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Correlates of Peer Violence Among 13- to 15-Year-Olds in Gampaha District Schools in Sri Lanka: Findings From a Comparison Between Violent and Non-Violent Adolescents

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Abstract

Violence among adolescents in schools is a relatively new research area in South Asian countries. Limited knowledge about factors associated with peer violence hinders the design of prevention programs. This study was carried out to assess correlates of peer violence among 13- to 15-year-old adolescents in Gampaha district schools in Sri Lanka. A cross-sectional study was carried out to identify "violent" and "non-violent" adolescents. Study and control populations were identified based on their participatory roles in violence, and an unmatched case–control (1 case: 1 control) analysis was carried out to assess correlates of peer violence. Bronfenbrenner's ecological model was used, and correlates were determined for both physical and relational (verbal and non-verbal) violence. Correlates of both physical and relational peer violence were male sex, being 13 years of age, mental health difficulties, dating relationships, school absenteeism, witnessing physical fights among neighbors, and crime-dense residence. Factors associated with peer violence operate at several levels: individual, family/peer relationships, community, and societal. Most of these factors are modifiable and can be targeted by prevention programs.

Keywords

correlates, adolescents, peer violence, physical violence, relational violence, ecological model

Introduction

Sri Lanka has experienced a three-decade-long civil war, which disintegrated and displaced families in many parts of the island. Furthermore, the country has undergone industrialization, urbanization, and globalization, which have led to social changes such as transition of agricultural economy into industrial economy, population redistribution according to economic opportunities and disintegration of extended families into nuclear families. Some of these transitions have led to adaptation of unhealthy behaviors such as working for long hours, lack of leisure time, harmful alcohol or other substance use and harmful use of modern technology (Gunatilleke, 1978, 1993). The above behavioral changes have led to negative consequences such as occupational stress, poor family and social interactions, psychological distress, aggression and violence. Adolescents, who constitute 20% of the 19.9 million Sri Lankan population (Department of Census and Statistics [DCS], 2009), also are directly and indirectly affected by the above-mentioned consequences.

Available research findings on violent behavior among adolescents in Sri Lanka suggest that peer violence in schools is a major public health issue (Hewamalage, 2010; United Nations Children's Fund [UNICEF], 2004; Wijesekera, 2003). The National Survey among adolescents (n = 29,911) in schools reported that 75% of respondents had experienced some form of peer harassment in school (UNICEF, 2004). A study carried out among 630 adolescents (M_{age} = 16.5 years) in Kalutara district schools in Sri Lanka found that more than 50% of adolescents had been either "victimized" or had "perpetrated" physical violence during a period of 6 months preceding the study (Wijesekera, 2003). Another study (n = 246) on school violence among Grade 10 students in Colombo district, Sri Lanka, also revealed a high prevalence of physical (51%) and verbal (41%) violence during the preceding 6

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months (Hewamalage, 2010). Furthermore, repeated incidents of violent behaviors among adolescents in schools highlighted in the mass media during the recent past can be considered as anecdotal evidence of how common peer violence among adolescents in schools in Sri Lanka has become a growing problem.

As described in the literature, violence among peers in schools is a multifaceted construct that involves a variety of forms such as physical violence, verbal derogation, or passive obstruction (non-verbal violence such as not caring, excluding from company, etc.; Gumpel, 2008). Violence is a learned behavior, and attempts to prevent it may be most successful by targeting adolescents at school (World Health Organization [WHO], 1996). Preventing violence is not only a sound investment, but is also a prerequisite for healthy societies. At present, there is no national plan in Sri Lanka that addresses different forms of violence. The paucity of information on factors associated with peer violence is the main obstacle to the design of more comprehensive, tailored, school-based violence prevention programs with primary prevention strategies. In spite of the available literature that indicates that peer violence is a major public health issue in Sri Lanka (Hewamalage, 2010; UNICEF, 2004; Wijesekera, 2003), none of these studies have explored the wider context of peer violence, which results from the interplay among the adolescent, others in the community, and the broader society.

To understand peer violence among adolescents in schools and to successfully prevent and handle this phenomenon, multiple factors at the individual, relationship, community, and societal level must be examined. Bronfenbrenner's (1979) ecological model is useful for this purpose as it situates an individual at the center of micro-, meso-, exo-, and macro-systems and proposes that behavior is influenced by the interactions within and among these systems (Figure 1).

At the individual level, factors that affect the potential for violent behavior include biological, psychological, and behavioral characteristics of the adolescent. These factors may already be present in childhood or adolescence, and to a varying degree, may be influenced by a person's family, community, and environment (Bronfenbrenner, 1979). Adolescent's relationship to individuals and groups of individuals immediately around him or her with whom he or she interacts (e.g., family, peer groups, school) referred as the micro-system. These interactions, such as parenting practices, family violence, adolescent–teacher relationships, and peer relationships, shape the adolescent (Bronfenbrenner, 1994). A meso-system refers to a network of relationships between and among the micro-systems in which the adolescent is involved (Bronfenbrenner, 1994). For example, interactions between the adolescent–teacher and adolescent–peers micro-systems; that is, interactions in one system (adolescent–teacher) may affect interactions in the other system (adolescent–peers). The exo-system consists of interactions between two or more settings, but the adolescent is embedded in only one (e.g., for an adolescent, the relationship between home and parent's workplace; for a parent, the relationship between school and the neighborhood peer group). Since the 1980s, researchers have mostly focused on three exo-systems that are likely to affect the development of adolescents indirectly through their influence on the family, the peer groups, and the school. These are parents' workplace, family social network, and neighborhood–community contexts. The macro-system, which Bronfenbrenner (1994) referred to as a cultural "blueprint," is the broadest level of influence. The macro-system comprises an overarching pattern for the micro-, meso-, and exo-systems that are characteristic of a particular culture, subculture, or other broader social contexts. Religious beliefs and policies are examples of macro-systems that can influence social structures and activities (Bronfenbrenner, 1977). They can shape adolescents' behaviors and their relationships with their peers.

Being "violent" is an ambiguous concept which is understood in varying ways by different cultures and societies; its occurrence and recognition in a country is dependent on a number of issues at both macro- and micro-levels (Krug et al.,2002). Therefore, the findings related to violence in one setting may not be directly transferable to another. More detailed and updated information on factors associated with peer violence from Sri Lanka is needed to design locally relevant violence prevention programs. With this background, this study aimed to determine correlates of peer violence among adolescents in schools. The study focused on adolescents aged 13 to 15 years, as previous studies have identified this to be the peak age for violence among adolescents (Krug et al.,2002; UNICEF, 2004).

