

Violence among schoolchildren in Alexandria

R.M. Youssef,¹ M.S. Attia² and M.I. Kamel¹

العنف بين التلاميذ في الإسكندرية

راندا محمود يوسف ومدحت صلاح عطية ومحمد إبراهيم كامل

خلاصة: قمنا ببحث سلوكيات العنف بين تلاميذ المدارس وعوامل التكهن بها. فطلبنا من 2170 تلميذاً مختاراً أن يجيبوا على أسئلة استبيان وُزِعَ عليهم. فأفاد 51.0% من الذكور و20.9% من الإناث بأنهم كانوا البادئين بالعدوان خلال الشهور الثمانية عشرة السابقة على الدراسة. وأشار تحليل الانحدار اللوجستي متعدد المتغيرات إلى 16 من متغيرات التكهن بالسلوكيات العنيفة. فكان بعضها يتعلق بالخلفية العائلية، بينما كان معظمها يتعلق بالأطفال أنفسهم. إن الاعتداءات كانت على الأرجح تبدأ من قِبَل الذكور، وأولئك الذين يُتسمون بالجرأة وحب المخاطرة. وكثيراً ما دخلوا في معارك كلامية أو هددوا بمهاجمة الآخرين، أو عاملوا الحيوانات بقسوة أو أثاروا الفوضى في قاعات الدراسة أو هجروا مدارسهم أو بيوتهم. كما أنهم سبق أن عوقبوا بعقوبات بدنية من قِبَل والديهم أو معلمهم. إن الأمر يتطلب النظر في تنظيم برامج وقائية وتدخّلية في المدارس تتناول عوامل التكهن القابلة للتغيير.

ABSTRACT Violent behaviour among school students and its predictors were investigated. Selected children (2170) were requested to complete a self-administered questionnaire. Initiating violent assaults in the 18 months prior to the study was reported by 51.0% of boys and 20.9% of girls. Multivariate logistic regression analysis pointed to 16 predictive variables for violent behaviour; few were related to family background whereas the majority were related to the children themselves. Violent assaults were more likely to be initiated by boys and those who were dangerously daring and risk-takers, often fought verbally, threatened to attack others, were cruel to animals, disrupted class discipline, were truant from school or ran away from home and were disciplined by corporal punishment by their parents and their teachers. School-based prevention and intervention programmes addressing modifiable predictors should be considered.

La violence chez les écoliers à Alexandrie

RESUME Le comportement violent chez les écoliers et ses facteurs prédictifs ont été examinés. Il a été demandé à certains enfants (2170) de remplir un questionnaire. Cinquante et un pour cent des garçons (51.0%) et 20.9% des filles ont déclaré avoir commis des actes violents dans les 18 mois précédant l'étude. L'analyse de régression logistique à variables multiples a indiqué 16 variables prédictives pour le comportement violent; quelques-unes de ces variables seulement étaient liées au milieu familial tandis que la majorité étaient liées aux enfants eux-mêmes. Les attaques violentes étaient plus fréquemment commises par les garçons et ceux qui sont audacieux et prennent des risques, avaient souvent des disputes verbales, menaçaient d'agresser les autres, étaient cruels envers les animaux, perturbaient la discipline de la classe, faisaient l'école buissonnière ou s'enfuyaient de la maison et étaient disciplinés par les parents et les enseignants au moyen des châtiments corporels. Des programmes scolaires de prévention et d'intervention prenant en compte les facteurs modifiables devraient être envisagés.

¹Public Health Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt.

²High Institute of Public Health, Alexandria University, Alexandria, Egypt.

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Introduction

In European and North American societies, the problem of youth violence is a cause of great concern [1]. It has been recognized as a major public health problem requiring the effort of health care professionals rather than a social problem to be dealt with, primarily, by law enforcement and judicial systems [2]. Physical fighting is a common form of interpersonal violence among adolescents and a prominent cause of injury and homicide in this age group [3], which contributes substantially to years of potential life lost [4].

In the Alexandria Students' Hospital, 4.4% of the students attending the emergency department were seeking medical care for injuries resulting from physical fighting (MI Kamel et al. unpublished finding, 1998). This figure, since obtained from a single specialized facility, reflects only incidents that resulted in a serious outcome. It is assumed that many more incidents involving school students take place which may not result in any injury or may result in only minor injuries. Indeed, violence stems from a large number of personal [1,5-7] and environmental factors [4,8-10]. Accordingly, this study was undertaken to find out the extent of violent behaviour adopted by preparatory and secondary school students and its predictors.

