued until all 411 participants were selected to be approached for participation.

Selected students were given an informed consent letter to take home to parents/guardians. This provided sufficient information for them to decide whether or not they would like their child to take part in the study. Each letter included a code number which was

maintained on all instruments used for the participant. Students who returned signed consent letters and indicated a wish to participate also gave their own assent, before being asked to complete the self-report measures. Thereafter, each student was interviewed with the PTSD module of the MINI-KID to ascertain whether there were any features of PTSD within the participant's current presentation.

Data analysis

Data was analysed using Statistical Package for the Social Sciences version 28. Analyses examined whether bullying victimisation could predict psychopathology among in-school adolescents. A series of regression analyses were conducted to explore this association, with the approach selected based on what was suitable for the characteristics of the dataset (i.e., whether it be continuous or categorical data). Correlational analyses were performed to check for multicollinearity and determine relationships among continuous data. Gender differences in bullying victimisation and psychopathology were examined using tests of difference and chi-square.

Ethical considerations

Institutional ethical approval was obtained for the study from the Human Research Ethical Committee of the Neuropsychiatric Hospital, Aro, Abeokuta, Nigeria. Permission for the study was also obtained from the Ogun State Ministry of Education as well as from the authorities of the selected schools. Respondents who met the MINI KID PTSD criteria or who were observed to have clinically significant psychological difficulty or distress were briefly counselled and offered advice as to how and where to obtain appropriate help. With their consent, school counsellors were also duly notified to offer immediate support.

Results

Twenty-five of the students met the clinical threshold for PTSD (7.1%; n = 25). Two hundred and fifty-eight students (73.5%) reported symptoms identifying them as being "at risk" of developing prodromal psychosis (i.e., by achieving a score of at least six on the PQB). Regarding sex differences, chi square tests for independence (with Yates Continuity Correction) indicated no significant association between gender and the presence of PTSD [x^2 (1, n = 351) = .00, p> .05], or risk of developing prodromal psychosis [x^2 (1, n = 351) = .32, p> .05]. Further, independent samples t-tests revealed no significant gender differences for emotional problems, conduct problems, hyperactivity, peer problems, prosocial behaviour, and overall externalising difficulties as defined by the SDQ [in all cases, t(349) ≥.47, p> .05]. Females, however, exhibited statistically significant higher levels of internalising difficulties than their male counterparts [t(349) = -1.75, p<.05]. Males reported statistically significant higher levels of physical victimisation than females [t(349) = 1.81, p< .05]. No gender differences were identified for the remaining bullying victimisation subscales or the MPVS measure overall [in all cases, t(349) = ≥.13, p> .05]. Descriptive statistics are presented in Table II.

< Table II to go about here >

Two logistic regression analyses were performed to determine the impact of bullying victimisation on the presence of PTSD and risk of developing prodromal psychosis. Both models contained the four bullying victimisation subscales (i.e., physical victimisation, verbal victimisation, social manipulation, and attack on property). When examining prodromal psychosis, PTSD presence was also included as a predictor given its proposed clinical relationship with prodromal psychosis (Buswell *et al*., 2021). The model exploring the impact of victimisation on the presence of PTSD was found to be non-significant [x^2 (4, n = 351) =

2.44, p> .05], thus indicating that it was unable to distinguish between adolescents who met criteria for PTSD from those that did not. Although the model attending to the risk of developing prodromal psychosis was found to be significant [x^2 (5, n = 351) = 18.26, p< .05], none of the victimisation subscales or the presence of PTSD made a unique statistically significant contribution [in all cases, Wald ≥ .00, p> .05]. This model only explained between 5% (Cox and Snell R^2) and 7% (Nagelkerke R^2) of the total variance.

Prior to the standard multiple regression analyses being considered, bivariate correlations were completed across those measures that engendered continuous forms of data (i.e., the MPVS and SDQ). Correlation coefficients for these analyses are displayed in Table III.

< Table III to go about here >

All SDQ subscales held significant positive associations with bullying victimisation, thus suggesting that higher levels of victimisation are associated with increased behavioural and emotional difficulties. Prosocial behaviour, as assessed via the SDQ, did not significantly correlate with any of the bullying victimisation subscales, or overall. There was no evidence of multicollinearity among the variables.

A series of standard multiple regression analyses adopting the 'enter' method were conducted to establish the amount of variance in SDQ-defined behavioural and emotional difficulties that could be explained by bullying victimisation. The coefficients for these analyses are presented below in Table IV. Externalising [F(4, 346) = 9.09, p< .001] and internalising [F(4, 346) = 8.44, p< .001] difficulties evidenced statistically significant regression models, with 10% (R^2 = .10) and 9% (R^2 = .09) of the total variance explained, respectively. In both cases, verbal victimisation manifested as a significant predictor (ext: β =

.20, p< .01; int: β = .17, p< .05) positively associating with increased levels of externalising and internalising difficulties. The remaining predictors failed to reach statistical significance.

< Table IV to go about here >

In relation to conduct problems [F(4, 346) = 7.27, p< .001], hyperactivity [F(4, 346) = 5.77, p< .001], and peer problems [F(4, 346) = 5.90, p< .001], the overall regression models were significant, with 8% (R^2 = .08), 6% (R^2 = .06) and 6% (R^2 = .06) of the total variance explained, respectively. In all three models, verbal victimisation featured as the only significant predictor (cp: β = .18, p< .05; h: β = .17, p< .05; pp: β = .19, p< .05), with it positively associating with the three SDQ subscales. Emotional problems (F(4, 346) = 5.31, p< .001) also exhibited a significant overall regression model. In this instance, 6% (R^2 = .06) of the total variance was explained with social manipulation (β = .15, p< .05) featuring as the sole significant predictor. Thus, increased levels of social manipulation were associated with higher levels of emotional problems. The overall regression model for prosocial behaviour did not reach statistical significance [F(4, 346) = .18, p> .05].

