

RESEARCH ARTICLE

School-Aged Bullying History, Post-Traumatic Stress Disorder (PTSD), and Depressive Symptoms: A Study of University Students in Malaysia

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Abstract: The present study investigated school-aged bullying history among university students in Sarawak and its relationship with depressive and PTSD symptoms and types of bullying. A total of 499 university students ($M_{age} = 19.52$, $SD = 1.58$) participated in this cross-sectional study, of which 72.1% ($n = 360$) were females and 27.9% ($n = 139$) were males. Results indicated a high prevalence of bullying history, 38.1% ($n = 190$); 21.4% ($n = 107$) identified as victims, 9.4% ($n = 47$) bullies (perpetrators), and 7.2% ($n = 36$) are bully-victims (being both perpetrators and victims). Participants with a bullying history scored significantly higher in depressive and PTSD symptoms. Based on the present findings, school-aged bullying history is one of the potentially traumatic events experienced by university students. The present findings contribute to the knowledge of the risk of developing depressive and PTSD symptoms. Prevention and intervention plans are needed to prevent school bullying from getting worse. Finally, it should be cautioned that this study adopted a convenient sample, and thus, the results cannot be generalized to other university students.

Keywords: School-aged bullying, depression, PTSD symptoms, university students, trauma

The impact of school-age bullying can be devastating. Incidents of school bullying reported by the Malaysian media have drawn public concern over aggressive behavior among adolescents because they have involved serious physical injuries and, in some cases, death of the victims (Yaakub et al., 2010; Saibon et al., 2012). Malaysian Global School-based Student Health Survey conducted among 25,507 students aged 13 to 17 years old in 2012 revealed that 17.7% of school students admitted engaging in bullying behavior (World Health Organization, 2012). It is believed that countless bullying cases remain unreported and are

perceived as part of normal growth experiences or school traditions (Wan Ismail et al., 2014).

Extensive studies have been conducted on bullying in recent years. Some studies explored the demographic variables of the students involved in bullying (Khamis, 2015; Wan Ismail et al., 2014), causes of bullying (Salleh & Zainal, 2014), characteristics of bullies and victims (Ndeti et al., 2007), and types or forms of bullying (Vambheim, 2010). Previous studies also examined the negative impacts of bullying, such as depression (Jamir & Devi, 2014; Uba et al., 2010; Md Isa et al., 2021), anxiety disorders (McCabe et al.,

2010), post-traumatic stress disorder (PTSD; Nielsen et al., 2015), and suicide ideation (van Geel et al., 2014). These findings serve as clear evidence that bullying is not just a temporary school problem; it also affects the long-term psychosocial adjustment and development of an individual (Ttofi et al., 2011).

A study conducted among elementary school students in the western part of Bosnia-Herzegovina reported that students who were identified as bully-victims (those who were both being bullied and bullied other students) reported more trauma symptoms such as anger, anxiety, dissociation, and post-traumatic stress, whereas the victims reported the highest levels of depressive symptoms (Obrdalj et al., 2013). The Malaysian educational system has a large number of full boarding schools in addition to standard day schools. Previous studies have shown that bullying cases in Malaysia were high and mostly associated with students who attended boarding schools (Chui & Chan, 2015 Pfeiffer & Pinquart, 2014). Studies conducted overseas have also shown that bullying behavior is more frequent in boarding schools (Chui & Chan, 2015 Pfeiffer & Pinquart, 2014). The Malaysian university student population comes primarily from these two school systems. The prevalence of PTSD and depressive symptoms among Malaysian university students is high. Ghazali et al. (2022) estimated that 9.6% of university students reported having PTSD symptoms, and 15.5% reported having depressive symptoms. Although previous studies suggested that mental health issues are caused by academic pressure and social adjustments in the university setting (Doyle-Baker et al., 2018; Horgan et al., 2016), there is a knowledge gap on the long-term association between school-aged bullying and university students' current mental health conditions. Perhaps we have neglected and underestimated issues related to school-aged bullying trauma experienced by our university students.

