

Risk of aggression and criminal behaviour among adolescents living in Alexandria Governorate, Egypt

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خطر التعدي والسلوك الإجرامي بين المراهقين في محافظة الإسكندرية، مصر إيمان محمد حلمي وهدان، نسرین أحمد النمر، ريهام السيد قطب، أشرف وهدان

الخلاصة: يعتبر إقدام المراهقين على المخاطرة والسلوك الإجرامي من أكثر أشكال العنف مشاهدةً في المجتمع. وقد أجرى الباحثون هذه الدراسة للتعرف على معدل انتشار عوامل التعدي والسلوك الإجرامي والعنف وخطره بين المراهقين في الإسكندرية، مصر، وقاموا بأخذ عينات عنقودية متعددة المراحل من أسر تنتمي إلى جميع المناطق في الإسكندرية، ووجهوا أسئلة مستمدة من النسخة العربية لدليل معهد البحوث واستبيان التحري فيه إلى 783 من أمهات المراهقين الذين تتراوح أعمارهم بين 11-19 عاماً، واتضح من إجاباتهم أن 26.9% من مجمل المراهقين الذين خضعوا للتقييم كانوا معرضين لخطر مرتفع، و20.2% منهم معرضون لخطرٍ مرتفع ارتفاعاً بالغاً للتعدي والسلوك الإجرامي. وقد ترافق ذلك الخطر مع العيش في العشوائيات، والذكورة، وتدني مستوى التعليم والعمل لدى الوالدين، والتعرض للعنف ضمن الأسرة، والتغير في السلوك لدى أي فرد من أفراد الأسرة. ومن خلال التحليل المتعدد المتغيرات، تبين أن المتغيرات ذات الأهمية التي يُعتد بها هي جنس المراهق، ووجود ثغرات سلوكية لدى الأسرة، والعنف الموجه ضد الأخوة والأخوات، وإدمان أحد أفراد الأسرة لإحدى مواد الإدمان.

ABSTRACT Adolescent risk-taking and aggressive behaviours are among the most visible forms of violence in society. A study was carried out to identify the prevalence and risk factors for aggression, violence and criminal behaviour among adolescents in Alexandria, Egypt. Using multistage, cluster sampling of families from all health districts in Alexandria, the mothers of 783 adolescents aged 11-19 years answered an Arabic version of the Mentor Research Institute screening questionnaire. Overall 26.9% of adolescents were assessed to be at high risk and 20.2% at extremely high risk of aggression and criminal behaviour. Living in urban/slum areas, male sex, low level of parents' education/occupation, exposure to violence within the family and changes in behaviour of any family member were associated with risk of aggression/violence. In multivariate analysis, the significant independent variables were adolescents' sex, presence of behavioural changes in the family, violence against brothers and sisters and substance abuse by any family member.

Risque d'agression et de comportement criminel chez des adolescents vivant dans le gouvernorat d'Alexandrie (Égypte)

RÉSUMÉ La prise de risque chez les adolescents et les comportements agressifs sont les formes les plus visibles de la violence en société. Une étude a été menée pour identifier la prévalence et les facteurs de risque d'un comportement agressif, violent et criminel chez des adolescents à Alexandrie (Égypte). À l'aide d'un échantillonnage en grappes à plusieurs degrés de familles dans tous les districts sanitaires d'Alexandrie, les mères de 783 adolescents âgés de 11 à 19 ans ont rempli le questionnaire de dépistage du *Mentor Research Institute* dans sa version en langue arabe. Globalement, 26,9 % des adolescents ont été évalués comme étant à haut risque et 20,2 % à extrêmement haut risque de comportement agressif et criminel. Le fait de vivre dans des zones urbaines/d'habitat insalubre, d'être de sexe masculin, d'avoir des parents dont le niveau d'études/professionnel est faible, d'être exposé à une forme de violence familiale et à des modifications de comportements de membres de la famille ont été des facteurs associés au risque de comportement agressif/violent. À l'analyse multivariée, le sexe de l'adolescent, la présence de changements comportementaux dans la famille, la violence envers les frères et sœurs et la toxicomanie de membres de la famille étaient des variables indépendantes importantes.