Methods

Study design and sampling technique

A cross-sectional survey was carried out targeting preparatory and secondary school students enrolled in the mainstream governmental schools in Alexandria. All educational zones were represented. The

multistage random sample technique was used to select two schools, one preparatory and the other secondary from each educational zone, yielding a total of 14 schools. The total number of students to be selected was estimated using the following equation: $n = (Z^2 \times p \times q) / D^2$. Since the actual prevalence of the condition under study is unknown, the probability of its occurrence was estimated to be equal to that of its non-occurrence ($p = q = 0.50$) and a value of 0.02 was chosen as the acceptable limit of precision (D). Based on these assumptions, the sample size was estimated to be 2401 students.

Prior communication with the local Directorate of Education revealed that, in preparatory and secondary schools, the average number of students was 55 per class. Accordingly, to reach the desired sample size, a total of 43.65 classes were to be selected. This number was rounded to the nearest figure to be divided by the chosen number of schools ($n = 14$). Hence, from each school, three classes were randomly selected, one of each grade, to allow the representation of all age groups. Owing to the variability in the number of students per class and the high rate of absenteeism encountered in some schools, a total sample of 2170 students was reached.

Data collection

In coordination with the school authority, the investigator spent 45 minutes in each class. Students were briefed about the purpose of the study, encouraged to participate and motivated to express their experiences. It was emphasized that all information collected was strictly confidential. Students were requested to complete the self-administered questionnaire to reveal their personal characteristics, family background, behavioural patterns, the initiation of physical assaults against others in the previous

18 months as well as the means of discipline adopted by their parents at home and their teachers in school.

Operational definitions of terms adopted were:

- Violent behaviour was defined as an act of physical force that tended to inflict harm or cause bodily injury.
- Corporal punishment was defined as hitting, belting, slapping, burning or tying used singly or in combination to discipline a child for misbehaviour whether or not these means led to physical injuries and whether or not it necessitated medical care.

Statistical analysis

Data were analysed using *SPSS* (version 7.5) and the *Epi-Info* (version 6.02) software. The mean, standard deviation, odds ratio (OR) and the corresponding 95% confidence interval (CI) were computed. The chi-squared test was used as the test of significance. This was in addition to univariate and multivariate logistic regression analyses. The latter was used to model the adoption of violent behaviour as a function of the children's family background, characteristics, behaviour as well as the corporal punishment to which they were subjected at home or school. The 5% level was chosen as the level of significance.

Results

Just over half of selected children (53.5%) were preparatory school pupils while the rest were in secondary school, with a preponderance of boys (61.4%) over girls. Their ages ranged from 10.5 years to 20 years (mean 14.58 ± 1.74 years). The children came from families with an average

family size of 6 persons (5.9 ± 1.89 persons). The number of offspring in each family varied between 1 and 19 (4.2 ± 1.91 children per family). The number of rooms occupied by their families ranged from 1 to 14 (3.7 ± 1.35) with a mean crowding index of 1.87 ± 1.14 persons per room (minimum = 0.33; maximum = 12.00).

About half of the boys enrolled (51.0%) and only 20.9% of the girls reported the initiation of violent assaults. The vast majority of these assaults were with bare hands, here with a preponderance among girls (93.7%) over boys (82.35%) ($\chi^2_1 = 13.85$, $P = 0.00019$). On the other hand, assaults initiated with sticks, thrown stones or sharp tools were found more frequently among boys. Hitting the victim with a belt was reported by boys in 0.29% of the instances, while one girl reported the use of a slipper (0.57%) (Table 1).

A significantly higher percentage of boys reported injuring their victims ($\chi^2_1 = 51.29$, $P = 0.00000$). The assaults most frequently ended by inflicting a wound on the victim, followed by causing bumps or contusions then fractures. More serious sequelae of violent behaviour were only reported by boys, such as loss of consciousness (1.61%) and concussion (0.80%). The majority of girls' victims (66.67%) did not seek medical care for their injuries. Although a small proportion of boys' victims (15.67%) sought medical care, in 43.37% of the assaults, the victims were never seen thereafter and the assaulters did not know whether or not their victims sought such care (Table 1).