Discussion

The study findings expand on the current evidence in terms of what is known about the role of bullying victimisation in predicting psychopathology, specifically PTSD, prodromal psychosis, and emotional and behavioural problems, with a focus on in-school Nigerian adolescents. The work adds to available literature on this subject and can serve as a reference for mental health professionals in sub-Saharan Africa working with children and young people in clinical settings, as well as other stakeholders in educational contexts and policy development. The study will also be of interest to mental health researchers concerned with bullying victimisation more generally.

Gender and psychopathology

Although there is substantial evidence suggesting an increased likelihood of females developing PTSD compared to males (Astitene and Barkat, 2021; Garza and Jovanovic, 2017; Ramike and Ressler, 2018), this study did not find any significant association between gender and PTSD among the participating students. The explanations for any gender difference in PTSD risk are currently thought to be complex, involving an interplay between a range of factors – physiological, psychological and social (see, e.g., Ramike and Ressler, 2018). As observed in the Avon Longitudinal Study of Parents and Children cohort study conducted in the UK, gender differences in PTSD risk were absent in childhood but gradually emerged from adolescence, at around age 13 (Haag *et al*., 2020). It is possible that any gender difference in the current study population may have developed over time at a higher age cut-off and may relate to social and cultural influences. Comparable longitudinal studies in Nigeria will be required to establish such gender-related difference in PTSD risk or provide further explanations for the unique finding of this study.

Furthermore, the current study did not find any significant association between gender and development of prodromal psychosis. This finding is largely consistent with existing studies where the role of gender as a predictive variable for prodromal psychosis has generated mixed results (Barajas *et al*., 2015). Important, however, is the report that there are significant gender differences in the clinical manifestation, progression, and outcome for those who develop psychosis prodrome (Giordano *et al*., 2021). Any identified gender disparity thus may be linked to differences in neuroendocrine and affective arousal systems (Goldstein, 2006). In line with existing literature (Ara, 2016; Docherty *et al*., 2016), the current study provided evidence that gender remains a significant predictor of internalizing and externalizing problems among school-going adolescents. A possible explanation for this finding is the suggestion that

the experience of sociocultural conceptions of masculinity and femininity differentially shape the perception of self in adolescence which contributes to the development of externalizing and internalizing symptoms (Rosenfield, 2000).

Impact of bullying victimization on psychopathology

The experience of bullying victimization in our study did not differentiate between those who met the criteria for PTSD diagnosis and those who did not. This is a contrast to what has been reported in some existing literature (Idsoe *et al*., 2021; Nielsen *et al*., 2015). For instance, in a national survey among secondary school students in Norway, peer victimization was found to be a potential risk factor for developing PTSD symptoms (Idsoe *et al*., 2012). Similarly, a significant association between school bullying victimization and PTSD symptoms was found among public secondary school students in Germany (Ossa *et al*., 2019). Among Chinese adolescents, bullying victimization had a direct and positive association with the development of PTSD (Li *et al*., 2023). From the perspective of a stress vulnerability model, it is possible that student participants in our study may have developed substantial resilience over the years from various environmental protective factors, including those related to familial relationships, that may serve to buffer the potentially traumatic impact of bullying victimization (Daniels and Brown, 2021; Demke, 2022).

Other factors, including methodological differences and sociocultural contexts, may be responsible for the variance between our findings and what these other studies reported. These other studies used screening tools to detect PTSD, while our study used a diagnostic instrument. In the study by Idose *et al*. (2012), the strength of the association was stronger with increased frequency of bullying victimization experience, but the current study did not assess the frequency and intensity of peer victimization, which may have contributed to the findings. Apart from investigating the impact of the frequency and duration of bullying victimization,

Ossa *et al*. (2019) used a definition of "severe, potentially traumatic situation" for bullying victimization in their study, differentiating those who were moderately bullied from those who were severely bullied. Again, in the current study, not differentiating between the extent of victimization may explain the non-significant findings. Future research in Nigeria will need to consider the extent of victimisation and other mediating variables underpinning the reported significant association between peer victimization at school and PTSD. Such research may lend new insights into positive associations between bullying victimization and PTSD through adolescent's social anxiety, loneliness, and rumination (Li *et al*., 2023). Our study did consider the impact of various forms of victimization, like physical victimization, verbal victimization, social manipulation, and attack on property, on development of PTSD, and while no significant association was found, future researchers will have a foundation for further exploration.

The logistic regression model deployed enabled an exploration of the overall impact of bullying victimization on the risk of developing prodromal psychosis and this was found to be significant, while none of the victimization subscales or the presence of PTSD made any statistically significant contribution to the development of psychosis prodrome. This is largely consistent with existing studies that have shown that being bullied at school contributes in some way to the development of psychosis. For instance, bullying victimization experience was significantly associated with a predisposition to psychosis-like experiences among the cohort of 14- to 16-year-olds who participated in Campbell and Morrison's (2007) study. Similarly, a lifetime history of bullying victimization or its occurrence in the preceding six months could appreciably predict the occurrence of psychosis prodrome (Okewole *et al*., 2015b). Early childhood trauma is linked with psychosis susceptibility (Kelleher *et al*., 2013; Kraan *et al*., 2015; Sahin *et al*., 2013). These observations are also well supported by findings from one meta-analysis and review of prospective studies (Cunningham and Shannon, 2016). In the North American Prodrome Longitudinal Study, bullying victimization was a major risk factor

for the development of the at-risk state, though it was not associated with a transition to psychosis (Braun *et al*., 2022).