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Introduction

Adolescents represent nearly 18% of the world's population. Yet, despite their importance as the future generation of adults, they receive less attention to their health concerns than other age groups [1]. Adolescence is a stage of human development in which risk-taking and violent behaviours are common [2,3]. Almost everywhere the main victims, not only the perpetrators, of such violence are the adolescents and young adults themselves [4]. The problem of adolescent violence cannot be viewed in isolation from other problem behaviours, such as truancy and dropping out from school, substance abuse, compulsive lying and reckless driving. However, not all violent adolescents have significant problems other than their violence and not all adolescents with problems are necessarily violent [5].

Adolescent aggression and violence often emanates from multiple risk factors, including biological vulnerability; an inconsistent, overly permissive or harsh family environment; community deprivation; poor social attachment; easy access to weapons; and exposure to violence [6]. Violent behaviour rarely appears spontaneously; it typically has a long developmental pathway. In certain instances, aggression may be a response to stress that occurs during a vulnerable period of life, and an individual may not respond in the same volatile way at a different time in his/her life. However, there is usually some continuity in violence between childhood, adolescence and adult life [2]. Identification of adolescents who are exposed to multiple risk factors can help to inform interventions before the aggressive behaviour becomes chronic, frequent, pervasive and severe. Examining the primary risk factors and developmental pathways will also help to enhance understanding of aggression and to devise effective interventions [2].

Adolescents in Egypt amount to nearly 20 million and hence represent a substantial proportion of the country's human potential. They are exposed to the many of the same risk factors that predispose to aggression and criminal behaviour elsewhere in the world. Exposure to violence among adolescents, particularly violence in the community, may also have increased recently due to the political instability and conflict in Egypt since 2011, as reported in the media. This exposure could be direct (being involved) or indirect (being witnesses) to violence. The aim of the current study was to identify the risk factors responsible for aggression, violence and criminal behaviour and assess the magnitude of these risks among adolescents living in Alexandria Governorate, Egypt.

Methods

Study sample

A multistage, cluster sampling technique was used to select a representative sample of families from the 8 health districts in Alexandria taking into consideration the estimated population size of these districts for the year 2010 [7]. The sample size was determined using *Epi-Info*, version 6. Based on the assumption that the risk of aggression is 50%, precision is 5% and design effect is 2, the calculated sample at 95% confidence level was found to be approximately 770 persons. According to census data, the average number of adolescents aged 11–19 years per family was 0.8 and therefore a total number of 1000 families were suggested to obtain the desired number of adolescents. Thirty clusters from different districts of Alexandria were selected using probability proportionate to size. Each cluster was composed of at least 35 families. The resulting sample amounted to 1031 families who were found to have 829 adolescents; detailed information was possible to collect from 783 (94.5%) of these adolescents. The

study was carried out during the second quarter of 2012.

An informed consent was taken from the interviewed parent and in the case of an adolescent aged 16+ years his/her consent was also taken. The purpose of the research, confidentiality of information and benefit to the population was explained to the participants. Anonymity and confidentiality were guaranteed and maintained.

Data collection

The selected families were visited by trained interviewers who collected data about the adolescent using a predesigned interview questionnaire by interviewing the mother or, in the event she was not available for interview, collecting data from the father or in a few cases a grandparent or an older sibling.

The questionnaire consisted of 2 sections. The first section collected data about the adolescent's and the family's sociodemographic characteristics, and asked about the presence of violence and its type among the adolescent's family and the presence of cases of substance abuse among family members. The second section of the questionnaire addressed various behaviours of the adolescents including antisocial behaviours, aggression and criminal tendencies. An Arabic translation of the screening questionnaire developed by the Mentor Research Institute was used for this part of the study [8]. It consisted of 51 items; each item was given a score. The total risk score was calculated by summing scores of all items and the level of risk was classified as low (score ≤ 16), moderate score 17–32), high (score 33–84) and extremely high (score ≥ 85).