Method

A cross-sectional study was carried out from June to December 2010 in Gampaha district, Sri Lanka. Among the three districts in Western province, Gampaha is the second most populous district with a total population of 2.1 million (12.3% of the total population in the country). There are 4 educational zones and 13 educational divisions in Gampaha district. The choice of Gampaha district as the study setting was done because the researchers were familiar with the regional administrative setup for education in the district and this facilitated the logistic arrangements for the data collection. The participants were 13- to 15-year-old adolescents studying in state sector schools. The required size of the sample was calculated based on the formula ($n = [1.96]^2 \times p[1 - p] / d^2$) for prevalence estimation (Lwanga & Lemeshow, 1991). In this calculation, the prevalence of peer violence involvement among adolescents in schools was assumed to be 50% based on the data from a previous local study (Wijesekera, 2003) and "d," the absolute precision, was set at 0.05. When considering a correction for a design effect of 4, the required sample size was estimated to be

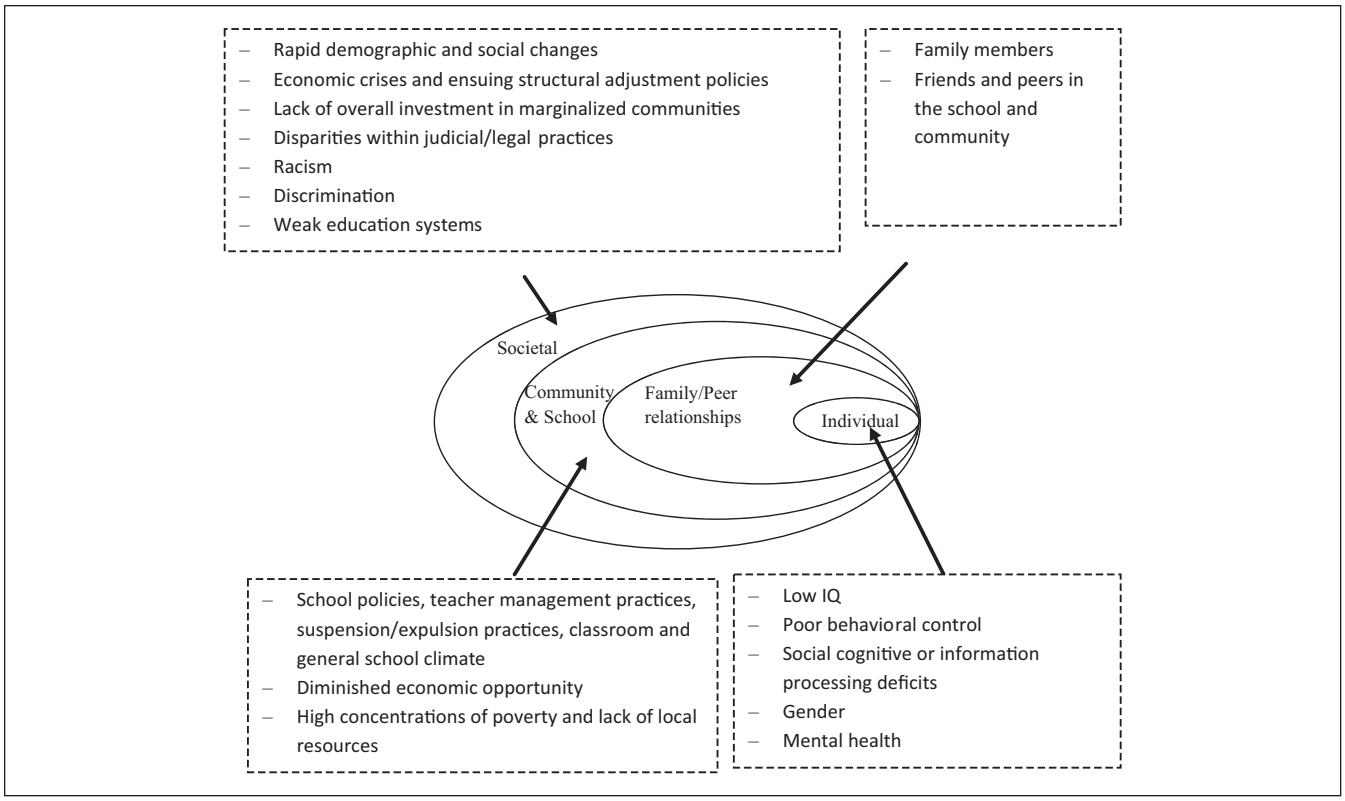

Figure 1. Ecological model for involvement in violence.
Source. Adapted from World Health Organization (2002).

1,536. A 14% non-response rate was assumed and adjusted for, giving a required sample size of 1,751.

The sample was selected using a multistage cluster sampling technique. Adolescents who were 13 to 15 years old and studying in government schools in Gampaha district were eligible to participate in the study. All four educational zones in the district were included. Two-stage sampling was used to select the schools to be included. In the first stage, four educational divisions (Kelaniya, Attanagalla, Meerigama, and Katana), one from each educational zone, were randomly selected. In the second stage of sampling, seven schools were randomly selected from each education division, that is, altogether 28 schools. A classroom was considered as a cluster, and at the third stage clusters were sampled from Grades 8 to 10 (in which adolescents of 13 to 15 years were studying) in proportion to the size of the student population in each of these grades in Gampaha district. The cluster size was assumed to be 20, and 88 clusters from 28 schools were included in the study to select 1,751 participants.

Data collection was conducted via a self-administered questionnaire (SAQ), which included two major parts.

Part I: The Sri Lankan Early Teenagers' Violence Inventory (SLETVI) is a self-administered tool developed and validated by the authors (Wijeratne et al., 2014) to measure peer violence in schools. In developing this inventory, a comprehensive literature review and focus group discussions (FGDs) among adolescents, their teachers and parents, and a series of consultative meetings with experts in the field were completed. The resulting information was used to operationalize the definition of peer violence and to identify and finalize the items to be included in the inventory. Being a victim to peer violence among adolescents in school is defined by SLETVI as "being physically or psychologically hurt as a result of a specified violent act committed by a child in his/her school/in another school/in a tuition class." Similarly, being a perpetrator of peer violence in school is defined as "subjecting a child in his/her school/in another school/in a tuition class to a specified violent act with the intention of hurting him/her physically or psychologically." The inventory (SLETVI) is comprised of physical, verbal, and non-verbal or gestural forms of violent acts. The term *relational violence* is used in the present study to collectively describe verbal and non-verbal or gestural forms of violence. The SLETVI measured "physical violence" with 20 items: pinching, scratching, pulling hair, pulling by tie/dress, pulling ear, knocking on the head, slapping, hitting with the fist, slapping ears, shoving, kicking, throwing objects, hitting head against some object, dragging along the floor, choking, burning, assaulting with a pole, assaulting with a sharp

weapon, assaulting with other weapons, and hitting genitals. Similarly, SLETVI measured "relational violence" with17 items: name calling, excluding from company or not caring, teasing or laughing sarcastically, not allowing to be a member of a group, not allowing to sit with a friend, not allowing to do things he or she likes, not allowing to play with others, pitting friends against him or her, tattle tale to put teachers against him or her, using bad words, looking down upon, threatening, stealing or taking belongings forcefully, telling tales about or spreading rumors, forcing to involve in dating relationships, forcing to continue dating relationships, and threatening via phones, text messages, and so on.