Indeed, the specific mechanism linking victimization to prodromal psychosis remains unclear. It is possible that the traumatic experience of victimization sets off a stress-response and increases stress sensitivity that gradually cascades into psychosis-prodrome (Rauschenberg *et al*., 2021). It is also possible that social and problem-solving skill difficulties that emerge during the prodromal phase of psychosis make adolescents more vulnerable to bullying victimisation, and are compounded by environmental factors (Strauss *et al*., 2018). There are also suggestions that adolescents who develop psychosis-like experiences have personal and interpersonal characteristics that predispose them to peer hostility and rejection (Campbell and Morrison, 2007). Future exploration of psychosocial factors among Nigerian children and young people will provide further evidence that may support the development of intervention programs to prevent or delay the development of psychosis in these at-risk groups. Additionally, more research like that of Wong (2016), that explores the subjective experiences of victims of school bullying who later developed early psychosis may help address the gap in our understanding of any causal links between the two.

We found significant positive associations between bullying victimization and all the different subscales of the SDQ, indicating that higher levels of peer victimization are associated with increased behavioural and emotional difficulties. In fact, verbal bullying manifested as a significant predictor of both internalizing and externalizing difficulties. This gives credence to existing literature that has strongly linked bullying victimization with a wide range of adverse outcomes. For instance, in their study, Mohseny *et al*. (2019) found a positive and significant correlation between conduct, emotional, social, peer and hyperactivity problems with bullying behaviours. Similarly, to better understand the symptom profile of bully victimized adolescents, Eastman *et al*. (2018) found a strong association between students who

experienced any type of bullying victimization (direct, indirect or both) and those who fit the high internalizing and high externalizing symptom profile. Adolescents may display externalizing behaviours as an attempt to minimize the negative emotions such as anxiety and anger following victimization (Sullivan *et al*., 2006). The resulting shame from being bullied may lead to social isolation, preventing a young person from accessing opportunities to learn social skills, which could lead to antisocial behaviour and other externalizing problems (Rudolph *et al*., 2014). Externalizing behaviours like aggression among victims of peer victimization may also function as a response to the victimization they have suffered (Casper and Card, 2017). Furthermore, adolescents who have been exposed to victimization may score higher for internalizing symptoms because of hostile attributions and internalizing negative peer messages which may trigger difficulties such as low self-esteem, feelings of loneliness, anxiety, depression, and suicidal ideation (Cross *et al*., 2015; Peng *et al*., 2020).

Although not considered in the current study, other studies have demonstrated a reverse direction as well as mediating factors in the association between bullying victimization and the various internalizing and externalizing behaviours. For instance, de Sousa *et al*. (2021) found that problems with social skills play a mediating role in the positive association between internalizing problems and bullying victimization. They found that poorer assertiveness, engagement, and self-control abilities promoted anxious and depressed states which left them more vulnerable to being potential victims of bullying. While these perspectives of the directional path of bullying victimization and psychosocial problems are considered simplistic (see e.g., Busch *et al*., 2015), there is a need for more robust studies in Nigeria to not only consider further understanding of the causal links, but also to consider various mediating variables that may be involved.

Study limitations

In terms of study limitations, the cross-sectional design involved reliance on the retrospective recall of the traumatic experience of bullying victimization. As such, no direct causal inferences can be drawn from the findings. In future, longitudinal study designs that follow a cohort of bullying-victimized students in Nigeria will strengthen findings of association or non-association with psychopathology. Though significant associations were noted in our study which verifies our study predictions, we cannot attribute the observation of PTSD, prodromal psychosis, emotional and behavioural difficulties solely to the experience of bullying victimization. As the bullying victimization measure used in our study solely addressed experience within the past school year, it is possible that the vulnerability for these conditions was already present before exposure to peer victimization. Future research can therefore attempt to establish temporal relationships and the strength of any associations by characterizing and differentiating between recent and remote timepoints of victimization exposure.

It is also possible that other confounding variables not accounted for in our study could have played a mediating role in the causal links. Future research using a longitudinal approach may thus examine some of these variables to determine temporality of association. This will be useful to further understand causal mechanisms, especially from an African context, particularly for the purpose of developing preventive strategies. Also, future studies in Nigeria can consider using tools that measure not just the frequency, but the intensity and duration of bullying victimization experience. Such extensive characterization of peer victimization experience may further our understanding of causal links to psychopathology. Importantly, although the MPVS tool captures peer victimization across four domains, it is limited in not accounting for cyberbullying, as a pervasive form of bullying across home and school life for adolescents. Lastly, the use of self-report questionnaires for assessing the various forms of bullying victimization, prodromal psychosis as well as behavioural and emotional difficulties

is limiting. Other data collection methods, like individual interviews and observation, would strengthen the reliability of findings from future research.

