

## Prevalence and Associated Factors of Physical, Verbal and Relational Aggression among Iranian Preschoolers

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**Objective:** Childhood aggression may lead to severe social disorders in adolescence and adulthood. Different psychiatric approaches are focused on preschool aged aggressive children. The aim of this study was to estimate the prevalence and associated factors of childhood direct and indirect aggression .

**Methods:** In this cross sectional study a total of 1403 children attending 43 kindergartens were assessed. Data were collected through a structured 46-item questionnaire investigating symptoms of physical, verbal and relational aggression which was completed by parents and teachers of day-care centers. Complex sample survey analysis and multivariate logistic regression method were used for data analysis.

**Results:** According to parents' rating, the prevalence of physical ,verbal and relational aggression, was 9.9% (95% CI=7.4%-12.4%) , 6.3% (95% CI=5.0% -7.6%) and 1.6% (95%CI=1.0%-2.2%), respectively; while based on teachers' rating the prevalence of physical ,verbal and relational aggression were 10.9% (95% CI=8.9% -12.9%), 4.9%(95% CI=3.8% - 6.0%) and 6% (95% CI=4.4% -7.6%), respectively. A wide range of family environment factors including living with a single parent, having a working mother, death of someone close to the child, and having less educated mother were significantly associated with different types of aggression; additionally, there was some evidence of a relationship between sex of the children and physical aggression, after controlling for other variables (p<0.05).

**Conclusion:** This study revealed that children's family environment alongside internal factors plays an important role as an external factor in determining the child's potential aggressive behavior. Given this, to better prevent the aggressive behavior of children, intervention strategies should be planned for families and caregivers; specially mothers should receive training to use such strategies.

**Key words:** *Iranian children, Physical Aggression, Verbal Aggression, Relational Aggression, Children psychology*

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Aggression is a fundamental health problem in children and is one of the most common reasons for referring children to mental health consults (1); in childhood, aggression increases the chance of being a bully, bully/victim and victim (2), and it is also related to maladjusted behavior and undesirable social skills (3). In addition, earlier aggression may lead to several behavioral and social disorders in adolescence and adulthood; for instance, alcohol and drug abuse, violence, depression, suicide attempts, spouse abuse, and neglectful and abusive parenting (4,5). Longitudinal studies show that negative outcomes tend to be more severe for those aggressive behaviors established in early childhood in comparison to early adulthood (6).

The intention of aggressor child to cause harm to another person is the defining characteristic of aggressive behavior either in form of direct (physical or verbal confrontation) or indirect (including relational, social, or indirect aggression); the latter

was introduced in late 1980s (7). In contrast to direct aggression, which aims to harm others through pushing, kicking, hitting, or threatening and insulting a peer (8), relational aggression could be defined as spoiling another's social relationships; for example, excluding another child from a peer group (9).

In developmental approach to child psychology, aggression is a function of both individual factors (e.g. child temperament or genetic factors) and social systems (e.g. parents) (10). Boys are more likely to show direct aggression (11), whereas girls predominantly express their anger in relational form (8). However, addressing gender differences, some authors do not believe in such role, for example, a meta-analysis of 107 studies on in direct and indirect aggression reported no significant gender differences (12). In addition to emphasized role of gender, in literature, many other risk factors have been mentioned; for instance, living along young siblings, maternal antisocial behavior in adolescence, youth

pregnancy, low income and smoking during pregnancy period (4). Another study added other risk factors such as children whom are looked after by their own mothers versus those attending group day-care (13) and friends' aggression in kindergarten (14). Because the most effective programs to prevent adulthood and adolescence aggression focus on children (4), identifying its prevalence and associated factors could help intellectuals to have a better understanding of this problem in our country. Thus, our study addresses the prevalence of physical and verbal aggression as two forms of direct aggression and relational aggression as a well-known form of indirect aggression, alongside their associated factors in a sample of preschool-aged children who attended Tehran day care centers.