The SLETVI measures involvement in violence during the past 6 months. Considering previous research approaches to measure peer violence, the study team experts agreed that 6 months was the most appropriate duration to recall the experiences with minimum recall bias (Fernandopulle, 2000; Hewamalage, 2010; Wijesekera, 2003). Both victimization and perpetration of physical and relational violence can be examined using SLETVI. This allows for identification of adolescents' participatory role in violence (pure victims, pure perpetrators, mixed perpetrator–victim, and uninvolved). The developed inventory has been found to have good face and content validity assessed using a scoring system by a multidisciplinary panel of experts. Although peer sexual violence acts were included in the draft stages of the inventory, they were deemed uncommon in the Sri Lankan school setting and received very low scores at the stage of validity assessment, which resulted in these items not being included in the final inventory.

Part II: A SAQ and a data extraction sheet (to collect data using available school records) were used to collect data on correlates of peer violence. In developing the data collection instrument, an extensive literature search was done both manually and electronically using the terms "peer violence," "adolescents' violence," "youth violence," "school violence," "risk factors," "predictors," "correlates," and "associated factors" as keywords. The factors identified through the search of literature were categorized as outlined in the Bronfenbrenner model (Figure 1): individual, family and peer relationship, community and school-related, and societal correlates. A series of FGDs among adolescents, teachers, and parents were also conducted to identify variables, applicable in the Sri Lankan context.

The individual correlates assessed in this study are age, sex, self-esteem assessed using the Rosenberg self-esteem scale (Rosenberg, 1979), mental health difficulties assessed using the validated Sinhala translation (H. Perera, 2004) of the "Strength and Difficulties Questionnaire" (SDQ; Goodman, 2001), smoking, use of alcohol, use of mood altering drugs, and having been a victim to sexual abuse.

The family and peer relationship correlates assessed in this study are level of parental education, employment status of parents, mother/father in foreign employment, single-parent family, mother/father staying away from home, family support to relieve worries, perceived level of love and affection by parents/family members, level of adolescent–parent interaction, perceived level of appraisal of educational or other achievements by family members, time spent by parent/guardian with adolescent during a usual school day, corporal punishments by parents/guardians, verbal abuse by parents/guardians, fights with siblings, conflicts among parents/family members, conflicts between family members and neighbors, alcoholism of parents/guardians, weapon availability at home, dating relationships, aggressive friends ("How many close friends behaved aggressively during the past 6 months?"), and friends who frequently run away from school ("How many close friends ran away from school during the past 1 year?").

The community and school-related correlates assessed in this study are witnessing verbal/physical aggression among neighbors; witnessing destruction of property by neighbors; presence of gangs in the area of residence; availability of weapons in the area of residence; occurrence of crimes in the area of residence; school performance (assessed with the adolescent's average rank at the school assessments during past year); adolescent's school absenteeism; subjecting to corporal punishment/verbal abuse by school teachers/principal; existence of places where students could buy or get cigarettes, alcohol; availability of mood altering drugs in the school neighborhood; and existence of a place where students could watch blue-films nearby the school.

Societal correlates assessed were access to mobile phones, access to Internet, Internet use for long hours, watching the television for long hours, watching movies for long hours, and preference for action movies.

The questionnaire was finalized by the multidisciplinary panel of experts, assessed for face and content validity, and pretested among a sample of 15 adolescents in a school in Colombo district. Test–retest reliability of the instrument within a period of 1 week was assessed using Cohen's kappa. This revealed that the inventory (SLETVI) had good reliability with a Cohen's kappa coefficient of .86, and that all of the items in the SAQ (Part II) had a good reliability with minimum Cohen's kappa coefficient of .76. The SLETVI consists of four subscales assessing physical violence and relational violence in relation to victimization and perpetration. There was satisfactory internal consistency for the four subscales in the three-factor model (less severe, severe physical, and severe relational violence) with Cronbach's α exceeding .78 for every subscale (ranging from .78 to .92). Mental health symptoms were assessed with a composite scale SDQ which had five subscales, with Cronbach's α exceeding .80 for every subscale. This tool has been previously validated among Sri Lankan adolescents (H. Perera, 2004). Self-esteem was assessed with the Rosenberg self-esteem scale (Rosenberg, 1979), which had been translated into Sinhala. It had internal consistency of .86 by Cronbach's α in this sample.

Ethical clearance was obtained from the Ethical Review Committee of Colombo University, Sri Lanka. Administrative clearance for data collection was obtained from the Director of Education—Western Province, Zonal Directors, and Principals of all selected schools for data collection. Informed and written consent was obtained from parents or guardians of all study participants. For this purpose, an information sheet was sent to the parents/guardians of adolescents along with a consent sheet, which also included contact details of the Principal Investigator in case any clarification regarding the study was required. Only the adolescents who had parental consent and were willing to participate were enrolled in the study. The objectives of the study were explained and confidentiality was assured through an anonymous, SAQ. Students were seated at a distance from each other while answering the questionnaire, and teachers were requested to be away from the classroom.

Following data entry, the frequency distributions of each variable were examined and incompatible entries were identified and corrected by referring to the original questionnaire, and then analysis was carried out using the software package SPSS—Statistical Package for Social Sciences (Version 16). Unmatched case–control analysis was performed to identify correlates of peer violence. Study and control populations from the cross-sectional study were defined after the data analysis of their participatory roles in violence ("mixed perpetrator–victims" were defined as cases and "uninvolved" as controls). Correlates were determined for both physical violence and relational violence. The sample size (n = 207) was calculated for unmatched case–control analysis (1 case: 1 control) based on estimates of odds ratios available in studies conducted in the local setting (Fernandopulle, 2000; Hewamalage, 2010). For each analysis, the same number of cases was randomly selected (using a computer-generated random number table) from the "mixed perpetrator–victim group" as the number of controls (i.e., "uninvolved"—individuals who did not involve in any type of violence). To determine correlates of physical violence, cases were randomly selected among the "mixed perpetrator–victims" of physical violence, and to determine correlates for relational violence, cases were randomly selected among the "mixed perpetrator–victims" of relational violence.