Despite the growing international interest in the potential risk factor of school-aged bullying history on the development of psychological issues, no empirical findings attempt to link school-aged bullying with symptoms of PTSD and depression. Our current study addresses a knowledge gap in the work of Espelage et al. (2016). Although Espelage et al. (2016) studied multiple childhood bullying trauma and other forms of victimization and psychological functioning in a college sample, we specifically focus on school-

aged bullying. Thus, the present study attempts to determine if there was a significant association between bullying behavior and the type of schools attended by the Malaysian university population. Additionally, the present study attempts to identify the significant contributor of school-aged bullying behavior to current levels of PTSD and depressive symptoms. This study attempts to answer the following research question: is there any significant association between PTSD, depressive symptoms, school-aged bullying trauma, and the type of schools the university students have attended? This study is important in the development of school-aged bullying trauma-specific intervention programs for our university student population.

Method

Participants

The present study adopted a cross-sectional design by looking at the history of school-aged bullying, PTSD, and depression among three public university students in Sarawak. A total of 506 students participated before excluding seven female participants from the analysis due to incomplete data. Of the remaining 499 participants, 72.1% ($n = 360$) were females, and 27.9% ($n = 139$) were males, aged between 18 to 26 years old ($Age = 19.52$, $SD = 1.58$). All participants were categorized as either bullies, victims, bully-victims, or not involved (no history of school bullying) based on their school-aged bullying history self-report (Table 1).

Sampling

Due to the sensitive nature of trauma-related and depressive symptoms surveys, we use convenience sampling or non-probability sampling. Students who were available, willing to participate, and volunteered to answer our questionnaire were recruited.

Data Collection Procedures

Participants were briefed about the study, their rights, risks, and issues of confidentiality. Written consent was obtained before the survey was conducted. This study was approved by the Research and Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak, the Ministry of Higher Education, and the participating public universities.

Measures

Socio-Demographic Information

This section gathered information on age, gender, ethnicity, year of study, and university of enrollment.

Bullying. Bullying was measured by Olweus Bullying Questionnaire (OBC; Olweus, 1996). OBC is a multiple-choice questionnaire designed to measure aspects of bullying problems in school and is also used to categorize participants as either bullies, victims, bully–victims, or not-involved. OBC has high internal consistency, with $\alpha = .80$ or higher reported for both measures of being bullied and bullying other students (Solberg & Olweus, 2003). In this study, Cronbach's alpha is .831.

Depression. Depression was measured by the Center for Epidemiology Study Depression Scale (CESD). It consists of 20 items in six scales measuring major dimensions of depression: sadness, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. Previously, CESD has shown high internal consistency ($\alpha = .85$ to $.90$) and test-retest reliability (.45 to $.70$; Ghazali et al., 2016; Radloff, 1977). In the current study, the internal consistency is $\alpha = .81$. The translated Malay version of CESD has been found to have satisfactory properties with a cut-off score of 27 recommended to distinguish participants with and without depression among Malaysian populations (Ghazali et al., 2016).

PTSD Symptoms. PTSD symptoms were measured by Post-traumatic Stress Disorder Checklist for DSM-5 (PCL-5). Consisting of 20 items, PCL-5 is a screening tool for assessing the symptoms of post-traumatic stress disorder corresponding to the DSM-5 symptoms criteria. Total score ranges from 0 to 80, with a recommended cut-off score of 33 to distinguish participants with and without severe symptoms of post-traumatic stress disorder (Bovin et al., 2016). PCL-5 has been shown to have good internal consistency ($\alpha = .96$), test-retest reliability ($r = .84$), and convergent and discriminant validity (Bovin et al., 2016). In this study, the internal consistency is $\alpha = .93$.

Analysis

Data were analyzed using the IBM SPSS statistics version 21. A descriptive analysis of socio-demographic characteristics, prevalence, duration, forms of bullying, and student perceptions of the bullying situation at

school were reported. Analysis of variance (ANOVA) was used to analyze mean differences, and an independent t-test was used to analyze categorical data between bullies, victims, bully–victims, and not-involved participants respective to their score for PTSD and depressive symptoms.

Results

Prevalence

School-Aged Bullying History Prevalence

A majority (58.3%, $n = 291$) of the 499 participants reported they were exposed to one or more forms of bullying at least once or twice during school age. There were 38.1% ($n = 190$) of the 499 participants reporting a history of bullying, with 21.4% ($n = 107$) reporting being bullied or identified as victims, 9.4% ($n = 47$) reporting bullying other students or identified as bullies, and 7.2% ($n = 36$) reporting both being bullied and bullying other students or identified as bully–victims (Table 1).