## Material and Methods

This cross sectional study was conducted to estimate the prevalence of three types of aggression (verbal, physical and relational) among children aged 3-6 years in kindergartens of Tehran, in 2009. Sampling was done according to a multistage stratified cluster sampling, and Tehran was divided into 22 strata as for municipal districts, and each kindergarten in every district was considered as a cluster. 43 kindergartens (clusters) were selected randomly from strata, number of kindergartens per each strata calculated proportionate to the size of each strata. A total of 1403 children were assessed. We used a 46-item questionnaire for data collection; of which, 14 items regarded demographic variables while 22 items investigated symptoms of aggression. Of these 22 questions, 5 items questioned physical aggression, 5 for verbal aggression and 12 for relational aggression. We used the questionnaire developed by Sima Shahim (15). Validity of this questionnaire was previously assessed which was acceptable. (15) The reliability of our questionnaire was evaluated in a sample of 30 children of a kindergarten, and Cronbach's  $\alpha$  was 0.79. Both parents and teachers were asked to fill out the questionnaires at the same time for any child. Teachers had to work with children for at least for 3 months to be able to rate them according to our objectives. There were three possible answers for each symptom item: "Never does" (1 score), "Sometimes does" (2 scores) and "Always does" (3 scores). Thus, the overall score estimated for aggression was sum of the scores for physical, verbal and relational aggression which was between 22 and 66; similarly, the score between 5 and 15 was considered for verbal and physical aggression and the scores of 12-36 for relational aggression. The cut off score for dividing children into two groups of aggressive and non-aggressive was 50% of maximum possible scores. We studied a number of internal and external factors and their association with aggression and its subsets. The internal factors (those which may intrinsically affect children) were gender, birth year (2002-2005), child disease, interest to watch violent

TV programs; the external factors (which affect children from outer environment) were number of children in family, rank of birth of the given child, maternal age at birth, mother's smoking during pregnancy, single parent family, death of family member (at least one of the first relatives who had a close relationship with the child during the past year), chronic disease in family, mother's occupational status and educational level, father's occupational status, and educational level.

Finally, both parents' and teachers' assessments were analyzed through complex sample survey analysis and chi-square test used to assess the relationship between the outcome and independent variables, respectively. In order to assess the main and confounding effects of independent variables and to determine adjusted odds ratios, multiple logistic regression method was used across explanatory variables. We utilized the SPSS statistical package (v19) to analyze data

## Result

Detailed description of variables of the study has been published earlier (16).

There are two different rates reported for evaluation of children behavior, acquired from parents and teachers. According to parents' rating, the prevalence of physical aggression was 14.4% (CI95%=10.8-18.0%) in boys and 4.7% (CI95%=2.7-6.7%) in girls, while according to teachers' rating, these rates were 15.6% (CI95%=12.8-18.4%) among boys and 6.3% (CI95%=4.2-8.4%) among girls (table 1). Furthermore, according to parents' rating, the prevalence of physical aggression was 19.9% (14.8-25.0%) among those children who watched violent TV programs regularly, while this rate was 4.9% (3.4-6.4%) [OR of the comparison=4.8 (CI95%=3.03-7.63)] among children unwilling to watch such programs. Teachers' evaluation showed almost similar rates [16.8% (13.9-19.7%) vs. 8.7% (6.9-10.5%), OR=2.10 (CI95%=1.60-2.75)]. According to parents' evaluation, the prevalence of physical aggression was higher among children with death of their family members versus all alive families [13.7% (CI95%=11.4-16.0%) vs. 8.3% (CI95%=6.1-10.5%), OR=1.75 (CI95%=1.31-2.32)] and children whose mother were employee vs. Housewife or having free job [13.2% (CI95%=9.2-17.2%) vs. 7.3% (CI95%=5.3-9.3%), OR=1.92 (CI95%=1.14-3.21)].

As demonstrated in table 4, in multivariate logistic model, based on parents' rating, child gender, birth year before 2004, maternal employment, death of family member, and willingness to watch violent TV programs were independent associated factors of physical aggression, whereas in teachers' rating only child gender and interest to watch violent TV programs were statistically meaningful associated factors.