Dependent Variable

Peer violence was measured separately as physical and relational violence. For each type of peer violence, participation in violence was dichotomized: "Mixed perpetrator–victims of physical violence" was coded as "1" and "uninvolved" was coded as "0." Similarly, "mixed perpetrator–victims of relational violence" was coded as "1" and "uninvolved" was coded as "0."

Independent Variables

All independent variables were included as categorical variables in the analyses. For originally continuous variables for which higher values were expected to be associated with higher risk, higher risk was coded as "1," if the value was above the 75th percentile and "0" otherwise. For originally continuous variables for which lower values are associated with higher risk, higher risk was coded as "1," if the value was below the 25th percentile and "0"otherwise.

Identification of correlates was done by performing bivariate analyses followed by multivariable analyses. Models were developed separately to determine adjusted odds ratios for physical and relational violence. Independent variables were included in the multivariable models if they had a probability value of less than .05 in the bivariate analysis. An Omnibus test was used to test the statistical significance of the overall model. (A p value of .05 or less indicates that the model fits the data adequately.) The Hosmer and Lemeshow test was used to examine the prediction capacity of the residuals of the model (Hosmer & Lemeshow, 2000).

Results

Of the eligible sample of 1,751 adolescents, 1,700 responded to the questionnaire giving a response rate of 97%. The remaining 51 (3%) refused. Table 1 shows the basic sociodemographic characteristics of the study sample.

Each of the three age groups comprised approximately one third of the study sample, and 52% were males. The large majority were Sinhalese (95.0%), Buddhists (90%), and from rural settings (66.9%). The study sample (n = 1,700) was categorized into four groups (pure victims, pure perpetrators, mixed perpetrator–victims, and uninvolved) according to adolescents' participatory role in peer violence (Table 2).

The majority, 1,101 (64.8%) of the adolescents, were "mixed perpetrator–victims of violence" and 224 (13.2%) had not been involved in any violence. Furthermore, detailed analyses of violent acts experienced and/or committed by each group revealed that "pure victims" and "pure perpetrators" were often involved in less severe forms of violence. Thus, "mixed perpetrator–victims" was considered as the most appropriate group in which to identify factors associated with peer violence.

Even though the calculated sample size for unmatched case–control analysis was 207, to include all adolescents who were not involved in violence in the control group the sample size was considered as 224. For each unmatched case–control analysis, a random sample with the required number (n = 224) was selected from the eligible study units (mixed perpetrator–victims) using a computer-generated random number table.

The list of significant correlates of physical violence identified in bivariate analyses is shown in Appendix A.

Table 1. Distribution of Basic Sociodemographic Characteristics of Study Sample.

Sociodemographic characteristics	Number (total = 1,700)	%
Age in completed years		
13	565	33.3
14	577	33.9
15	558	32.8
Sex		
Male	884	52.0
Female	816	48.0
Ethnicity		
Sinhala	1,615	95.0
Tamil	46	2.7
Muslim	27	1.6
Malay	7	0.4
Burgher	5	0.3
Religion		
Buddhism	1,530	90.0
Christianity	54	3.2
Catholicism	48	2.8
Hinduism	34	2.0
Islam	34	2.0
Residence		
Rural	1,138	66.9
Urban	562	33.1

Table 2. Distribution of the Study Sample by Participatory Role in Any Violence.

	Violence perpetration		
Violence victimization	Yes	No	Total
Yes	Mixed perpetrator–victim 1,101 (64.8%)	Pure victim 346 (20.4%)	1,447 (85.1%)
No	Pure perpetrator 29 (1.7%)	Uninvolved 224 (13.2%)	253 (14.9%)
Total	1,130 (66.5%)	570 (33.5%)	1,700 (100.0%)

Table 3 shows the correlates of physical violence that were found to be significant in the multivariable logistic regression model.

As shown in Table 3, being 13 years old (compared with 15 years) was the strongest correlate of physical violence in the multivariable regression model. Being a male was the second strongest correlate of physical violence. Presence of mental health difficulties and being 14 years old were additional individual-level correlates of physical violence.

Three family and two peer relationship correlates were associated with physical violence. Mother in foreign employment for more than 6 months at any time in the adolescent's life was the strongest family correlate of physical violence. Poor adolescent–parent interaction (parent or guardian spending less than 1 hr to socialize with the adolescent during a usual school day), and using alcohol more than 3 times during week days by parents or guardians were other family-level correlates for physical violence. Having aggressive friends and having ever been engaged in dating relationship(s) were the peer relationship correlates of physical violence in the final model.

Table 3. Correlates of Physical Violence Among Adolescents (Multivariable Logistic Regression).

Variable	OR (95% CI)
Individual level	
Age 13 years	24.9 [8.8, 70.7]
Male sex	11.2 [5.0, 24.9]
Mental health difficulties	8.6 [4.1, 18]
Age 14 years	6. 0 [2.6, 15.3]
Family and peer relationships	
Mother in foreign employment	5.7 [1.4, 23.4]
Poor parent–adolescent interaction	3.3 [1.2, 9.1]
Alcoholism among parents/guardians	2.8 [1.1, 7.2]
Aggressive friends	2.7 [1.1, 7.3]
Dating relationship(s)	2.3 [1.1, 5.1]
Community and school-related	
Witnessing physical fights among neighbors	8.3 [2.3, 29.8]
Crime-dense residence	4.9 [2, 12.4]
School absenteeism (>20%)	4.0 [1.6, 9.9]
Societal	
Watching ≥3 movies for a week	3.5 [1.5, 8.3]
Preference for action movies	3.0 [1.3, 6.7]

Note. OR = odds ratio; CI = confidence interval.

Two community correlates were significantly associated with physical violence. These were witnessing physical fights among neighbors and occurrence of crimes in the area of residence. More than 20% school absenteeism was a school-related correlate of physical violence. The two societal risk factors of physical violence were watching three or more movies per week during the school term and preference for action movies.

The Omnibus test for the overall physical violence model was statistically significant at $p < .001$. The chi-square value of the residuals of the final model was 3.650 with a p value of .887. This indicates that the independent variables in the final model explained the dependent variable in a statistically significant manner. The final model had a pseudo-Nagelkerke's R^2 of .751, which indicates that it explained 75.1% of the variance in physical violence in this sample.

The list of significant correlates of relational violence identified in bivariate analyses is shown in Appendix B. The correlates which became significant in the multivariable analysis are shown in Table 4.

Table 4. Correlates of Relational Violence Among Adolescents (Multivariable Analysis).