Descriptive analyses show that the most common forms of bullying reported by victims were hurtful teasing (18.6%), followed by social exclusion (10%), racial comments (7.4%), bullying in general (7.4%), spreading lies or false rumors (6.4%), comments or gestures with sexual meaning (5.6%), another way not listed (4.4%), being threatened or forced to do things (2.6%), cyber-bully (mobile or internet; 2.4%), belongings were taken (2.2%), and physical bully (hit, kicked, pushed; 1.4%). The remaining 61.9% ($n = 309$) of the participants reported no history of bullying or identified as not-involved.

There was no significant gender difference in being victims of school bullying. Approximately 45.7% ($n = 228$) of the participants reported they were involved or joined in bullying others at least once or twice during school age. However, only 9.4% ($n = 47$) of the participants were identified as bullies. There was a significant gender difference in reporting the history of being bullies at school, $\chi^2 = 28.42$, $p < .001$, with more males (30.9%) than females (11.1%) being bullies. Bully–victims were identified by combining both the measure of being bullied and bullying other students, giving 7.2% ($n = 36$) identified as bully–victims. Significantly more males (12.9%) were reported to be bully–victims than females (5%), $\chi^2 = 9.47$, $p = .003$ (Table 2).

Table 1*Descriptive Statistic of Participants*

Characteristic	Total sample (N)	Percentages (%)
Gender		
Female	360	72.1
Male	139	27.9
Race (%)		
Malay	293	58.7
Iban	59	11.8
Bidayuh	26	5.2
Melanau	23	4.6
Chinese	17	3.4
Indian	10	2.0
Others (Kadazan, Bisaya, Kenyah, etc.)	71	14.2
Bully history		
Not-involved	309	61.9
Victim	107	21.4
Bully	47	9.4
Bully-Victim	36	7.2
Type of schools attended		
Non-boarding	264	52.9
Boarding	213	42.6
Levels of study		
Foundation/Diploma Preparatory	81	16.2
Diploma	256	51.3
Bachelor Degree	162	16.2

Table 2*Bullying Involvement Based on Gender*

	Males (<i>n</i> = 139) (%)	Females (<i>n</i> = 360) (%)	Chi-Square (χ^2)
Victims	23.7% (<i>n</i> = 33)	20.6 % (<i>n</i> = 74)	$\chi^2 = 0.60, p = .466$
Bullies	30.9% (<i>n</i> = 43)	11.1% (<i>n</i> = 40)	$\chi^2 = 28.42, p < .001^*$
Bully-Victims	12.9 % (<i>n</i> = 18)	5.0% (<i>n</i> = 18)	$\chi^2 = 9.47, p = .003^*$
Not-Involved	45.3 % (<i>n</i> = 63)	68.3% (<i>n</i> = 246)	$\chi^2 = 22.52, p < .001^*$

Note. Percentages is within participants' gender.

**p* < .05

Prevalence of PTSD Symptoms

Descriptive analysis of PCL-5 shows that of the 499 participants, 11.8% ($n = 59$) exhibited PTSD symptoms with a cut-off score of ≥ 39 as recommended by Wortmann et al. (2016) for university students. No significant difference was found between males and females in reporting PTSD symptoms ($t_{(2,493)} = 1.89, p > .05$).

Prevalence of Depression

Descriptive analysis of CESD shows that 17.8% ($n = 89$) of participants reported having depressive symptoms, with 83.1% ($n = 74$) female and 16.8% ($n = 15$) male. No significant difference was found between males and females in reporting depressive symptoms ($t_{(2,493)} = 1.89, p > .05$).

PTSD Symptoms and Type of School Bullying

An independent t -test shows that students with school-aged bullying history reported high levels of PTSD symptoms ($M = 21.62, SD = 15.96$) as compared to students reporting no history of bullying ($M = 16.56, SD = 15.13$), $t_{(497)} = 3.555, p < .000$. One-way analysis of variance found significant differences between bullies, victims, bully-victims and not-involved students in their levels of PTSD symptoms ($F_{(3,495)} = 8.56, p < .001$). Bully-victims reported higher mean scores of PTSD symptoms as measured by PCL-5 ($M = 25.06, SD = 16.55$) as compared to victims ($M = 23.47, SD = 15.82$), not-involved ($M = 16.56, SD = 15.13$), and bullies ($M = 14.79, SD = 14.03$).