Violent behaviour was significantly associated with the students' gender ($\chi^2_1 = 195.16$, $P = 0.00000$) and their educational stage ($\chi^2_1 = 28.82$, $P = 0.0000$). A significantly higher tendency to interpersonal violence was encountered among boys (OR =

Table 1 Violent behaviour adopted by children studied and its sequelae

Violent behaviour and its sequelae	Male (n = 1333)		Female (n = 837)		χ^2_1
	No.	%	No.	%	
<i>Initiation of violent assaults</i>					
No	653	48.99	662	79.09	
Yes ^a	680	51.01	175	20.91	
Hands	560	82.35	164	93.71	13.85 (P = 0.00019)
Stick	99	14.56	10	5.71	9.79 (P = 0.00175)
Throwing stones	94	13.82	3	1.71	20.29 (P = 0.00000)
Sharp tools	47	6.91	1	0.57	10.56 (P = 0.00115)
Belt	2	0.29	–	–	P = 1.0000 ^b
Slipper	–	–	1	0.57	P = 0.20467 ^b
<i>Injuries inflicted on the victim</i>					
	(n = 680)		(n = 175)		
No	431	63.38	160	91.43	51.29 (P = 0.00000)
Yes ^a	249	36.62	15	8.57	
Bumps and contusions	119	47.79	6	40.00	
Wounds	152	61.04	9	60.00	
Fractures	7	2.81	1	6.66	
Loss of consciousness	4	1.61	–	–	
Concussion	2	0.80	–	–	
<i>Medical care sought by the victim</i>					
	(n = 249)		(n = 15)		
No	102	40.96	10	66.67	3.83 (P = 0.05045)
Yes	39	15.67	3	20.00	P = 0.71411 ^b
Don't know	108	43.37	2	13.33	5.25 (P = 0.0219)

^aCategories are not mutually exclusive

^bP calculated from the Fisher exact test

3.94) and among preparatory school students (OR = 1.61) (Table 2). However, the risk of adopting such behaviour decreased insignificantly with the increase in the child's age (OR = 0.95; 95% CI 0.90–1.001).

Children and adolescents who reported chronic health problems, birth defects or handicapping conditions were 1.28 times more likely to initiate a physical assault, but this was not significant (OR = 1.28; 95% CI 0.96–1.70). On the other hand, a risk of 5.19 was encountered among those who smoked (OR = 5.19). Moreover, children and adolescents who stated a preference for televised violence coupled with

imitation of scenes watched were nearly 5 times more likely to initiate a physical assault (OR = 4.74) compared with those who did not have a preference for such programmes. The odds were only 1.52 times among those who reported a preference for televised violence but without imitation (Table 2).

A significant trend was observed between the level of the father's education (χ^2 of linear trend = 36.26, P = 0.00000) and the mother's education (χ^2 of linear trend = 26.95, P = 0.00000) and violent behaviour among children. Compared with children of university graduates, children born to parents who were illiterate or just able to

Table 2 General characteristics of children studied in relation to violent behaviour

General characteristic	Violent behaviour				OR (95% CI)
	Yes (n = 855)		No (n = 1315)		
	No.	%	No.	%	
<i>Educational stage</i>					
Preparatory	518	60.58	642	48.82	1.61*
Secondary	337	39.42	673	51.18	(1.35–1.92)
<i>Sex</i>					
Male	680	79.53	653	49.66	3.94*
Female	175	20.47	662	50.34	(3.22– 4.83)
<i>Chronic health problems, birth defects and handicapping conditions</i>					
Present	103	12.05	127	9.66	1.28
Absent	752	87.95	1188	90.34	(0.96–1.70)
<i>Smoking</i>					
Yes	81	9.47	29	1.98	5.19*
No	774	90.53	1289	98.02	(3.24–8.36)
<i>Preference for televised violence</i>					
No	58	6.78	169	12.85	1.00
Yes with no imitation	506	59.18	967	73.54	1.52
Yes with imitation	291	34.04	179	13.61	4.74

* statistically significant

OR = odds ratio CI = confidence interval

read and write and those who had completed their basic or high-school education were at a higher risk of adopting violent behaviour. Moreover, compared with professionals and semiprofessionals, the risk was higher among children whose fathers were classified under all other occupational categories, including pensioners; the highest risk (OR = 1.80) was among children whose fathers were unemployed at the time of the study. On the other hand, violent behaviour was less likely among children of employed mothers (OR = 0.65) (Table 3).

Family circumstances of the children and adolescents are shown in Table 3. It shows that children whose family shared a flat were at a higher risk of adopting violent behaviour compared with those whose

family lived in a separate dwelling. The risk was slightly higher among children of a family sharing a flat with strangers (OR = 1.54) than those sharing with relatives (OR = 1.37). Moreover, the risk was much higher among children whose parents smoked, consumed alcoholic beverages or used psychoactive substances (OR = 1.45). Violent behaviour also increased with the increase in family size (OR = 1.09 95% CI 1.05–1.15), number of offspring (OR = 1.10 95% CI 1.05–1.15) and crowding index (OR = 1.70 95% CI 1.08–1.26).