Variable	OR (95% CI)
Individual level	
Mental health difficulties	6.1 [3.0, 12.4]
Age 13 years	4.1 [1.9, 8.9]
Male sex	2.9 [1.6, 5.2]
Low self-esteem	2.6 [1.1, 6.9]
Family and peer relationship	
Poor family support	3.8 [2, 7.3]
Corporal punishment by parents/guardians	2.6 [1.4, 4.9]
Dating relationship(s)	2.1 [1.1, 4.3]
Community and school-related	
School absenteeism (>20%)	6.9 [3.3, 14.7]
Witnessing physical fights among neighbors	4.0 [1.3, 12.3]
Residence in crime-dense area	3.0 [1.3, 7.1]
Poor school performance	2.7 [1.2, 6.1]
Societal	
Using Internet >2 hr/day	3.2 [1. 1, 9.7]

Note. OR = odds ratio; CI = confidence interval.

As shown in Table 4, 12 variables were significantly associated with relational violence in the multivariable logistic regression model. Of these, four were individual-level correlates of relational violence. Having mental health difficulties was the strongest individual correlate. Being in the youngest age group (13-year-olds compared with 15-year-olds), male sex, and low self-esteem were other individual correlates of relational violence. Perceived low level of family support to relieve worries and corporal punishment by parents or guardians were the family relationship correlates and having ever been engaged in dating relationship(s) was the only peer relationship correlate of relational violence. More than 20% school absenteeism and poor school performance were school-related correlates and witnessing physical fights among neighbors and occurrence of crimes in the area of residence were community correlates associated with relational violence. Using the Internet more than 2 hr during a usual school day was the only societal correlate of relational violence.

The Omnibus test for the overall model was statistically significant at $p < .001$. The Hosmer and Lemeshow test had a p value more than .05.The final model had a pseudo-Nagelkerke's R^2 of .666, which reflects that the model explained 66.6% of the variance in relational violence.

Discussion

Most of the abusive behaviors identified among adolescents in Sri Lanka were included in the SLETVI to capture a wide range of peer violence among 13- to 15-year-old adolescents in schools. Even though some of these abusive acts may not be considered as "violence" in the criminological literature, we decided to include even minor forms of abusive behaviors as the primary purpose of this study was to make recommendations to prevent violence among adolescents in schools. The ecological model developed by Bronfenbrenner (1979) was used to describe the multifactorial origin of physical and relational peer violence, and we assessed correlates at four levels: individual, family and peer relationships, community/school, and societal (Figure 1). The multivariable models predicted 75% and 67% of the variance in physical and relational violence, respectively, indicating that the most important factors determining perpetration and victimization of peer violence have been identified in the present study.

The use of "mixed perpetrator–victims" group to identify correlates of peer violence was considered as the most appropriate approach, as a large majority of the study participants was categorized in this group and "mixed perpetrator–victims" were involved in more severe forms of violence compared with "pure victims" and "pure perpetrators." Therefore, the use of a mixed perpetrator–victim group as cases enabled identification of correlates of more severe forms of peer violence. This could be due to the fact that adolescents are more likely to react to severe forms of violence to defend themselves; thereby, victims of severe forms of violence may easily become perpetrators. As the power differential between peers is low, the same individual could become the perpetrator as well as the victim of violence, and this could become a vicious cycle.

Individual-Level Correlates

Male sex was identified as a predictor of both physical and relational violence. There is consistent evidence in the literature to support male predominance in physical violence. The National Survey ($n = 29,911$) on Emerging issues among 10- to 19-year-old adolescents in Sri Lanka revealed that victimization to formal forms of physical harassments was more common among males (UNICEF, 2004). Two additional local studies (Hewamalage, 2010; Wijesekera, 2003) and studies from other countries (Kaufman et al., 2000; Khoury-Kassabri, Astor, & Benbenishty, 2008; Kingery, Coggeshall, & Alford, 1998) have confirmed the higher involvement of males in physical violence.

Compared with 15-year-olds, *13-year-olds* had increased risk of having been involved in physical and relational violence in the past 6 months. Being *14 years of age* was a correlate of physical violence only. These findings are similar to both Sri Lankan (UNICEF, 2004; Wijesekera, 2003) and other international (Hill & Drolet, 1999; Kaufman et al., 2000; Kingery et al., 1998) studies that have found that the prevalence of peer violence decreases with increasing age of adolescents, indicating that early teens are more commonly

involved in violent acts measured with SLETVI compared with older age groups.

Behavioral problems, cognitive disorders, anxiety, depression, and other mood disorders are common mental health problems among adolescents (Herrenkohl et al., 2000). According to the present study, the presence of *mental health difficulties* was a correlate of both physical and relational violence, indicating that violence related to mental health difficulties needs to be addressed through adolescents' violence prevention programs and other mental health programs. An association between mental health difficulties and peer violence has been found in other studies too (Dykeman, Deahlin, Doyle, & Flamer, 1996; Farrington, 1998; Olweus, 1994).

Low self-esteem was a correlate of relational violence, but it is difficult to conclude anything regarding the directionality of the relationship (Strawhacker, 2002). Some research findings suggest that bullies act violently toward others as they are suffering from low self-esteem, while others believe that perpetrators of violence have high self-esteem (Baumeister, Campbell, Krueger, & Vohs, 2003). Adolescents' self-esteem is influenced by parents, teachers, and friends. Many factors blend together and lead the adolescent to form an opinion of him or herself. This opinion could vary from day to day. Extremes in parenting may bring down adolescent self-esteem, meaning that parents who are overly permissive can hurt a teen's self-esteem, but so can parents who are particularly restrictive and non-supportive. Teachers and other significant adults can also affect a child's self-esteem by favoring certain students and by being overcritical of others. Another important influence on adolescent self-esteem is peers as it is very important to most adolescents to be accepted by other teens.

Family and Peer Relationship Correlates

As violence is a behavior learned at an early age often through early experiences with family members and peers (Pepler & Slaby, 1996), the role of "relationships" in adolescent violence cannot be undermined.