**Table1: Prevalence of Physical aggression among children based on scores acquired from their parents and teachers**

Variable	Sub Groups	Parents			Teachers		
		Prevalence (CI95%)	OR (CI95%)	P value	Prevalence (CI95%)	OR (CI95%)	P value
Gender	Boy	14.4% (10.8-18.0%)	3.43 (1.95-6.06)	<0.001	15.6% (12.8-18.4%)	2.75 (1.70-4.44)	<0.001
	Girl	4.7% (2.7-6.7%)			6.3% (4.2-8.4%)		
Birth Year	2002-2004	16.8% (11.3-22.3%)	2.27 (1.52-3.39)	<0.001	9.9% (5.1-14.8%)	0.56 (0.24-1.31)	0.188
	2005-2006	8.1% (6.1-10.1%)			16.3% (4.9-27.7%)		
Violent TV programs	Regular	19.9% (14.8-25.0%)	4.8 (3.03-7.63)	<0.001	16.8% (13.9-19.7%)	2.10 (1.60-2.75)	<0.001
	No favor	4.9% (3.4-6.4%)			8.7% (6.9-10.5%)		
Family Death	Yes	13.7% (11.4-16.0%)	1.75 (1.31-2.32)	0.001	10.2% (6.9-13.5%)	0.88 (0.36-2.16)	0.497
	No	8.3% (6.1-10.5%)			11.4% (9.5-13.3%)		
Maternal occupational status	Employee	13.2% (9.2-17.2%)	1.92 (1.14-3.21)	0.015	12.2% (9.3-15.1%)	1.20 (0.50-2.88)	0.454
	Housewife or Free job	7.3% (5.3-9.3%)			10.4% (5.2-15.4%)		
Total		9.9% (95% CI=7.4% -12.4%)			10.9% (95% CI=8.9% -12.9%)		

**Table2. Prevalence of Verbal aggression among children based on scores acquired from their parents and teachers**

Variable	Sub Groups	Parents			Teachers		
		Prevalence (CI95%)	OR (CI95%)	P value	Prevalence (CI95%)	OR (CI95%)	P value
Gender	Boy	8.8% (7.6-10.0%)	2.60 (1.61-4.18)	<0.001	7.0% (5.1-8.9%)	2.52 (1.48-4.31)	0.002
	Girl	3.6% (2.3-4.9%)			2.9% (1.8-4.0%)		
Violent TV Programs	Regular	12.3% (10.0-14.6%)	3.54 (2.56-4.92)	<0.001	8.0% (5.3-10.7%)	2.27 (1.32-3.84)	0.005
	No favor	3.8% (3.0-4.6%)			3.7% (2.7-4.7%)		
Family Death	Yes	7.3% (4.9-9.7%)	1.21 (0.40-3.69)	0.413	2.3% (1.1-3.5%)	0.40 (0.21-0.76)	0.008
	No	6.1% (5.1-7.1%)			5.5% (4.2-6.8%)		
Chronic disease in Family members	Yes	15.2% (6.8-23.6%)	2.86 (1.16-7.09)	0.020	17.0% (10.1-23.9%)	4.56 (2.34-8.92)	<0.001
	No	5.9% (5.1-6.7%)			4.3% (3.2-5.4%)		
Maternal level of Education	Less than Bachelor	8.3% (6.6-10.0%)	1.89 (1.37-2.59)	0.001	6.7% (4.6-8.8%)	1.96 (1.28-2.99)	0.004
	Bachelor or higher	4.6% (3.6-5.6%)			3.5% (2.6-4.4%)		
Paternal level of Education	Diploma and lower	8.0% (6.3-9.7%)	1.66 (1.14-2.42)	0.010	5.3% (0-11.2%)	1.31 (0.35-4.90)	0.205
	Higher than diploma	4.9% (3.8-6.0%)			4.1% (0-8.3%)		
Total		6.3% (95% CI=5.3% -7.3%)			4.9%(95% CI=3.8% -6.0%)		

**Table3: Prevalence of Relational aggression among children based on scores acquired from their parents and teachers (NAP=Not Applicable)**