Practice implications

- Given what is known about high prevalence of bullying victimization across educational settings, the findings of this study support a concern with the social determinants of mental health and mental health professionals developing pluralistic competencies in working with social systems (see, e.g., Gnanapragasam *et al*., 2023; Guessoum *et al*., 2022).
- Mental health professionals working with children and young people in school, clinical or other settings in Nigeria should routinely consider bullying as a risk factor in emotional, behavioural, and mental health problems.
- Schools and teachers, and other educational professionals, hold a responsibility for working to address bullying through the creation of healthy school climates. These professionals require adequate training to recognize and address bullying behaviors effectively.
- The study findings add support to whole system approaches involving relevant stakeholders in health, education, social and criminal justice sectors via protective policies based on local "buy in" from the school community (Jenkins *et al*., 2023; Twemlow *et al*., 2002).
- Linked to this, there is a need to foster dialogue between students, parents, teachers, and mental health professionals, and other stakeholders regarding addressing bullying within individual school settings, at a local level. This may help limit the risk of contact with forensic and youth criminal justice systems by addressing underlying factors that contribute to antisocial and offending behavior (Jones, 2023; Lee et al., 2021).

Conclusion

This study helps address a lack of research examining how exposure to bullying victimization by peers predicts different forms of mental health problems, particularly PTSD and prodromal psychosis, among school-going adolescents in Nigeria. Our findings that female students exhibited higher levels of internalizing difficulties than males whilst males showed more externalizing behaviours than females in the study population extend what is established in the literature. We conducted logistic regression analyses which produced some significant findings. Notably, the model exploring the impact of bullying victimization on the risk of developing prodromal psychosis was found to be significant. We also found that higher levels of victimization are associated with increased behavioural and emotional difficulties, and there was no evidence of multicollinearity among the studied variables.

A range of avenues for future enquiry were identified in discussing the study findings, and further research is needed regarding the relationship between bullying victimisation and mental ill-health amongst children and young people in Nigeria. Nevertheless, the findings support joined up working between mental health and educational professionals and the value that efforts to prevent bullying will afford in supporting vulnerable students in this context.

References

Adeosun, I. I., Adegbohun, A., Jejeloye, A., Oyekunle, O., Ogunlowo, O. and Pedro, A. (2015), "Bullying victimization among secondary school students in Lagos, Nigeria:

Emotional, behavioural and mental health correlates", *British Journal of Education, Society and Behavioural Science*, Vol. 11 No. 1, pp. 1-8.

Adewuya, A. O., Wright, K. and Njokanma, F. (2020), "Psychotic like experiences among Nigerian school adolescents: Findings from the Lagos schools emotional and behavioral health survey", *Early Intervention in Psychiatry*, Vol. 15 No. 4, pp. 906-913.

Ara, E. (2016), "Internalizing and externalizing problems in adolescents analyzing the gender difference", *International Journal of Research in Social Sciences*, Vol. 6 No. 1, pp. 328-337.

Astitene, K. and Barkat, A. (2021), "Prevalence of posttraumatic stress disorder among adolescents in school and its impact on their well-being: A cross-sectional study", *Pan African Medical Journal*, Vol. 39 No. 1, pp. e1-e11.

Awhangansi, S., Okewole, A., Archard, P. J. and O'Reilly, M. (2023), "Perspective on clinical high-risk for psychosis in Africa", *Frontiers in Psychiatry*, Vol. 14, Article no. 1226012.

Bakare, M. O., Ubochi, V. N., Ebigbo, P. O. and Orovwigho, A. O. (2010), "Problem and pro-social behaviour among Nigerian children with intellectual disability: The implication for developing policy for school based mental health programs", *Italian Journal of Pediatrics*, Vol. 36, pp. e1-e7.

Balluerka, N., Aliri, J., Goñi-Balentziaga, O. and Gorostiaga, A. (2023), "Association between bullying victimization, anxiety and depression in childhood and adolescence: The mediating effect of self-esteem", *Revista de Psicodidáctica*, Vol. 28 No. 1, pp. 26-34.

Balogun, S. K. and Olapegba, P. O. (2007), "Cultural validation of the multidimensional peer victimisation scale in Nigerian children", *Journal of Cross-Cultural Psychology*, Vol. 38 No. 5, pp. 573-580.

Barajas, A., Ochoa, S., Obiols, J. E. and Lalucat-Jo, L. (2015), "Gender differences in individuals at high-risk of psychosis: A comprehensive literature review". *The Scientific World Journal*, Art: 430735, pp. e1-e13.

Braun, A., Liu, L., Bearden, C.E., Cadenhead, K.S., Cornblatt, B.A., Keshavan, M., Mathalon, D.H., McGlashan, T.H., Perkins, D.O., Seidman, L.J. and Stone, W. (2022), "Bullying in clinical high risk for psychosis participants from the NAPLS-3 cohort", *Social Psychiatry and Psychiatric Epidemiology*, Vol. 57 No. 7, pp. 1379-1388.

Busch, V., Laninga-Wijnen, L., van Yperen, T. A., Schrijvers, A. J. P. and De Leeuw, J. R. J. (2015), "Bidirectional longitudinal associations of perpetration and victimization of peer bullying with psychosocial problems in adolescents: A cross-lagged panel study", *School Psychology International*, Vol. 36 No. 5, pp. 532-549.

Buswell, G., Haime, Z., Lloyd-Evans, B. and Billings, J. (2021), "A systematic review of PTSD to the experience of psychosis: Prevalence and associated factors", *BMC Psychiatry*, Vol. 21, pp. e1-e13.