A linear trend was observed between violent behaviour adopted by children and adolescents and their family income (χ^2 of linear trend = 7.42, $P = 0.00642$). Compared with those who reported that their

Table 3 Family background, circumstances and structure and disruption in students studied in relation to violent behaviour

Family conditions	Violent behaviour				OR (95% CI)
	Yes (n = 855)		No (n = 1315)		
	No.	%	No.	%	
<i>Family background</i>					
Father's education					
Illiterate or read and write	271	31.70	330	25.10	1.87
Primary/preparatory	281	32.86	325	24.71	1.97
Secondary	172	20.12	361	27.45	1.09
University	131	15.32	299	22.74	1.00
Mother's education					
Illiterate or read and write	374	43.74	469	35.67	1.81
Primary/preparatory	251	29.36	347	26.39	1.64
Secondary	132	15.44	277	21.06	1.08
University	98	11.46	222	16.88	1.00
Father's occupation					
	(n = 790) ^a		(n = 1218) ^a		
Professional/semiprofessional	206	26.07	395	32.43	1.00
Skilled/semiskilled	216	27.35	291	23.89	1.42
Unskilled	135	17.09	169	13.87	1.53
Manual	44	5.57	51	4.19	1.65
Trader	78	9.87	128	10.51	1.17
Pensioner	79	10.00	150	12.32	1.01
Unemployed	32	4.05	34	2.79	1.80
Mother's working status					
	(n = 837) ^a		(n = 1292) ^a		
Employed	143	17.08	310	23.99	0.65*
Unemployed	694	82.92	982	76.01	(0.52–0.82)
<i>Family circumstances</i>					
Type of residence					
Separate flat	755	88.30	1203	91.48	1.00
Shared with relatives	69	8.07	80	6.08	1.37
Shared with strangers	31	3.63	32	2.44	1.54
Fights and quarrels between family members					
Present	356	41.64	514	39.09	1.11
Absent	499	58.36	801	60.91	(0.93–1.33)
Parental smoking, consumption of alcoholic or psychoactive substances					
Yes	494	57.78	638	48.52	1.45*
No	361	42.22	677	51.48	(1.22–1.73)
Family Income					
Just sufficient	456	53.33	813	61.82	1.00
Insufficient	262	30.64	297	22.59	1.57
Excess, allowing saving	137	16.03	205	15.59	1.19

Table 3 (Continued)

Family conditions	Violent behaviour				OR (95% CI)
	Yes (n = 855)		No (n = 1315)		
	No.	%	No.	%	
Contribution of the index child to the family income					
No	531	62.10	1070	81.37	1.00
Summer job	300	35.09	229	17.41	2.64
Year-round job	24	2.81	16	1.22	3.02
<i>Family structure and disruption</i>					
Family structure: living with:					
Both biological parents	746	87.25	1157	87.98	1.00
One parent	83	9.71	134	10.19	0.96
Step-parent	17	1.99	16	1.22	1.65
Close relatives	9	1.05	8	0.61	1.74
Family disruption					
Intact family	746	87.25	1157	87.98	1.00
Divorce or separation	21	2.46	26	1.98	1.25
Death	75	8.77	117	8.90	0.99
Father working abroad	13	1.52	15	1.14	1.34

^aExcluding those whose father or mother had died

* statistically significant

OR = odds ratio CI = confidence interval

family income was just sufficient to cover their expenses, a higher tendency to violent behaviour was encountered among children whose family income was in excess and allowed saving (OR = 1.19) and among those whose family income was not sufficient to cover their basic needs (OR = 1.57). Violent behaviour was also more likely to be adopted by children who contributed to their family income by taking a summer job (OR = 2.64) or working all the year round (OR = 3.02) compared with those who did not make such a contribution (Table 3).

Table 3 also shows the risk of adopting violent behaviour in relation to family structure and the underlying cause for family disruption. A higher risk of violent be-

haviour was observed among children living with a step-parent (OR = 1.65) or close relatives (OR = 1.74) than among those living with both biological parents; compared with the latter the risk was lower among children living in a single-parent family (OR = 0.96). A much higher risk was encountered among children whose family was disrupted by divorce or separation (OR = 1.25) and those whose fathers sought work abroad leaving the family behind (OR = 1.34). On the other hand, children who had lost a parent or both parents because of death were at a lower risk of violent behaviour than those living in intact families (OR = 0.99).