Depressive Symptoms and Types of School-Age Bullying

Of the 190 participants reporting previous involvement in bullying (bullies, victims, and bully-victims), 22.1% ($n = 42$) reported having depressive symptoms. One-way analysis of variance found significant differences in depressive symptoms score ($F_{(3,495)} = 6.49, p < .001$) with victims ($M = 21.21, SD = 11.66$), scoring higher than bully-victims ($M = 17.83, SD = 10.84$), not-involved ($M = 16.50, SD = 9.81$), and bullies ($M = 15.36, SD = 7.44$).

Bullying History and Type of Schools Attended

In this analysis, 22 out of 499 participants were excluded due to missing information on the types of schools previously attended. Of the 477 participants, 55.3% ($n = 264$) attended non-boarding schools, whereas 42.6% ($n = 213$) attended boarding schools. Of the 38.1% ($n = 190$) participants who reported involvement in bullying, participants who previously attended non-boarding schools reported higher involvement in bullying—19.9% ($n = 95$) compared to participants who previously attended boarding schools, 18.5% ($n = 88$) (refer to Table 3). However, the Pearson chi-square analysis showed no significant association between bullying history and type of schools previously attended, $\chi^2 = 6.73, p = .081$.

Table 3

School-Aged Bullying History and Type of Schools Attended (N = 477)

Bullying history	Boarding schools (n = 213)	Non-boarding schools (n = 264)	Total (n = 477)
Bullies	3.6% (17)	6.3% (30)	9.9% (47)
Victims	10.5% (50)	10.9% (52)	21.4% (102)
Bully-victims	4.4% (21)	2.7% (13)	7.1% (34)
Not-Involved	26.2 (125)	35.4% (169)	61.6% (294)
Total	44.7% (213)	55.3% (264)	100% (477)

Note. No significant association between bullying history and the type of schools attended.

Discussion

School-Aged Bullying History Prevalence

The prevalence of bullying history is high (38%) among university students in Malaysia. This finding is consistent with the phenomena of school-aged bullying in previous studies (Craig et al., 2009; Khamis, 2015; Vambheim, 2010; Wei et al., 2016). The prevalence of school-aged bullying history was 40% in South Korea (Kim et al., 2004), 36.3% in South Africa (Liang et al., 2007), 31.4% in India (Kshirsagar et al., 2007), and 20.83% in Guangdong, China (Wang et al., 2012). Thus, at the moment, we can safely estimate that between 30% to 40% of our children at least once had bullying experience in their lifetime.

Prevalence of Being a Victim

The most prevalent type of bullying was being the victim (21.4%), followed by bullies (9.4%), and a significantly lower percentage of bully-victims (7.2%). University students recalled the history of being a victim of school-aged bullying at a similar prevalence to the finding reported by the World Health Organization (WHO) Global Health School Survey in Malaysia (WHO, 2012) conducted among school students aged 13 to 15 years old. This finding is also consistent with WHO Global Health School Survey conducted in South East Asian countries such as Brunei (WHO, 2014), Thailand (WHO, 2008), and Vietnam (WHO, 2013) but slightly lower than research conducted among college students in the United States (Adams & Lawrence, 2011; Holt et al., 2014), and Singapore (Ong et al., 2010). The difference may be due to the use of different instruments, bullying operational definitions, and research methodology. For example, in the present study, the prevalence of different types of bullying was also measured. This includes being victims, bullies, and bully-victims, whereas the other studies only include being the victims of bullying.

Results found that 7.2% had experienced being bullied while being involved in bullying others. The most common forms of bullying reported by both bullies and victims in the present study were verbal bullying (such as hurtful teasing and racial comments), social exclusion, and the general experience of being involved in school-aged bullying. This finding is consistent with the previous findings (Khamis, 2015; Stoddard et al., 2015; Wang et al., 2009), which

emphasized that verbal bullying is the most common form of bullying because most students justified it as a form of teasing.