Having a *mother in foreign employment* for more than 6 months at any time during the adolescent's lifetime was a correlate of physical violence. This finding is supported by the findings of several qualitative studies conducted in Sri Lanka (Karunasekera, Kuruppuarachchi, & Gunasekera, 2000; M. A. Perera, 1997; Senaratna, 2007). Other than these, Bryant showed that in the Philippines, the children of overseas workers were more prone to delinquency, violence, drug addiction, and involvement in premarital sex (Bryant, 2005). Having a *father in foreign employment* too assessed in this study but it lost its significance in the final models of both physical and relational violence, indicating that absence of mother has more impact on adolescents' violence compared with the absence of fathers. *Parents or guardians spending less than 1 hr to socialize with adolescents* during a usual school day was associated with being involved in physical violence. Two other Sri Lankan studies too have shown that parental neglect is associated with violence among adolescents (M. A. Perera, 1997; Senaratna, 2007). Poor monitoring and supervision of children by parents was found to be a strong predictor of violence during adolescence by McCord in her study of 250 boys in Boston, Massachusetts, United States (Krug et al.,2002). *Parental alcohol intake* more than 3 times per week was another correlate of physical violence. Hewamalage (2010) also showed that parental alcohol intake and smoking/drug abuse are associated with being victims of physical violence in her research among a group of Sri Lankan adolescents. Substance abuse by parents or guardians might cause parental neglect and violence in the home.

With regard to relational violence, *corporal punishment by parents or guardians* was identified as a family correlate of relational violence. Hewamalage (2010) also found that harsh disciplinary practices of parents against an adolescent child were associated with him or her being a victim of relational violence. The present study identified perceived *poor family support* as a correlate of relational violence. Other researchers in Sri Lanka also have attempted to explore the relationship between relational violence among adolescents and parental influences. Hewamalage (2010) also found an association between "low emotional attachments to home" and being a victim of relational violence. Thornberry, Huizinga, and Loeber (1995) found that poor parental attachment between parents and adolescents was associated with increased violence among adolescents. McCord (1996) showed that violent offenders are less likely to have experienced parental affection, good discipline, and supervision than non-violent persons. Thus, adolescents who do not receive adequate family support and have limited emotional attachments to home may be having limited problem-solving skills, ultimately leading to aggression and violence.

The influence of peers and friends during adolescence is considered as an important factor in shaping interpersonal relationships. In this study, "aggressive friends" was a correlate of being involved in physical violence, which is supported by previous literature (Thornberry et al., 1995). Dating among adolescents is quite common and an accepted behavior in Western culture, and violence related to dating relationships increases as children enter into their adolescence (American Association of University Women [AAUW], 2001; Banyard & Cross, 2008). However, such relationships are not accepted in Sri Lankan schools. In the present study, ever having been engaged in *dating relationship(s)* was identified as a correlate of being involved in physical and relational violence, whereas none of the

previous studies carried out in Sri Lanka have evaluated this association. However, this factor needs to be further explored to describe how the dating relationships lead to adolescent involvement in violence in Sri Lankan context.

Community and School-Related Correlates

Witnessing physical fights among neighbors was a correlate of both physical and relational violence. Farrington (1998) has described that adolescents living in neighborhoods with high levels of crime are more likely to be involved in violent behavior than those living in other neighborhoods. Witnessing violence and conflicts seems to be a factor in inducing violent behavior among adolescents. Adolescents learn that violence, rather than communication or negotiation, is an appropriate way to solve interpersonal problems or manage anger (Thornberry et al., 1995). *Crime-dense area of residence* was another correlate of both physical and relational violence. Crime-dense neighborhoods could be associated with contextual factors such as the presence of gangs and the availability of drugs and weapons (Howell, 1997).

School absenteeism was also identified as a school-related correlate of physical and relational violence. The lack of available information on the temporal relationship between violence and school absenteeism precludes any causal inference to be drawn about the relationship between absenteeism and physical or relational violence. Absence from school could be a consequence of peer violence. In 2005, 6% of U.S. high school students participating in a nationwide survey reported that they did not go to school on one or more of the previous 30 days because they were concerned about their security (Centers for Disease Control and Prevention [CDC], 2006). Violence among adolescents in schools has been shown to disrupt the learning process of both victims and perpetrators and has a negative effect on education (Agnich, 2011; Howell, 2008). The present study identified *poor school performance* as a correlate of relational violence. Academically and socially unsuccessful students may particularly be at risk for having violent behaviors (Felson, Liska, South, & McNulty, 1994; Gorski & Pilotto, 1993; Herrenkohl et al., 2000).

Societal Correlates

Watching ≥3 movies per week during the school term and *preference for action movies* were correlates of physical violence. Findings from experimental studies show that brief exposure to violence on television or film, particularly dramatic presentations of violence, produces short-term increases in aggressive behavior (Krug et al.,2002). However, effects of media violence on more serious forms of violent behavior such as assault and homicide have been found to be small (Paik & Comstock, 1994). *Using Internet for more than 2 hr during a usual school day* was a correlate for relational violence. According to a study looked at the online experiences of 432 students in Grades 7 to 9 in Canada, increasing access to new technology has increased students' social interactions and enhanced collaborative learning experiences (Beran & Li, 2005). However, electronic communication among adolescents has been shown to cause serious problems. One such issue is "cyber bullying," that is, the use of electronic communication devices to bully others, which has become a growing problem in schools (Beran & Li, 2005). The growing number of events and the level of severity of cyber bullying is a call for educators, researchers, administrators, and authorities to take action. Being a new territory, it is important to gain good understanding of cyber bullying to better address this problem. No researchers have examined the association between use of Internet by adolescents and their involvement in violence in Sri Lanka. The present study suggests that cyber bullying should be a concern in prevention of violence among adolescents.

Strengths and Limitations of the Study

The sample for these analyses was selected randomly from the large school-based sample. This sample is representative of all four educational divisions in Gampaha district. The non-response rate was only 3%.

Sixty-five variables, which were identified as operating at individual, family/peer relationship, community and societal level, were assessed in this study. The multivariable models developed for physical and relational violence were able to predict a substantial proportion of the variance of physical and relational violence, indicating that the most important factors determining perpetration and victimization of peer violence have been identified in the present study. Most of the identified factors are modifiable, and could be addressed via interventions.

The limitations of this study should also be noted. The cross-sectional methodology does not allow for strong conclusions to be drawn regarding the temporal relationship between the factors considered and the violent behaviors. The study was carried out in the district of Gampaha and findings should be cautiously generalized to the rest of Sri Lanka. The association of some factors such as ethnicity and religion with peer violence could not be assessed in the present study because the sample was not adequately representative of minor ethnic and religious groups.

Conclusion

Factors associated with physical and relational violence among adolescents occurred at the different levels described in Bronfenbrenner's social-ecological model, including individual, family/peer relationship, community and societal

levels. Being 13 years old, male sex, having mental health difficulties, dating relationship(s), school absenteeism, witnessing physical fights among neighbors, and living in crime-dense neighborhoods were correlates of both physical and relational violence. Being 14 years old, having a mother in foreign employment, poor parent–adolescent interaction, alcohol consumption by parents or guardians, aggressive friends, watching three or more movies per week during the school term, and preference for action movies were correlates only of physical violence. Low self-esteem, poor school performance, perceived poor family support, corporal punishments by parents/guardians, and using Internet > 2 hr/day were correlates only of relational violence. Thus, the study findings indicate that micro-, meso-, and macro-systems should be important targets for violence prevention among adolescents, and that interventions should involve multiple stakeholders.