The validity of the English version of the Mentor Research Institute questionnaire has been reported by the original authors of the tool. For this study an Arabic translation of the questionnaire was checked by forward then backward translation by qualified interpreters. The

questionnaire was subsequently modified and its reliability was tested through a pilot study on 20 participants. The internal consistency of the Arabic version of the scale as measured by Cronbach alpha was 0.94. Its content validity was confirmed through an extensive literature review and through experts specialized in behavioural sciences and mental health.

Data analysis

The risk score was computed and the association between the score and covariates was assessed by univariate analysis. The 5% level was used as the cut-off value for statistical significance. Multiple regression analysis was applied with the aggression score being the dependent variable against all other variables as independent variables.

Results

The level of risk of aggression and criminal behaviour among the studied adolescents are presented in Table 1. According to the adopted classification, 32.0% of the adolescents were at low risk, 20.9% at moderate risk, 26.9% at high risk and 20.2% at extremely high risk of aggression and of criminal behaviour.

Table 2 shows the distribution of adolescents according to some sociodemographic factors and level of risk. Those living in rural areas showed much lower risk of aggression than those living in urban or slum areas. The difference in the level of risk between areas of living was statistically significant ($\chi^2 = 17.67, P < 0.05$). Those who were in the early years of adolescence showed significantly higher rates of high and extremely high risk of aggression than those who were in the later years of adolescence ($\chi^2 = 18.45, P = 0.005$). Male adolescents had significantly much higher rates of risk for aggression than females, particularly with

regard to the extremely high risk level ($\chi^2 = 34.01, P < 0.005$).

Analysing the risks according to socioeconomic standard of the family of the adolescents, it was found that the higher the level of education of the parent, the lower the rate of extremely high risk of aggression. This association was found to be statistically significant for fathers' ($P = 0.001$) and mothers' education ($P = 0.02$). Adolescents of families where fathers were professionals had significantly lower rates of being at extremely high risk of aggression (Monte Carlo $P = 0.005$). A similar picture was seen concerning mothers' occupation. Adolescents of mothers with a professional job had lower rates of extremely high risk of aggression and the reverse was seen for mothers who were doing unskilled work outside their homes, although the differences were not statistically significant. The crowding index at home was studied to see if there was an effect on the risk of aggression among adolescents. Table 2 shows that for those living with < 2 persons/room the rate of extremely high risk of aggression was slightly lower than that among those living under more crowded conditions, but these differences were not statistically significant ($\chi^2 = 15.07, P = 0.09$).

Table 3 shows that during their lifetime, 511 of the 783 studied adolescents (65.3%) had been exposed to or witnessed violence within their families. The risk of aggression, particularly the very high risk level, was nearly 4 times higher among adolescents who

lived in families with violence at home. This difference was highly significant ($P < 0.001$). Studying the type of violence and the person targeted, the table shows that when there was violence against the mother the risk of aggression among adolescents, particularly the high risk category, increased significantly. This was the case whether the violence was physical or verbal. This increase was statistically significant ($\chi^2 = 27.39$ and 20.06 respectively, $P < 0.001$). The same picture was observed when the family violence was against the brothers or sisters of the adolescent, whether it was physical or verbal. The rate of very high risk of aggression when there was violence against brothers and sisters was significantly 2–3 times higher than when there was no violence ($\chi^2 = 44.24$ and 46.24 respectively, $P < 0.001$). The table also shows that violence against the adolescents' mothers was more often verbal than physical (4:1). This was also true for brothers and sisters but to a lesser degree (2:1).

Table 4 shows that the rates of exposure to violence at home were very similar for male and female adolescents: 276/419 (65.9%) and 235/364 (64.6%) respectively. However, the risk of aggression and violence, particularly the high and extremely high risk categories, were significantly higher among male than female adolescents.

Respondents were asked about any change in behaviour of any family member which might be manifested in the form of depression, aggression,

Table 1 Distribution of studied adolescents according to their risk for aggression and criminal behaviour (Alexandria, 2012)

Risk of aggression and criminal behaviour ^a	No	%
Low risk (score ≤ 16)	250	32.0
Moderate risk (score 17–32)	164	20.9
High risk (score 33–84)	211	26.9
Extremely high (score ≥ 85)	158	20.2
Total	783	100.0

^aScores on the Mentor Research Institute's screening questionnaire for youth at risk [8].