Violent behaviour was more likely to be encountered among children who reported

Table 4 Self-reported behaviour of children studied in relation to violent behaviour

Self-reported behaviour	Violent behaviour				OR (95% CI)
	Yes (n = 855)		No (n = 1315)		
	No.	%	No.	%	
<i>Have friends with whom they spend leisure time</i>					
Yes	650	76.02	926	70.42	1.33*
No	205	23.98	389	29.58	(1.09–1.63)
<i>Liked by most friends and neighbours</i>					
No	78	9.12	95	7.22	1.29
Yes	777	90.88	1220	92.78	(0.93–1.78)
<i>Dangerously daring and a risk-taker</i>					
Yes	501	58.60	563	42.81	1.89*
No	354	41.40	752	57.19	(1.58–2.26)
<i>Often tell lies</i>					
Yes	182	21.29	147	11.18	2.15*
No	673	78.71	1168	88.82	(1.68–2.74)
<i>Often destroy others' belongings</i>					
Yes	111	12.98	90	6.84	2.03*
No	744	87.02	1225	93.16	(1.50–2.75)
<i>Often fight verbally</i>					
Yes	294	34.39	120	9.13	5.22*
No	561	65.61	1195	90.87	(4.10–6.65)
<i>Often threaten to attack others physically</i>					
Yes	151	17.66	41	3.12	6.66*
No	704	82.34	1274	96.88	(4.60–9.68)
<i>Often cruel to animals</i>					
Yes	80	9.36	27	2.05	4.92*
No	775	90.64	1288	97.95	(3.09–7.88)
<i>Truant from school/runaway from home</i>					
Yes	213	24.91	105	7.98	3.82*
No	642	75.09	1210	92.02	(2.95–4.96)
<i>Disruptive in class</i>					
Yes	234	27.37	156	11.86	2.80*
No	621	72.63	1159	88.14	(2.22–3.53)
<i>Resat for an exam or repeated a grade</i>					
Yes	345	40.35	385	29.28	1.63*
No	510	59.65	930	70.72	(1.36–1.97)

* statistically significant

OR = odds ratio CI = confidence interval

Table 5 Relation between violent behaviour and being subjected to corporal punishment

Subjected to corporal punishment	Violent behaviour				OR (95% CI)
	Yes (n = 855)		No (n = 1315)		
	No.	%	No.	%	
<i>At home</i>					
Yes	474	55.44	339	25.78	3.58*
No	381	44.56	976	74.22	(2.97–4.32)
<i>At school</i>					
Yes	715	83.63	866	65.86	2.65*
No	140	16.37	449	34.14	(2.13–3.30)

* statistically significant

OR = odds ratio CI = confidence interval

being dangerously daring (OR = 1.89) and had friends with whom they spent leisure time (OR = 1.33). They were more likely to admit that they often told lies (OR = 2.15), destroyed others' belongings (OR = 2.03), often fought verbally (OR = 5.22), threatened to attack others physically (OR = 6.66) and were cruel to animals (OR = 4.92). Furthermore, they were truant from school or ran away from home (OR = 3.82), often disrupted class discipline (OR = 2.80) and were poor achievers at school, which was indicated by resitting an exam or repeating a grade (OR = 1.63) (Table 4).

Table 5 shows that the risk of violent behaviour was nearly 2.5 times higher among children and adolescents subjected to corporal punishment at school (OR = 2.65) and even higher among those who were subjected to this form of punishment by their caregivers (OR = 3.58).

The adoption of violent behaviour was modeled as a function of the child's characteristics and behaviour as well as his/her family background. All individually predictive variables were considered; however, to avoid multiple collinearity, the number of offspring was included but not the family

size. Two models were constructed: the first model included the father's occupation and the mother's working status but not the cause of family disruption since these two variables were considered missing if the family was disrupted by reason of death. This model revealed that the father's occupation and mother's working status were not predictive of a child's violent behaviour. In the second model, these variables were replaced by the cause of family disruption. This model pointed to 16 predictive variables which correctly classified 61.25% of children and adolescents adopting violent behaviour.