Campbell, M. L. and Morrison, A. P. (2007), "The relationship between bullying, psychotic-like experiences and appraisals in 14–16-year olds", *Behaviour Research and Therapy*, Vol. 45 No. 7, pp. 1579-1591.

Carmona-Rojas, M., Ortega-Ruiz, R., Romera, E. and Bravo, A. (2023), "Aggressive and defensive behaviour, normative, and social adjustment in the complex dynamics of school bullying", *Psychosocial Intervention*, Vol. 32 No. 3, pp. 165-175.

Casper, D. M. and Card, N. A. (2017), "Overt and relational victimization: A meta-analytic review of their overlap and associations with social–psychological adjustment", *Child Development*, Vol. 88 No. 2, pp. 466-483.

Celik, H., Hopkins, L., and O'Reilly, M**.** (2023), "Exploring the perspectives of Turkish adolescents on bullying: A qualitative study", *Psychology in the Schools*, Vol. 60 No. 8, pp. 2729-2743.

Christina, S., Magson, N. R., Kakar, V. and Rapee, R. M. (2021), "The bidirectional relationships between peer victimization and internalizing problems in school-aged children: An updated systematic review and meta-analysis", *Clinical Psychology Review*, Vol. 85, Article no. 101979.

Craig, W. M. and Pepler, D. J. (2007), "Understanding bullying: From research to practice", *Canadian Psychology/Psychologie Canadienne*, Vol. 48 No. 2, pp. 86-93.

Cross, D., Lester, L. and Barnes, A. (2015), "A longitudinal study of the social and emotional predictors and consequences of cyber and traditional bullying victimisation", *International Journal of Public Health*, Vol. 60, pp. 207-217.

Cunningham, T., Hoy, K. and Shannon, C. (2016), "Does childhood bullying lead to the development of psychotic symptoms? A meta-analysis and review of prospective studies", *Psychosis*, Vol. 8 No. 1, pp. 48-59.

Daniels, A. D., & Bryan, J. (2021). "Resilience despite complex trauma: Family environment and family cohesion as protective factors", *The Family Journal*, *29*(3), 336-345.

de Sousa, M. L., Peixoto, M. M and Cruz, S. F. (2021), "The association between externalizing and internalizing problems with bullying engagement in adolescents: The mediating

role of social skills", *International Journal of Environmental Research and Public Health*, Vol. 18, Article no. 10444.

Demke, E. (2022), "The vulnerability-stress-model - holding up the construct of the faulty individual in the light of challenges to the medical model of mental distress", *Frontiers in Sociology*, Vol. 7, Article no. 833987.

Docherty, M., Boxer, P., Veysey, B. M. and Ostermann, M. (2016), "Gender differences in prevalence of internalizing and externalizing symptoms in a justice-referred sample of youth", *Journal of Juvenile Justice*, Vol. 5 No. 2, pp. 104-120.

Eastman, M., Foshee, V., Ennett, S., Sotres-Alvarez, D., Reyes, H. L. M., Faris, R. and North, K. (2018), "Profiles of internalizing and externalizing symptoms associated with bullying victimization", *Journal of Adolescence*, Vol. *65*, pp. 101-110.

Elgar, F.J., McKinnon, B., Walsh, S.D., Freeman, J., Donnelly, P.D., de Matos, M.G., Gariepy, G., Aleman-Diaz, A.Y., Pickett, W., Molcho, M. and Currie, C., (2015), "Structural determinants of youth bullying and fighting in 79 countries", *Journal of Adolescent Health*, Vol. 57 No. 6, pp. 643-650.

Fenny, O. and Falola, M. I. (2020), "Prevalence and correlates of bullying behaviour among Nigerian middle school students", *International Journal of Offender Therapy and Comparative Criminology*, Vol. 64 No. 5, pp. 564-585.

Garza, K. and Jovanovic, T. (2017), "Impact of gender on child and adolescent PTSD", *Current Psychiatry Reports*, Vol. 19, Article No. 87, pp. 1-6.

Geoffroy, M. C., Boivin, M., Arseneault, L., Turecki, G., Vitaro, F., Brendgen, M., Renaud, J., Séguin, J. R., Tremblay, R. E. and Côté, S. M. (2016), "Associations between peer victimization and suicidal ideation and suicide attempt during adolescence: Results

from a prospective population-based birth cohort", *Journal of the American Academy of Child and Adolescent Psychiatry*, Vol. 55 No. 2, pp. 99-105.

Giordano, G. M., Bucci, P., Mucci, A., Pezzella, P. and Galderisi, S. (2021), "Gender differences in clinical and psychosocial features among persons with schizophrenia: A mini review", *Frontiers in Psychiatry*, Vol. 12, Article no. 789179.

Gnanapragasam, S.N., Wright, L.A., Pemberton, M. and Bhugra, D., (2023), Outside/inside: social determinants of mental health. *Irish Journal of Psychological Medicine*, Vol. 40 No. 1, pp. 63-73.

Goldstein, J. M. (2006), "Sex, hormones and affective arousal circuitry dysfunction in schizophrenia", *Hormones and Behaviour*, Vol. 50 No. 4, pp. 612-622.

Goodman, A. and Goodman, R. (2009), Strengths and difficulties questionnaire as a dimensional measure of child mental health. *Journal of the American Academy of Child and Adolescent Psychiatry*, Vol. 48 No. 4, pp. 400-403.

Goodman, R. (1997), "The strengths and difficulties questionnaire: A research note", Journal of *Child Psychology and Psychiatry and Allied Disciplines*, Vol. 38 No. 5, pp. 581–586.