Table 2 Distribution of studied adolescents according to their sociodemographic characteristics and their risk of aggression and criminal behaviour (Alexandria, 2012)

Variable	Total	Low risk		Moderate risk		High risk		Extremely high risk		Test of significance
	No.	No.	%	No.	%	No.	%	No.	%	
Total	783	250	32.0	164	20.9	211	26.9	158	20.2	
Area of living										
Urban	504	139	27.6	116	23.0	148	29.4	101	20.0	$\chi^2 = 17.67$; $df = 6$; $P = 0.007$
Rural	152	65	42.7	29	19.1	29	19.1	29	19.1	
Slum	127	46	36.2	19	15.0	34	26.8	28	22.0	
Age (years)										
11–	319	83	26.0	63	19.7	92	28.8	81	25.4	$\chi^2 = 18.45$; $df = 6$; $P = 0.05$
14–	285	102	35.8	58	20.4	82	28.8	43	15.1	
17–19	179	65	36.3	43	24.0	37	20.7	34	19.0	
Sex										
Male	419	109	26.0	75	17.9	124	29.6	111	26.5	$\chi^2 = 34.01$; $df = 3$; $P < 0.001$
Female	364	141	38.7	89	24.5	87	23.9	47	12.9	
Father's education (n = 746)^a										
Illiterate/just read & write	227	86	37.9	33	14.5	51	22.5	57	25.1	$\chi^2 = 28.24$; $df = 9$; $P < 0.001$
Primary/preparatory	103	34	33.0	20	19.4	23	22.3	26	25.2	
Secondary/diploma	312	84	26.9	75	24.0	94	30.1	59	18.9	
University/higher	104	32	30.8	30	28.8	32	30.8	10	9.6	
Mother's education (n = 776)^a										
Illiterate/just read & write	331	108	32.6	61	18.4	81	24.5	81	24.5	$\chi^2 = 20.51$; $df = 9$; $P = 0.02$
Primary/preparatory	101	29	28.7	28	27.7	19	18.8	25	24.8	
Secondary/diploma	275	85	33.3	56	26.1	89	32.4	45	16.4	
University/higher	69	23	31.6	18	21.0	21	27.1	7	10.1	
Father's occupation (n = 746)^a										
Unskilled	176	61	34.7	37	21.0	41	23.3	37	21.0	MC $P < 0.001$
Skilled	154	54	35.1	23	14.9	45	29.2	32	20.8	
Clerical	117	29	24.8	31	26.5	30	25.6	27	23.1	
Commerce	111	22	19.8	22	19.8	41	36.9	26	23.4	
Professional	104	31	29.8	33	31.7	29	27.9	11	10.6	
Retired	60	29	48.3	10	16.7	7	11.7	14	23.3	
Other	24	10	41.7	2	8.3	7	29.2	5	20.8	
Mother's occupation (n = 776)^a										
Housewife	576	192	33.3	121	21.0	141	24.5	122	21.2	MC $P < 0.001$
Professional	80	29	36.2	12	15.0	28	35.0	11	13.8	
Clerical	79	16	20.3	21	26.6	28	35.4	14	17.7	
Unskilled	41	8	19.5	9	22.0	13	31.7	11	26.8	
Crowding index (persons/ room)										
< 2	387	131	33.9	68	17.6	116	30.0	72	18.6	$\chi^2 = 8.70$; $df = 6$; $P = 0.191$
2–	313	95	30.4	76	24.3	74	23.6	68	21.7	
3+	83	24	28.9	20	24.1	21	25.3	18	21.7	

^aExcluding those who were dead.

df = degrees of freedom; MC = Monte Carlo.