Violent behaviour was predicted by male gender, smoking and a preference for televised violence coupled with imitation of violent acts. It was also predicted by a number of problematic behaviours including verbal fighting, threatening to attack others physically, being dangerously daring and taking risks and being cruel to animals. This was in addition to disruption of class discipline and truancy from school or running away from home. Being subjected to physical punishment at home and at school were significant independent predictors of

Table 6 Independent significant determinants of violent behaviour

Significant predictors and coding scheme	Regression coefficient	Adjusted OR	P
Gender female = 0; male = 1	1.2337	3.4341*	0.00000
Smoking No = 0; yes = 1	0.6756	1.9652*	0.0130
Preference for televised violence No = 0 Yes without imitation = 1 Yes with imitation = 2	0.1461 0.5112	1.1573 1.6673*	0.4354 0.0159
Often disrupt class discipline No = 0; yes = 1	0.4876	1.6284*	0.0008
Dangerously daring and risk-takers No = 0; yes = 1	0.2634	1.3014*	0.0177
Often cruel to animals No = 0; yes = 1	0.6132	1.8464*	0.0257
Often fight verbally No = 0; yes = 1	1.1950	3.3035*	0.0000
Often threaten to attack others physically No = 0; yes = 1	1.0093	2.7436*	0.0000
Have friends with whom they spend leisure time No = 0; yes = 1	0.2227	1.2494*	0.0754
Contribute to the family income No = 0 Summer job = 1 Year-round job = 2	0.1899 0.6328	1.0291 1.8829*	0.1424 0.0858
Truant from school or runaway from home No = 0; yes = 1	0.5886	1.8015*	0.0002
Subjected to corporal punishment at home No = 0; yes = 1	1.0940	2.9863*	0.00000
Subjected to corporal punishment in school No = 0; yes = 1	0.4409	1.5541*	0.0008
Parental smoking, consumption of alcoholic beverages or psychoactive substances No = 0; yes = 1	0.1852	1.2035*	0.0827
Number of offspring	0.0515	1.0529*	0.0863
Crowding index	0.0941	1.0987*	0.0723

* statistically significant

OR = odds ratio

interpersonal violence. In terms of family background, independent determinants were a large number of offspring, high crowding index, unfavourable economic circumstances forcing the index child to take a job while attending school, as well as parental smoking, consumption of alcoholic beverages or use of psychoactive substances (Table 6).

Discussion

This study revealed that just over half of the boys and less than a quarter of girls enrolled in preparatory and secondary schools took the initiative in physically attacking others. These figures are alarming as they are comparable to those reported by Cotten et al. [11] and Hausman et al. [12] among school students in the United States of America, a country where violence has reached epidemic proportions [2,3].

The extent of interpersonal violence revealed in our study among a normative population attending school deserves the attention of health professionals. Gaining information on adolescents' risk behaviour for a violent act is the first step for planning effective intervention strategies [2]. In this context, the public health approach to violence using the classic triad (host, agent and environment) was applied to identify potential modifiable risk factors.

The present study demonstrated that the male gender is a significant independent predictor of physical violence as has been shown in many previous studies [1,2,5,7, 11-13]. This gender variation has been attributed to the effects of masculinizing chromosomes and hormones in arousing aggressive drives [14]. These aggressive drives are illustrated by the higher likelihood of boys to use sticks, stones and sharp instruments during a physical attack thus

inflicting more frequent and severe injuries on their victims. Although the full extent of inflicted injuries could not be ascertained in a proportion of victims because they were strangers and never seen thereafter, and it was therefore not known to the assaulters whether or not their victims sought medical care, almost all the reported injuries were not fatal. This can be partly attributed to the characteristics of the population studied. Since the students were drawn from a normative population, non-lethal forms of aggression are more frequently expected. The tools used have far less harmful effects than handguns which can result in the serious and fatal outcomes of interpersonal violence in American society.

Interpersonal violence appears to be more of a problem among preparatory school students than secondary ones. This cannot be attributed to the immature responses characteristics of young age as, in this series, age was not predictive of physical violence. However, it is possible that students who are more likely to engage in violent behaviour are also less likely to pursue higher studies. These students may have transferred to technical schools or even dropped out of the educational system and thus, were not included in the sample. This finding indicates the need to target preventive and interventive efforts to preparatory schools.

Verbal aggression, including verbal fighting and threatening to attack, strongly predicts physical violence. It is clear that verbal fights arouse aggressive drives that escalate into a threat of physical attack that paves the way for an assault. Such students are apt to welcome physical violence without fearing its sequelae, either for themselves or for their victims, since they reported being dangerously daring and being risk-takers. In addition, their rebellion against social norms and standards is re-

flected by their habit of smoking. This is particularly true as, in a society such as in Egypt, smoking in this age group is a totally unacceptable behaviour. Hence, the engagement of smokers in other forms of unacceptable behaviour is not surprising.