Guessoum, S.B., Benoit, L., Thomas, I., Mallet, J., Sibeoni, J., Hanin, C. and Moro, M.R., (2022), "Articulating biological and social approaches in child and adolescent psychiatry", *Frontiers in Child and Adolescent Psychiatry*, Vol. 1, Article no. 1065932.

Haag, K., Fraser, A., Hiller, R., Seedat, S., Zimmerman, A. and Halligan, S. L. (2020), "The emergence of sex differences in PTSD symptoms across development: Evidence from the ALSPAC cohort", *Psychological Medicine*, Vol. 50 No. 10, pp. 1755-1760.

Hart, T. and O'Reilly, M**.** (2022), **"**Perspectives on what schools and mental health services can do about bullying of adolescents with severe emotional health conditions" *Pastoral Care in Education*, Vol. 40 No. 1, pp. 4-24.

Heinrichs, R. R. (2003), "A whole-school approach to bullying: Special considerations for children with exceptionalities", *Intervention in School and Clinic*, Vol. 38 No. 4, pp. 195-204.

Hymel, S., and Swearer, S. M. (2015), "Four decades of research on school bullying: An introduction", *American Psychologist*, Vol. 70 No. 4, pp. 293-299.

Idsoe, T., Dyregrov, A. and Idsoe, E. C. (2012), "Bullying and PTSD symptoms", *Journal of Abnormal Child Psychology*, Vol. 40, pp. 901-911.

Idsoe, T., Vaillancourt, T., Dyregrov, A., Hagen, K. A., Ogden, T. and Nærde, A. (2021), "Bullying victimization and trauma", *Frontiers in Psychiatry*, Vol. 11, Article no. 480353.

Jenkins, L.N., Miller, H.H., Kaminski, S., and Putzeys, S. (2023), "Re-conceptualizing peer victimization as a potentially traumatic event", *International Journal of Bullying Prevention*, Vol. 5, pp. 151–160.

Jones, C. (2023), "School bullying: a social justice issue? How restorative approaches may prevent future violence", *Youth and Policy*

Kelleher, I., Keeley, H., Corcoran, P., Ramsay, H., Wasserman, C., Carli, V., Sarchiapone, M., Hoven, C., Wasserman, D. and Cannon, M. (2013), "Childhood trauma and psychosis in a prospective cohort study: Cause, effect, and directionality", *American Journal of Psychiatry*, Vol. 170 No. 7, pp. 734-741.

Kenny, D. A., West, T. V., Cillessen, A. H., Coie, J. D., Dodge, K. A., Hubbard, J. A. and Schwartz, D. (2007), "Accuracy in judgments of aggressiveness", *Personality and Social Psychology Bulletin*, Vol. 33 No. 9, pp. 1225-1236.

Kraan, T., Velthorst, E., Smit, F., de Haan, L. and van der Gaag, M. (2015), "Trauma and recent life events in individuals at ultra high risk for psychosis: Review and meta-analysis", *Schizophrenia Research*, Vol. 161 No. 2-3, pp. 143-149.

Laith, R. and Vaillancourt, T. (2022), "The temporal sequence of bullying victimization, academic achievement, and school attendance: A review of the literature", *Aggression and Violent Behaviour*, Vol. 64, Article no. 101722.

Le, H. T. H., Tran, N., Campbell, M. A., Gatton, M. L., Nguyen, H. T. and Dunne, M. P. (2019), "Mental health problems both precede and follow bullying among adolescents and the effects differ by gender: A cross-lagged panel analysis of school-based longitudinal data in Vietnam", *International Journal of Mental Health Systems*, Vol. 13, Article no. 35, pp. 1-10.

Lee, J. M., Kim, J., Hong, J. S. and Marsack-Topolewski, C. N. (2021), "From bully victimization to aggressive behaviour: Applying the problem behaviour theory, theory of stress and coping, and general strain theory to explore potential pathways", *Journal of Interpersonal Violence*, Vol. 36 No. 21-22, pp. 10314-10337.

Li, T., Chen, B., Li, Q., Wu, X., Li, Y. and Zhen, R. (2023), "Association between bullying victimization and post-traumatic stress disorders among Chinese adolescents: A multiple mediation model", *BMC Psychiatry*, Vol. 23, Article no. 758, pp. 1-10.

Loewy, R. L. and Cannon, T. D. (2010), *The Prodromal Questionnaire, Brief Version (PQ-B)*. University of California.

Mullan, V. M., Golm, D., Juhl, J., Sajid, S. and Brandt, V. (2023), "The relationship between peer victimisation, self-esteem, and internalizing symptoms in adolescents: A systematic review and meta-analysis", *PLoS One*, Vol. 18 No. 3, pp. 1-16.

Mohseny, M., Zamani, Z., Basti, S. A., Sohrabi, M. R., Najafi, A., Zebardast, J. and Tajdini, F. (2019), "Bullying and victimization among students bears relationship with gender and emotional and behavioural problems", *Iranian Journal of Psychiatry*, Vol. 14 No. 3, pp. 211-220.

Moore, S. E., Norman, R. E., Suetani, S., Thomas, H. J., Sly, P. D. and Scott, J. G. (2017), "Consequences of bullying victimization in childhood and adolescence: A systematic review and meta-analysis", *World Journal of Psychiatry*, Vol. 7 No. 1, pp. 60-76.

Mynard, H. and Joseph, S. (2000), "Development of the multidimensional peer victimisation scale", *Aggressive Behaviour*, Vol. 26, pp. 169-178.