Table 3 Relationship between adolescents' exposure to violence at home and their risk of aggression and criminal behaviour (Alexandria 2012)

Variable	Total		Low risk		Moderate risk		High risk		Extremely high risk		Statistics
	No.	No.	No.	%	No.	%	No.	%	No.	%	
Total	783		250	32.0	164	20.9	211	26.9	158	20.2	
Violence in the family											
Violence	511		138	27.0	99	19.4	136	26.6	138	27.0	$\chi^2 = 46.94; df = 3; P < 0.001$
No violence	272		112	41.2	65	23.9	75	27.6	20	7.4	
Violence against mother											
Physical											
Yes	111		20	18.0	18	16.2	32	28.8	41	36.9	$\chi^2 = 27.39; df = 3; P < 0.001$
No	672		230	34.2	146	21.7	179	26.6	117	17.4	
Verbal											
Yes	430		121	28.1	88	20.5	110	25.6	111	25.8	$\chi^2 = 20.06; df = 3; P < 0.001$
No	353		129	36.5	76	21.5	101	28.6	47	13.3	
Violence against brothers or sisters											
Physical											
Yes	172		42	24.4	23	13.4	42	24.4	65	37.8	$\chi^2 = 44.24; df = 3; P < 0.001$
No	611		208	34.0	141	23.1	169	27.7	93	15.2	
Verbal											
Yes	388		99	28.5	72	18.6	102	26.3	115	29.6	$\chi^2 = 46.24; df = 3; P < 0.001$
No	395		151	38.2	92	23.3	109	27.6	43	10.9	

df = degrees of freedom.

criminal tendency or withdrawal from the community. Table 5 shows that in the risk of aggression among adolescents, especially the extremely high risk category, increased significantly with reported behavioural changes in any family member (Monte Carlo $P < 0.001$). The same was also observed

when any member of the family was a substance abuser (cannabis, heroin, prescription medications, alcohol or others) ($P < 0.001$).

Table 6 presents the results of the multivariate analysis of the relationship between the independent variables and the risk of aggression among

adolescents. It shows that the sex of the adolescent and the presence of behavioural changes within the family were the most significant independent variables, followed by violence against the brothers and sisters of the adolescent and substance abuse by any member in the family.

Table 4 Relationship between adolescents' exposure to violence within their homes by sex of adolescents and their risk of aggression and criminal behaviour (Alexandria 2012)

Sex/Exposure to violence in family	Total		Low risk		Moderate risk		High risk		Extremely high risk		Statistics
	No.	No.	No.	%	No.	%	No.	%	No.	%	
Male											
Exposed	276		61	22.1	38	13.8	78	28.3	99	35.9	$\chi^2 = 39.8; df = 3; P < 0.001$
Not exposed	143		48	33.6	37	26.0	46	24.7	12	16.6	
Total	419		109	26.0	75	17.9	124	29.6	111	26.5	
Female											
Exposed	235		77	32.8	61	26.0	58	24.7	39	16.6	$\chi^2 = 13.9; df = 3; P = 0.003$
Not exposed	129		64	49.6	28	21.7	29	22.5	8	6.2	
Total	364		141	38.7	89	24.5	87	23.9	47	12.9	

df = degrees of freedom.

Table 5 Relationship between behavioural changes and substance abuse in any family member and adolescents' risk of aggression and criminal behaviour (Alexandria 2012)

Variable	Total		Low risk		Moderate risk		High risk		Extremely high risk		Statistics
	No.	%	No.	%	No.	%	No.	%	No.	%	
Total	783		250	32.0	164	20.9	211	26.9	158	20.2	
Behavioural changes											
Yes	169		36	21.3	22	13.0	50	29.6	61	36.1	$\chi^2 = 41.70$; $df = 3$; $P < 0.001$
No	614		214	34.8	142	23.1	161	26.2	97	15.8	
Substance abuse											
Yes	127		25	19.7	35	27.6	31	24.4	36	28.3	$\chi^2 = 15.66$; $df = 3$; $P = 0.001$
No	656		225	34.3	129	19.7	180	27.4	122	18.6	

df = degrees of freedom.

Discussion

Children and adolescents continue to be exposed to several risk factors that can harm their development and contribute to problem behaviours. While many children and adolescents surmount individual risk factors, those who endure several risks simultaneously are more likely to develop serious behavioural problems [9].