Recommendations

Findings from this study suggest that certain environmental factors may have an equal or greater effect on violence than individual-level factors. A more comprehensive school-based prevention program, including both primordial and primary preventive strategies, needs to be designed, taking into account the modifiable individual, relationship, community and societal factors that were found to be associated with peer violence.

The general public, including parents, guardians, and teachers, should be educated on the family, community, and societal correlates of peer violence among adolescents to promote their support to address this important issue. Peer violence intervention programs need to target parenting behavior and practices. Parents should interact with adolescents every day, and mothers should think twice before leaving their children for foreign employments. The social structure which compels parents, especially mothers, leaving their children for foreign employment, could be improved by increasing local employment opportunities for women and making policy decisions to reduce long work hours, thus allowing parents to have more interactions with their children. Adolescents should be supervised by parents to limit Internet use and movie watching. Harmful alcohol consumption among parents/society needs to be discouraged. Parent education, family therapy, and psycho-dynamic art therapy could be used at the family level to prevent and reduce violence among adolescent peers. Introduction of legislation to ban corporal punishment by parents would likely also be beneficial (Hong, Lee, Lee, Lee, & Garbarino, 2013).

Furthermore, health sector involvement is pertinent in designing a violence prevention program as violence is related to mental health among the students. The existing health care system could be utilized for this purpose; for example, adolescents could be screened for mental health problems by the primary health care team during the school health inspection. Teacher and parental support is also recommended to identify mental health problems among adolescents. In addition, school-based counseling programs designed to address violence should be established. The psychosocial environment of the school should also be monitored and programs should be developed to promote adolescents' mental health. School-based life skill programs may be implemented to help adolescents build good self-esteem, achieve effective communication skills, and develop stress coping/anger management strategies.

School policies and practices should advance relations between students and between students and teachers that are respectful, non-abusive, and non-discriminatory. In instances of abuse, violence, harassment, or discrimination among students or between staff and students, this should be condemned openly to promote appropriate social norms. Specifically, there should be a school policy to ban physical punishment by teachers to discipline adolescents. Discipline does not derive from rules, punishments, and external control. It is more effectively learned from reinforcement and through experiencing consequences, which are fair, firm, and clearly communicated (Harber, C. 1997).

Programs should be implemented to decrease the occurrence of neighborhood violence and crimes. The media should be more responsible and avoid promoting violence among adolescents, and policy decisions should be taken to control presentation of violence through the media. Broadcasting companies should be encouraged to avoid showing violent programs early in the evening, and they could provide clear advice on how old teenagers should be to watch specific program, for example, minimum age 18 years.

In conclusion, although there are a multitude of factors that contribute to peer violence in schools, most of the factors identified in this study are potentially modifiable. Factors such as corporal punishment, exposure to violence through the media, watching movies, and/or Internet use for long hours could be modified in the short term, whereas others, such as values and socioeconomic conditions, will take longer time to change.

Appendix A

List of Significant Correlates of Physical Violence Identified in Bivariate Analyses

No.	Variable	OR	95% CI	*p* value
A	Individual-level correlates			
1	Smoking at the time of survey	16.5	[3.9, 70.1]	<.001
2	Presence of symptoms of mental health problem	14.9	[8.9, 25.2]	<.001
3	Male, sex	12.1	[7.6, 19.4]	<.001
4	Using alcohol at time of survey	12.1	[2.8, 52.1]	.001
5	Using mood altering drugs at time of survey	10.3	[2.4, 44.7]	.002
6	Low self-esteem	5.4	[2.9, 10.2]	<.001
7	Being a victim to sexual abuse (ever in lifetime)	5.1	[2.9, 9.0]	<.001
8	Age—13 completed years	4.9	[2.9, 8.1]	<.001
9	Age—14 completed years	2.1	[1.4, 3.3]	.001
B	Family and peer relationship correlates			
10	Ever been engaged in dating relationships(s)	5.6	[3.6, 8.7]	<.001
11	Conflicts between family members and neighbors	5.3	[1.5, 18.5]	.009
12	Weapon availability at home	5.1	[2.8, 9.5]	<.001
13	Having aggressive friends	5.0	[2.7, 9.1]	<.001
14	Corporal punishments by parents/guardians	4.8	[2.9, 7.9]	<.001
15	Perceived level of fulfilling requirements of educational material by parents/guardians	4.1	[2.3, 7.3]	<0.001
16	Low level of perceived parental/family support to relieve worries	3.7	[2.4, 5.8]	<.001
17	Perceived low level of appraisal of educational or other achievements by family members	3.6	[1.9, 7.0]	<.001
18	Less than 1 hr spent to socialize with adolescent by parents/guardians for usual school day	3.5	[1.8, 6.5]	<.001
19	Verbal abuse by parents/guardians	3.3	[2.1, 5.2]	<.001
20	Perceived low level of love and affection by parents/family members	3.2	[1.9, 5.5]	<.001
21	Mother in foreign employment for more than 6 months ever in adolescent's lifetime	3.2	[1.7, 6.1]	<.001
22	Having friends who frequently run away from school	2.9	[1.5, 5.9]	.002
23	Taking alcohol by parents/guardians. (>3 times per week)	2.8	[1.7, 4.7]	<.001
24	Mother usually stay away from home	2.7	[1.2, 6.1]	.013
25	Single-parent family	2.5	[1.1, 5.5]	.027
26	Father in foreign employment for more than 6 months ever in adolescent's lifetime	2.4	[1.4, 4.1]	.002
27	Conflicts among parents/family members	2.3	[1.2, 4.4]	.008
28	Father usually stay away from home	2.3	[1.3, 4.0]	.003
29	Fights with siblings	2.2	[1.5, 3.4]	<.001
30	Father's low level of education	1.9	[1.1, 3.2]	.02
31	Mother employed (at time of survey)	1.6	[1.1, 2.5]	.026
C	Community and school-related correlates			
32	More than 20% of school absenteeism	7.5	[4.6, 12.3]	<.001
33	Existence of a place where students could buy or get mood altering drugs in neighborhood	7.3	[3.6, 14.7]	<.001
34	Poor school performance	7.1	[4.1, 12.4]	<.001
35	Existence of a place where students could watch blue-films	6.9	[3.7, 13.0]	<.001
36	Availability of weapons in the area of residence	6.1	[3.6, 10.4]	<.001
37	Existence of a place where students could buy or get cigarettes in the school neighborhood	6.0	[3.3, 11.1]	<.001
38	Being a member of such gang	5.8	[2.4, 14.3]	<.001
39	Ever carrying weapons to school	5.4	[2.5, 11.9]	<.001
40	Occurrence of crimes in the area of residence	5.3	[3.3, 8.4]	<.001
41	Witnessing physical fights among neighbors	4.8	[2.2, 10.7]	<.001
42	Verbal abuse by school teachers/principal	4.7	[2.8, 7.8]	<.001
43	Existence of a place where students could buy or get alcohol in the school neighborhood	4.3	[2.2, 8.7]	<.001
44	Presence of gangs in the area of residence	4.1	[2.8, 6.2]	<.001
45	Corporal punishment by school teachers/principal	3.6	[2.3, 5.6]	<.001
46	Witnessing destruction of properties by neighbors	3.4	[1.6, 7.2]	.001
47	Witnessing verbal aggression among neighbors	3.1	[1.8, 5.6]	<.001
48	Being a member of a sport team (at time of survey)	2.3	[1.5, 3.3]	<.001
D	Societal correlates			
49	Watching three or more movies (per week during school term)	6.7	[3.7, 12.2]	<.001
50	Internet use for more than 2 hr duration during a school day	5.2	[2.6, 10.7]	<.001
51	Preference for action movies	4.1	[2.5, 6.6]	<.001
52	Access to Internet	2.1	[1.4, 3.1]	<.001
53	Duration of watching TV 2 hr or more during a school day	2.0	[1.3, 3.1]	.001
54	Preference for adventurous movies	2.0	[1.3, 3.1]	.003
55	Access to mobile phones	1.9	[1.3, 2.8]	.001