Kashani et al. [5] reported that the use of verbal as well as physical aggression is significantly associated with the diagnosis of conduct disorders. Furthermore, untreated conduct disorders are strong predictors for serious violence and a wide array of delinquent acts [15]. Although our study did not attempt at a diagnosis, it demonstrates a significantly higher likelihood of physical violence among children and adolescents who reported disturbing behaviour, which may raise the possibility of conduct disorders. These youngsters were more likely to admit that they often told lies, damaged others' property and were cruel to animals. They were also often truant from school or ran away from home. Besides being an indicator of disturbed conduct, truancy from school or running away from home reflects the weak bond between children and nurturing agencies that was viewed by Saner and Ellickson [7] to increase the likelihood of serious violence among boys. The findings underscore the role of school and family in moderating students' behaviour. It is the role of public health professionals to strengthen the affiliation of youngsters to their family and school. Unfortunately, in previous communications, it has been demonstrated that these truants were subjected to corporal punishment that reached extreme physical brutality amounting to abuse both at home and at school [16, 17]. These findings are worth considering when attempts are made to minimize the risk of violent behaviour by targeting the bond between students and their family and school.

A considerable number of researchers have revealed the contribution of corporal

punishment [6,18–21] and physical abuse [3,22–26] to the later use of violence against others. Our study illustrates that exposure to physical violence in a disciplinary context acts independently in the generation of interpersonal violence. Owing to the cross-sectional design of the study, the direction of causality could not be established. It is possible that the students were subjected to harsh disciplinary means because of their violent behaviour but it is equally possible that their violent behaviour is the mere consequence of their exposure to violence. However, a prospective study conducted by Widom [27] over a two-year period provides dramatic support for the notion that violence breeds violence. It has been postulated that youngsters exposed to violence assume an active role by becoming the agent of aggressive violence rather than remaining its passive victims [28]. The physical pain experienced may trigger aggressive drives with the motive to harm or injure others, which find expression against any available target, including ones not in any way responsible for the suffering [29]. On the basis of the social learning process, aggressive behaviour has been viewed as the consequence of the observational learning that takes place while receiving corporal punishment [6,11]. It is worth mentioning that factors associated with resiliency are not totally independent of the strongest predictor of adolescents' use of violence, namely their previous exposure to violence. Furthermore, physical violence modelled by nurturing figures affirms that this is the adult way of resolving conflicts and solving problems.

Another source of modelling violent behaviour that poses a danger is the media. Previous studies have emphasized the contribution of televised violence to the development of aggressive and violent behaviour [4,8,30–33]. This is illustrated in

our study by the significantly higher propensity for violent behaviour among students who reported a preference for televised violence. The imitation of scenes watched is not uncommon particularly in this age group [34]. In our study, a fair proportion of students who reported a preference for televised violence also reported the imitation of violent scenes. Such preference coupled with imitation was associated with a substantial increase in violent behaviour directed against others, even after controlling for other factors. This is not surprising since violent programmes are stylized to demonstrate violence as the primary effective strategy for solving problems and resolving conflicts that receive social affirmation with little evidence that alternatives have been considered [8,31]. Moreover, televised violence provides young people with the means of harming others not previously present in their repertoire of behaviour [29].

Students who reported disrupting class discipline and failing at school, which was indicated by resitting an exam or repeating a grade, showed a significantly higher tendency to violent behaviour. In fact, previous studies have pointed to the association of learning difficulties, low academic orientation and school failure with disruptive and violent behaviour [1,7,15,35]. However, considering all individually significant factors, the academic progress of the students at school was not a predictor of violent behaviour, but their likelihood to disrupt class discipline was found to act independently. Apparently, their way of conducting themselves in a classroom setting is part of a more serious pattern of behaviour.

Interesting to note is that students who are at a higher risk of interpersonal violence are the ones more likely to have friends with whom they spend leisure time.

As physical assaults are usually initiated by a group of youngsters rather than individually, it can be said that these students associate with friends who conform to their standards, which makes attacking strangers possible during their leisure time. Furthermore, the propensity for attacking strangers is documented in this study. Peatsch and Bertrand [1] asserted that students' engagement in property damage and violence-related behaviour is strongly predicted by the pattern of behaviour of their peers rather than the frequency of association.