This study has shown that 1 in every 5 of the studied adolescents was at extremely high risk of aggression and criminal behaviour and another quarter was at high risk. Although these are high rates it is likely that they are underestimates because they rely on mothers' reporting of incidents, some of which may be undisclosed or minimized.

In this study, a significantly lower risk of aggression and criminal behaviour was found among adolescents

who lived in rural than in urban areas. Rural neighbourhoods and their sociodemographic characteristics are much less conducive to violence than the urban environment. On the other hand, the prevailing conditions in slums are expected to increase the risk of aggression [10]. In this study, adolescents living in slums an urban areas were found to greater high risk and very high risk rates than those living in rural areas. The fact that many of the families living in slum areas in Alexandria are originally from rural areas, and migrated to urban areas in search of a better life, may explain the reason that their risk was not higher than those living in urban areas.

The risk rates for aggression were found to be much higher among young adolescents (11–14 years) than those in the older age groups. The reason for this requires further study but we hypothesize that it could

be attributed to the fact that exposure to violence, which could include hearing about, being told about or seeing evidence of it in the community, has increased in Egypt during the last 2 years, since the political events of 2011. This means that these young adolescents have accumulated more experiences in the last few years than those who are older. It also suggests that as adolescents approach maturity, some of the youthful behaviours or conduct problems tend to disappear [10]. In general, however, the risk for aggression and violent behaviours might show an increase if no measures are taken to address the situation by the relevant authorities.

The impact of sociodemographic characteristics of the families on the risk of aggression among adolescents was evidenced by the negative correlation between the level of education and occupation of parents and the risk of

Table 6 Multivariate analysis of the relationship between some variables and the risk of aggression and criminal behaviour among adolescents (Alexandria 2012)

Independent variable	Standardized coefficient (beta)	t-value	P-value
Behavioural changes in family member	0.211	5.43	< 0.001
Sex of the adolescent	0.217	6.51	< 0.001
Verbal violence against brothers/sisters	0.137	3.95	< 0.001
Substance abuse by family member	0.098	2.84	0.005
Physical violence against spouse	0.090	2.37	0.018

Dependent variable was total risk score of the adolescent.

aggression in adolescents, particularly the high and extremely high categories. Similar results were reported from other studies [11,12].

It is known that experience of violence can lead to harm, which may turn lead to aggression and conduct problems [13,14]. It is also known that children and adolescents who are exposed to real or perceived threats may become conditioned to react with anxiety to a broad range of circumstances and became perpetrators of violence [13]. In this study, where it was possible only to assess exposure to violence within the families either directly (as victims) or indirectly (as witnesses to violence against another family member), it was found that two-thirds of the adolescents had been exposed to violence within their families. A very similar rate of exposure was reported from the United States in 2008 in a comprehensive national survey [15].

The observed higher risk rates of aggression and criminal behaviour among male than female adolescents were similar to reports from other

countries [15,16]. This is probably due to the greater exposure of males to violence than females. In this study, exposure to violence at home was similar between male and female adolescents. However, witnessing or involvement in violence in the community is more likely to occur with male than female adolescents, which could partly explain the higher risk rates of aggression in males, especially in the Egyptian community where it is accepted that males express aggression more than females. Although the linkage between various independent variables was clear, multiple regression analysis highlighted that the presence of behavioural changes in the family, aggression against the children, and substance abuse by any family member were the most significant factors affecting the risk of aggression among adolescents. These results underline the importance of working with families in which aggression is reported in order to reduce the risk to the adolescent family members. Similar studies have also come to the same conclusion [17]. Schools and media can also play a major role in stress

coping among children and youth in several ways such as for example by promoting positive role models. They can also play important roles with the families to reduce the factors that have been shown to increase the risk of aggression and criminal behaviour among adolescents [18].

Conclusions

This study highlighted the high risks of aggression and criminal behaviour among adolescents in Alexandria. It has shown the role played by several factors in this regard. It is sincerely hoped that the responsible authorities and agencies begin to take necessary measures to reduce the negative impacts of exposure to violence through giving special attention to changing the perception of children and adolescents to these risks.

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