Note. OR = odds ratio; CI = confidence interval.

Appendix B

List of Significant Correlates of Relational Violence Identified in Bivariate Analyses

No.	Variable	OR	95% CI	*p* value
A	Individual-level correlates			
1	Presence of symptoms of mental health problem	11.4	[6.8, 19.1]	<.001
2	Smoking at the time of survey	11.4	[6.8, 19.1]	<.001
6	Using alcohol at the time of survey	5.7	[1.3, 26.2]	.024
7	Currently using mood altering drugs	5.2	[1.1, 24.0]	.035
8	Low self-esteem	4.6	[2.4, 8.7]	<.001
9	Male sex	4.5	[3.0, 6.7]	<.001
10	Being a victim to sexual abuse (ever in lifetime)	4.2	[2.3, 7.4]	<.001
12	Age—13 completed years	3.7	[2.2, 6.2]	<.001
13	Age—14 completed years	1.7	[1.1, 2.7]	<.001
B	Family and peer relationship correlates			
14	Poor family support to relieve worries	4.6	[3.0, 7.1]	.001
15	Witnessing conflicts between family members and neighbors	4.2	[1.2, 15.0]	.029
16	Having ever being engaged in dating relationship(s)	3.9	[2.5, 6.1]	<.001
17	Corporal punishments by parents/guardians	3.9	[2.3, 6.5]	<.001
18	Having aggressive friends	3.6	[2.0, 6.7]	<.001
19	Weapon availability at home	3.5	[1.8, 6.5]	<.001
20	Perceived low level of fulfilling requirements of educational material by parents/guardians	3.3	[1.8, 6.0]	<.001
21	Less than 1 hr spent to socialize with adolescent by parents/guardians for a usual school day	2.9	[1.5, 5.5]	.001
22	Verbal abuse by parents/guardians	2.7	[1.7, 4.4]	<.001
23	Single-parent family	2.6	[1.2, 5.8]	.019
24	Mother usually stay away from home	2.6	[1.2, 5.8]	.019
25	Perceived low level of appraisal of educational or other achievements by family members	2.6	[1.3, 5.1]	.005
26	Fights with siblings	2.6	[1.8, 4.0]	<.001
27	Taking alcohol by parents/guardians (>3 times per week)	2.6	[1.5, 4.4]	<.001
28	Mother in foreign employment for more than 6 months ever in adolescent's lifetime	2.4	[1.2, 4.6]	.01
29	Witnessing conflicts among parents/family members	2.3	[1.2, 4.2]	.012
30	Father in foreign employment for more than 6 months ever in adolescent's lifetime	2.2	[1.1, 3.8]	.012
31	Perceived low level of love and affection by parents/family members	2.2	[1.2, 3.8]	.007
32	Father's low level of education	2.1	[1.3, 3.5]	.003
33	Mother employed	1.5	[1.0, 2.3]	.047
C	Community and school-related correlates			
34	School absenteeism (>20%)	7.8	[4.7, 12.8]	<.001
35	Poor school performance	6.9	[4.0, 12.0]	<.001
36	Existence of a place where students could buy or get mood altering drugs in neighborhood	5.2	[2.6, 10.7]	<.001
37	Existence of a place where students could watch blue-films	4.9	[2.6, 9.3]	<.001
38	Residence in crime-dense area	4.7	[2.9, 7.5]	<.001
39	Witnessing physical fights among neighbors	4.5	[2.0, 10.0]	<.001
40	Availability of weapons in the area of residence	4.4	[2.5, 7.5]	<.001
41	Verbal abuse by school teachers/principal	4.4	[2.6, 7.4]	<.001
42	Existence of a place where students could buy or get cigarettes in the school neighborhood	4.4	[2.4, 8.3]	<.001
43	Presence of gangs in the area of residence	3.7	[2.5, 5.5]	<.001
44	Corporal punishment by school teachers/principal	3.3	[2.1, 5.1]	<.001
45	Ever carrying weapons to school	2.8	[1.2, 6.5]	.016
46	Existence of a place where students could buy or get alcohol in the school neighborhood	2.7	[1.3, 5.5]	.009
47	Witnessing verbal aggression among neighbors	2.5	[1.4, 4.5]	.002
48	Being a member of a sport team (currently)	1.7	[1.2, 2.6]	.006
D	Societal correlates			
49	Watching ≥3 movies for a week (per week during school term)	4.6	[2.5, 8.5]	<.001
50	Using Internet >2 hr/day	4.5	[2.2, 9.3]	<.001
51	Preference for action movies	3.5	[2.2, 5.8]	<.001
52	Duration of watching TV more than 2 hr during a school day	1.9	[1.3, 2.9]	.002
53	Access to mobile phones	1.8	[1.3, 2.6]	.002
54	Preference for adventurous movies	1.7	[1.1, 2.8]	.02
55	Access to Internet	1.6	[1.1, 2.3]	.028

Note. OR = odds ratio; CI = confidence interval.

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