Nielsen, M.B., Tangen, T., Idsoe, T., Matthiesen, S.B. and Magerøy, N. (2015), "Post-traumatic stress disorder as a consequence of bullying at work and at school. A literature review and meta-analysis", *Aggression and Violent Behaviour*, Vol. 21, pp.17-24.

Okewole, A. O., Ajogbon, D., Adeniji, A. A., Omotoso, O. O., and Awhangansi, S. (2015a), "Psychosis risk screening among secondary school students in Abeokuta, Nigeria: Validity of the prodromal questionnaire – brief version (PQ-B)", *Schizophrenia Research*, Vol. 164, pp. 281-282.

Okewole, A. O., Awhangansi, S. S., Fasokun, M., Adeniji, A. A., Omotoso, O. and Ajogbon, D. (2015b), "Prodromal psychotic symptoms and psychological distress among secondary school students in Abeokuta, Nigeria", *Journal of Child and Adolescent Mental Health*, Vol. 27 No. 3, pp. 215-225.

Okobi, O. E., Egbujo, U., Darke, J., Odega, A. S., Okereke, O. P., Adisa, O. T., Salawu, M. A. and Kimble, R. (2023), "Association of bullying victimization with suicide ideation and attempt among school-going adolescents in post-conflict Liberia: Findings from the global school-based health survey", *Cureus*, Vol. 15 No. 6, e40077.

Olashore, A. A., Akanni, O. O. and Olashore, O. O. (2017), "Associate factors of delinquency among incarcerated male juveniles in a borstal institution in Nigeria", *International Journal of Forensic Mental Health*, Vol. 16 No. 3, pp. 207-214.

Ossa, F. C., Pietrowsky, R., Bering, R. and Kaess, M. (2019), "Symptoms of posttraumatic stress disorder among targets of school bullying", *Child and Adolescent Psychiatry and Mental Health*, Vol. 13, Article no. 43, pp. 1-11.

Peng, C., Hu, W., Yuan, S., Xiang, J., Kang, C., Wang, M., Rong, F., Huang, Y. and Yu, Y. (2020), "Self-harm, suicidal ideation, and suicide attempts in Chinese adolescents involved in different sub-types of bullying: A cross-sectional study", *Frontiers in Psychiatry*, Vol. 11, Article no. 565364.

Raji, I. A., Bashir, S. S., Stephen, A. A., Umeokonkwo, C. D., Abubakar, A. U. and Sabitu, K. (2021), "Predictors of bullying perpetration among adolescents attending secondary schools in Sokoto Metropolis, Nigeria, 2019", *Pan African Medical Journal*, Vol. 39 No. 1, pp. e1-e12.

Ramikie, T. S. and Ressler, K. J. (2018), "Mechanisms of sex differences in fear and posttraumatic stress disorder", *Biological Psychiatry*, Vol. 83 No. 10, pp. 876-885.

Rauschenberg, C., van Os, J., Goedhart, M., Schieveld, J. N. and Reininghaus, U. (2021), "Bullying victimization and stress sensitivity in help-seeking youth: findings from an experience sampling study", *European Child and Adolescent Psychiatry*, Vol. 30, pp. 591-605.

Rosenfield, S. (2000), “Gender and dimensions of the self: Implications for internalizing and externalizing behaviour”, Frank, E. (Ed.), *Gender and its Effects on Psychopathology*, American Psychiatric Publishing, pp. 23–36.

Rudolph, K. D., Lansford, J. E., Agoston, A. M., Sugimura, N., Schwartz, D., Dodge, K. A., Pettit, G. S. and Bates, J. E. (2014), “Peer victimization and social alienation: Predicting deviant peer affiliation in middle school”, *Child Development*, Vol. 85 No. 1, pp. 124-139.

Şahin, S., Yüksel, Ç., Güler, J., Karadayı, G., Akturan, E., Göde, E., Özhan, A.A. and Üçok, A. (2013), “The history of childhood trauma among individuals with ultra high risk for psychosis is as common as among patients with first-episode schizophrenia”, *Early Intervention in Psychiatry*, Vol. 7 No. 4, pp. 414-420.

Salmivalli, C. (2010), “Bullying and the peer group: A review”, *Aggression and Violent Behaviour*, Vol. 15 No. 2, pp. 112-120.

Strauss, G. P., Raugh, I. M., Mittal, V. A., Gibb, B. E. and Coles, M. E. (2018), “Bullying victimization and perpetration in a community sample of youth with psychotic like experiences”, *Schizophrenia Research*, Vol. 195, pp. 534-536.

Sullivan, T. N., Farrell, A. D. and Kliewer, W. (2006), “Peer victimization in early adolescence: Association between physical and relational victimization and drug use, aggression, and delinquent behaviours among urban middle school students”, *Development and Psychopathology*, Vol. 18 No. 1, pp. 119-137.

Twemlow, S. W., Fonagy, P. and Sacco, F. C. (2002), “Feeling safe in school”, *Smith College Studies in Social Work*, Vol. 72 No. 2, pp. 303-326.

van Geel, M., Goemans, A., Zwaanswijk, W. and Vedder, P. (2022), "Does peer victimization predict future suicidal ideation? A meta-analysis on longitudinal studies", *Aggression and Violent Behaviour*, Vol. 64, Article no. 101577.

Wolke, D. and Lereya, S. T. (2015), "Long-term effects of bullying", *Archives of Disease in Childhood*, Vol. 100 No. 9, pp. 879-885.