Both bullies and victims reported physical bullying and cyberbullying as the least prevalent form of bullying. It is reasonable to speculate that verbal bullying is the most common type of bullying, but children might not realize that it can lead to physical bullying. In some cases, the bullies claimed that they were verbally abused by the victims, which led them to become aggressive and fight back. For example, children who were teased because of their physical appearance for a long period of time might take revenge by physically abusing the perpetrators, which, in turn, leads to the teacher being unable to identify who is the victim and who is the bully. Myers et al.'s (2013) finding supported this, emphasizing that victims often perceived their friend's teasing as hostile and consisting of verbal abuse and insults. Thus, bullying prevention programs should remind us that verbal bullying can be as severe as other forms of bullying. Teachers and parents sometimes fail to take action when their children report being teased, instead responding by telling children that it is just a kind of teasing or kidding between kids. Because children spend more time at school, teachers should take note and act when teasing between students happens regularly and for a long period of time.

Studies addressing different types of school bullying are very limited. Thus, direct comparison is quite difficult. It can still be concluded that the prevalence of students who reported being victims of school-aged bullying is high, as reported by the current and previous studies. This finding highlights the importance of monitoring school bullying incidents in every school system in the nation. Perhaps students should be given more options in reporting bullying incidents to allow more rapid intervention. For example, they are given the option to report it online via a website or complaint boxes easily accessible around the school compound. Informal and confidential options for reporting might encourage students to report, allowing assessment and intervention to be implemented more rapidly.

Prevalence of PTSD Symptoms

Present findings show that 11.8% of university students report having PTSD symptoms which is consistent with previous studies (Lawler et al., 2005; Frazier et al., 2009). Frazier et al. (2009) found that

the prevalence was 8% with a PCL-5 cut-off score of 50. It is speculated that the high prevalence of PTSD among Malaysian university students could be due to higher lifetime trauma exposure. Frazier et al. (2009), Lawler et al. (2005), Vernon et al. (2009), and Zheng et al. (2012) estimated that 76% to 99% of university students had at least one lifetime trauma exposure. The present study also shows that those who have PTSD symptoms tend to score higher in depression. Zheng et al. (2012) have found similar findings among adolescents who had trauma exposure during the Wenchuan Earthquake in China. This finding highlights the importance of evaluating depressive symptoms where psychological assessment indicates a positive outcome of PTSD symptoms. Practitioners in the university health and counseling center should be aware of the importance of screening depressive symptoms when PTSD symptoms are found to be significantly elevated. Additionally, although lifetime trauma and PTSD symptoms are mostly neglected mental health issues, more focus should be given to this aspect of mental health promotion and prevention programs.

Prevalence of Depression

Prevalence of depressive symptoms among participants was 17.8%. This finding is consistent with Song et al. (2008). They found that the prevalence of depression among Hong Kong university students was 17.6%. Similarly, Vazquez and Blanco (2006) found 16% depression prevalence in their sample. Both studies used the same instrument but with slightly lower cut-off scores, that is, 25 and 24, respectively. Meanwhile, other studies found a significantly higher prevalence of depression ranging from 30% to 37.7% (Shamsuddin et al., 2013; Mikolajczyk et al., 2008). Shamsuddin et al. (2013) found that the prevalence of depression among Malaysian university students was significantly higher, as measured by DASS-21. It is recommended that one standardized instrument be adopted to measure depression among the Malaysian population.

PTSD Symptoms and Type of School Bullying

The present study found significant differences between bullies, victims, bully-victims, and not-involved participants with respect to their overall symptoms-score of PTSD. Bully-victims and victims reported higher mean scores of PTSD symptoms as

compared to bullies and not-involved participants. As suggested by previous researchers (Elklit & Petersen, 2008) that school-aged bullying be recognized as a potentially traumatic event, the present study found significant differences between bullies, victims, bully-victims, and not-involved participants respective to their overall symptoms-score of PTSD. Present findings support the notion that bully-victims and victims were at risk of suffering post-traumatic stress and PTSD symptoms (Khamis, 2015; Nielsen et al., 2015; Obrdalj et al., 2013; Pegolo de Albuquerque & Williams, 2015; Takizawa et al., 2014). For both victims and bully-victims, the psychological injuries resulting from the experience of being bullied during school age leave a lasting impact that leads to the development of PTSD symptoms among university students in the present study. However, it is important to highlight that even though victims and bully-victims reported higher scores of PTSD symptoms, the mean score for both groups do not fall into the clinical range of PCL-5. This could be explained by other variables, such as resilience, which may contribute to minimizing the negative effects of school-aged bullying history.