In terms of family profile, univariate analysis identified the contribution of the parental level of education to the generation of violent behaviour. The highest risk of this behaviour was encountered among students whose parents were illiterate or just able to read and write and those who had completed their basic education. Moreover, this study, as well as previous ones, pointed to an association between parental employment status and the propensity for violent behaviour, underscoring the role of unemployment in this connection [4,13]. On the other hand, maternal employment status was found to be a factor for resiliency. All these factors combined reflect that students involved in interpersonal violence are a socially disadvantaged group, and a wide range of behavioural malfunctioning amounting to delinquency has been observed among children of poor socioeconomic status [10,13,15,23] as it strongly influences parenting style and the degree of supervision of adolescents' behaviour.

Another reason for adolescents' disruptive behaviour, second to poor adult monitoring and supervision, is being brought up by a single parent [36]. This finding is inconsistent with that of the present study as such students were found to be resilient to physical violence compared with those liv-

ing with both biological parents. It is the cause of the single-parent family rather than the status which predicts violent behaviour. The resiliency encountered among students who had experienced the death of a parent can be attributed to the fact that, following such an unfavourable event, the remaining parent assumes the role of the lost partner in monitoring and supervising the children's behaviour. It is also not unlikely in our society that this responsibility will be assumed by members of the extended family. This is not the case following parental divorce or separation, and the hostile family environment dominating prior to divorce has been directly incriminated in the genesis of aggression [9], which enhances the use of physical violence as a problem-solving tactic [5].

The possibility of the contribution of limited financial resources to the generation of behaviour problems among children of single-parent families has also been raised by Acock et al. [37] and Takeuchi et al. [38]. However, our study pointed to the propensity for violent behaviour among students who reported an excess family income allowing saving. These findings emphasize the contribution of a large income in the absence of parental supervision to behavioural problems of children and adolescents. Equal to an excess family income, poverty was found to increase the risk of violent behaviour. The highest risk was encountered among children who suffered economic hardship forcing them to take a job while attending school. Pearson et al. [39] suggested that, among low-income families, the economic strain experienced is so great that neither parent is available to provide sufficient nurturing or structure to allow the children to develop self-control.

Besides the economic strains, a stressful environment can play a role in the develop-

ment of aggression [10]. Large family size, numerous siblings, living in a shared flat with a high crowding index create a stressful environment that many force children to seek violent behaviour as an outlet. Furthermore, the indulgence of their parents in smoking, drinking and narcotics is merely an escape from the social stress they are experiencing. All these factors have been shown to provoke hostility, aggression and violence [10,20,29,40].

In this study, the multivariate analyses used to model interpersonal violence as a function of a child's characteristics, behaviour and family background identified a large number of independent predictors amenable to modification. Effective intervention strategies should consider children's victimization by using alternatives to corporal punishment in the light of the strong association with the genesis of violent behaviour. Added to this is its extremely doubtful effectiveness as a disciplinary method [18,41,42]. Certainly, when physical pain, aggression and violence are no longer experienced at home or in school, students' ties to these nurturing agencies will increase and moderation of behaviour that predicts violence is expected. Furthermore, by the avoidance of violence modelled in real life, students will come to recognize that physical violence is not an appropriate means of resolving conflicts, and exploring alternative mechanisms for coping will become a more important issue. Indeed, it is the role of school to provide factual information on the risk of adolescents being involved in a violent act, by having the students analyse precursors of a fight or violent act, discussing the potential gains and losses, as well as showing alternatives to fighting. This may minimize the potentially dangerous effect of violence shown by the media.

Considering the alarming extent of interpersonal violence revealed in our study and the modifiable nature of the identified determinants, school-based violence prevention and intervention programmes are

urged. These may prevent the escalation into more serious offences since physical fighting is part of a spectrum of violent behaviour that may result in homicide.

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Accidental injuries are only one of the ill-effects of violence: if other causes are added, such as child abuse and neglect, violent morbidity is becoming more of a burden. Child abuse and neglect includes four distinct conditions: physical abuse, neglect, emotional abuse and sexual abuse. They occur within and outside family settings, in the latter case sometimes in an institutional or noninstitutional setting. Child abuse mortality rates for infants in most countries are estimated at around 7 per 100 000 live births, providing a rough global estimate and indicating only the tip of the iceberg. Although childhood accidents, injuries and disabilities have been recognized as a major problem, meaningful estimates of their incidence worldwide are not available. Greater medical knowledge and better technology mean that more children survive premature birth, congenital malformation, accidents, injuries and malignant diseases. Their survival is often not free of disability.

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