Wong, M. K. R. (2016), "An exploratory study of the subjective traumatic school bullying experiences of adolescent victims who have later developed early psychosis", PhD Thesis, Hong Kong Polytechnic University.

Yu, S. and Zhao, X. (2021), "The negative impact of bullying victimization on academic literacy and social integration: Evidence from 51 countries in PISA", *Social Sciences and Humanities Open*, Vol. 4 No. 1, Article no. 100151.

Zhu, C., Huang, S., Evans, R. and Zhang, W. (2021), "Cyberbullying among adolescents and children: A comprehensive review of the global situation, risk factors, and preventive measures", *Frontiers in Public Health*, Vol. 9, Article no. 634909.

Disclosure statement

No conflicts of interest are noted. There has also been no financial interest or benefit arisen from this research. There is no funding attached to this work.

Table I: School-specific sampling interval

School	Size of subsampling frame*	School sample size	*k*-interval
School 1	272	120	2
School 2	196	98	2
School 3	151	87	2
School 4	129	67	2
School 5	144	39	4

*Total size of 3 selected classes in JS1, JS2 and JS3

Table II: Descriptive statistics.

		Mean (SD)	
MPVS (α)	**Overall (n = 351)**	**Male (n = 173)**	**Female (n = 178)**
Overall victimisation (.83)	9.58 (6.48)	9.80 (6.45)	9.35 (6.52)
Physical victimisation (.43)	3.17 (1.89)	3.35 (1.85)	2.99 (1.91)
Verbal victimisation (.61)	2.20 (2.05)	2.21 (2.06)	2.19 (2.05)
Social manipulation (.57)	1.94 (1.96)	2.01 (1.98)	1.88 (1.94)
Attack on property (.53)	2.27 (1.97)	2.23 (2.04)	2.30 (1.90)
SDQ (α)			
Internalising difficulties (.53)	6.23 (3.42)	5.91 (3.42)	6.54 (3.39)
Externalising difficulties (.56)	4.66 (3.24)	4.77 (3.31)	4.55 (3.17)
Emotional problems (.57)	3.21 (2.37)	3.03 (2.43)	3.39 (2.30)
Conduct problems (.38)	2.34 (1.95)	2.40 (1.87)	2.27 (2.02)
Hypersensitivity (.31)	2.32 (1.85)	2.37 (1.96)	2.28 (1.74)
Peer problems (.20)	3.02 (1.92)	2.88 (1.86)	3.16 (1.97)
Prosocial behaviour (.63)	7.56 (2.32)	7.46 (2.37)	7.65 (2.28)

		Percentage, %	
PTSD*	**Overall (n)**	**Male (n)**	**Female (n)**
Met diagnosis	7.1 (25)	6.9 (12)	7.3 (13)
Did not meet diagnosis	92.9 (326)	93.1 (161)	92.7 (165)
Prodromal psychosis*			
Met provisional diagnosis	73.5 (258)	75.1 (130)	71.9 (128)
Did not meet provisional diagnosis	26.5 (93)	24.9 (43)	28.1 (50)

*Cronbach's alpha (α) not calculated due to data type being categorical.

Table III: Correlations across the MPVS and SDQ (in all case, n = 351).

	1	2	3	4	5	6	7	8	9	10	11	12
1. MPVS physical victimisation	-											
2. MPVS verbal victimisation	.55**	-										
3. MPVS social manipulation	.56**	.67**	-									
4. MPVS attack on property	.51**	.59**	.53**	-								
5. Overall MPVS victimisation	.79**	.86**	.84**	.80**	-							
6. SDQ emotional problems	.13*	.21**	.22**	.18**	.22**	-						
7. SDQ conduct problems	.23**	.26**	.21**	.19**	.27**	.37**	-					
8. SDQ hyperactivity	.17**	.24**	.19**	.19**	.24**	.26**	.46**	-				
9. SDQ peer problems	.19**	.24**	.18**	.17**	.24**	.26**	.31**	.39**	-			
10. SDQ prosocial behaviour	-.03	.01	.02	-.01	-.00	-.05	-.30**	-.39**	-.28**	-		
11. SDQ externalising difficulties	.23**	.29**	.29**	.23**	.30**	.37**	.86**	.85**	.41**	-.40**	-	
12. SDQ internalising difficulties	.20**	.28**	.26**	.22**	.29**	.84**	.43**	.40**	.74**	-.19**	.49**	-

** p< .01; * p< .05

Table IV. Predicting SDQ emotional and behavioural problems from the MPVS bullying victimisation subscales (in all cases, n = 351).

	SDQ internalising difficulties			**SDQ externalising difficulties**			**SDQ conduct problems**			**SDQ hyperactivity**			**SDQ peer problems**			**SDQ emotional problems**		
Predictor (MPVS)	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**
Physical victimisation	.03	.12	.02	.15	.11	.09	.11	.07	.11	.03	.07	.04	.07	.07	.07	-.04	.08	-.03
Verbal victimisation	.28	.13	.17*	.32	.12	.20**	.17	.07	.18*	.16	.07	.17*	.18	.07	.19*	.10	.09	.08
Social manipulation	.18	.13	.13	.03	.12	.02	.01	.07	.01	.01	.07	.02	.00	.07	.00	.18	.09	.15*
Attack on property	.09	.12	.12	.09	.11	.05	.02	.07	.02	.06	.06	.07	.02	.07	.02	.07	.08	.06

** p< .01; *p< .05