Depression in Relation to Types of School-Age Bullying

Significant differences were found in depressive symptoms scores among bullies, victims, bully-victims, and the not-involved. Victims scored higher in depressive symptoms than bully-victims and bullies, consistent with previous findings (Fleming & Jacobsen, 2009; Uba et al., 2010a; Ttofi et al., 2011; Holt et al., 2014). Victims were found to score higher on the depression total score, followed by bully-victims, non-involved students, and bullies. This finding further supports the notion that the experience of being a victim of school-aged bullying is a significant factor for later depression (Fleming & Jacobsen, 2009; Ttofi et al., 2011). The experience of being bullied may result in overwhelming feelings of helplessness and worthlessness, which leads to the development of depressive symptoms. Bully-victims scoring slightly lower depressive symptoms than victims could be because they release feelings of helplessness when they bully other students. Thus, although the students have left school for some time, the memory of being involved in a bullying situation persists over time, and this could disturb their psychological health as they pursue their studies at the university.

Bullying History and Type of Schools Attended

Regardless of the type of schools attended, university students reported a similar pattern of school-aged bullying history. This finding contradicts the conclusion made by previous researchers reporting that bullying happened frequently in boarding schools as compared to non-boarding schools (Lester & Mander, 2015; Lester et al., 2015). Hence, it cannot be concluded that students who attended boarding schools in Malaysia were at risk of being involved in school-aged bullying as compared to those who attended non-boarding schools. Perhaps the school administration of boarding schools in Malaysia has managed to adopt a bullying prevention program, and the students were bound to abide by strict rules and regulations upheld by the school administration. One of the bullying prevention programs adopted in Malaysian schools is “Say No to Bully,” where the students were encouraged to report any bullying incident that happened in the school compound.

Limitations

As the present study is cross-sectional in nature, it cannot support causal interpretations between the variables investigated. Rather, results only yield significant evidence of a relationship between the variables investigated. Yet, these findings could be used in the development of effective interventions combatting school-aged bullying in Malaysian schools. Caution must be used in generalizing from the findings; because only university students were included in the present study, findings cannot be generalized to individuals who did not enroll in university, dropped out, or reside in juvenile centers. The non-probability sampling method used also presents a limitation. Because the participants were recruited based on their availability, they may not be representative of all of the students in their respective university. Nevertheless, this study contributes to the growing body of knowledge that students with a history of school-aged bullying suffer long-term negative effects, specifically PTSD and depression.

Conclusion

The high prevalence of school-aged bullying history among university students calls for urgent awareness

as it is correlated with significantly high scores of depressive and PTSD symptoms among victims and bully–victims. PTSD and trauma as a result of school-aged bullying should be given serious attention by the school administration, particularly for those students who are residing in the boarding school system. School counselors should provide immediate intervention to students affected by bullying so that it will not lead to the development of PTSD and depressive symptoms. Regardless of the incidence or rates of bullying cases, frequent awareness of bullying is important to reduce and one day eliminate bullying cases in our school system. This study provides an awareness of the devastating incidence of bullying in Malaysian schools, which leads to the development of PTSD symptoms among victims and bully–victims of university students. Early detection of these symptoms, especially suicide ideation, should be carried out nationally among students who have reported involvement in bullying.

Recommendations

The prevalence of school-aged bullying history is high among university students in Malaysia. University psychologists and counselors should be aware of the importance of screening depressive symptoms when PTSD symptoms are found to be significantly elevated. Victims and bully–victims were found to report significantly high scores of depressive and PTSD symptoms as compared to bullies and not-involved students. Hence, it is important to highlight that the experience of being bullied is significantly associated with depressive and PTSD symptoms among university students in Malaysia. School counselors should be encouraged to conduct psychological health screening regularly among school students who are involved in bullying situations. Finally, there is a need to understand the complexity of bullying situations that lead to the development of PTSD symptoms. It may be useful for future research to investigate the specificity of each PTSD symptom and how they affect bullying victims over a long period of time.

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Declaration of Ownership

This report is our original work.

Conflict of Interest

None.

Ethical Clearance

This study was approved by our institution.

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