Variable	Sub Groups	Parents			Teachers		
		Prevalence (CI95%)	OR (CI95%)	P value	Prevalence (CI95%)	OR (CI95%)	P value
Gender	Girl	1.2% (0.8-1.6%)	0.60 (0.06-5.82)	0.232	6.7% (4.2-9.2%)	1.28 (0.40-4.15)	0.259
	Boy	2.0% (0.9-3.1%)			5.3% (3.9-6.7%)		
Violent TV programs	Regular	4.2% (2.1-6.3%)	6.57 (2.70-16.12)	<0.001	7.1% (5.2-9.0%)	1.31 (0.42-4.15)	0.229
	No favor	0.7% (0.4-1.0%)			5.5% (3.5-7.5%)		
Maternal age at birth	18-35y	1.9% (1.1-2.7%)	24.70 (16.13-37.23)	<0.001	6.1% (4.5-7.7%)	1.60 (0.44-5.89)	0.348
	<18 or >35y	0.1% (0.1-0.1%)			3.9% (1.3-6.5%)		
Single Parent	Yes	7.3% (2.2-12.4%)	5.17 (1.70-15.69)	0.003	11.9% (4.7-19.1%)	2.32 (0.81-6.64)	0.098
	No	1.5% (0.9-2.1%)			5.5% (3.8-7.2%)		
Chronic disease in Family members	Yes	0% (-)	NAP	0.330	14.0% (6.8-21.2%)	2.79 (1.06-7.29)	0.030
	No	1.7% (1.0-2.4%)			5.5% (3.8-7.2%)		
Maternal occupational status	Employee	2.4% (1.2-3.6%)	2.02 (0.22-18.44)	0.417	7.5% (5.2-9.8%)	1.56 (1.05-2.42)	0.030
	Free job or Housewife	1.2% (0-5.5%)			4.8% (3.2-6.4%)		
Maternal level of Education	Less than diploma	0.1% (0.09-0.11%)	14.5 (8.48-25.04)	<0.001	3.8% (1.6-6.0%)	0.68 (0.18-2.59)	0.413
	Diploma or higher	1.8% (1.1-2.5%)			5.5% (0.8-10.1%)		
<b>Total</b>		1.6% (95% CI=1% -2.2%)			6.0% (95% CI=4.4% -7.6%)		

**Table 4: Multivariate logistic regression analysis (final model) results for associating factors of different (Physical, Relational and Verbal) types of aggression (NS=Not Significant)**

Associated factors of Physical Aggression		
	Parents	Teachers
	Adjusted Odds Ratio (CI95%)	Adjusted Odds Ratio (CI95%)
Sex (boy)	2.15 (1.22-3.83)	2.31 (1.38-3.87)
Birth year before 2004 (>5 year)	0.33 (0.21-0.50)	NS
Maternal occupational status(employee)	1.90 (1.068-3.376)	NS
Death of family member	1.70 (2.52-1.15)	NS
Interest to violent TV programs	3.90 (2.41-6.29)	1.50 (1.08-2.08)
Associated factors of Verbal Aggression		
	Parents	Teachers
	Adjusted Odds Ratio (CI95%)	Adjusted Odds Ratio (CI95%)
Chronic disease in Family members	2.72 (1.10-6.68)	4.79 (2.19 -10.44)
Maternal level of education less than Bachelor	1.70 (1.08-2.67)	1.70 (1.60-2.74)
Death of family member	NS	3.53 (1.49-8.40)
Interest to violent TV programs	2.63 (1.66-4.17)	NS
Associated factors of Relational Aggression		
	Parents	Teachers
	Adjusted Odds Ratio (CI95%)	Adjusted Odds Ratio (CI95%)
Maternal occupational status(employee)	NS	1.84 (1.33-2.54)
Single parent family	4.40 (1.44-13.50)	NS
Chronic disease in Family members	NS	2.75 (1.01-7.46)
Maternal age at birth (18-35 y)	16.33 (10.80-24.68)	NS
Interest to violent TV programs	5.19 (2.47-14.2)	NS

With respect to verbal aggression, according to parents' rating, the prevalence rate was 8.8% (CI95%=7.6-10.0%) among boys and 3.6% (CI95%=2.3-4.9%) among girls (table 2). Seemingly, based on teachers' rating, the prevalence was 2.9% (CI95%=1.8-4.0%) and 7% (CI95%=5.1-8.9%) among girls and boys, respectively. According to parents' rating, the prevalence of verbal aggression was significantly higher among children interested in violent TV programs compared to non-interested (OR=3.54, CI95%=2.56-4.92), children with families affected by a chronic disease compared to healthy families (OR=2.86, CI95%=1.16-7.09), children with less educated mothers [less than bachelor vs. bachelor and higher] (OR=1.89, CI95%=1.37-2.59) and also less educated fathers [less than diploma vs. diploma and higher] (OR=1.66, CI95%=1.14-2.42). However, according to teachers' rating, the prevalence of verbal aggression was higher among children interested in violent TV programs (OR=2.27, CI95%=1.32-3.84), children without death of family member (OR=2.5, CI95%=1.31-4.76), those children having a family member suffering from a chronic disease (OR=4.56, CI95%=2.34-8.92) and also children with less educated Mothers [less than bachelor vs. bachelor and higher] (OR=1.96, CI95%=1.28-2.99).

As presented in table 4, using multivariate logistic regression method of analysis on parents' rating, only the existence of chronic disease in family members, maternal education less than bachelor degree and being interest in violent TV programs were independent associated factors for verbal aggression and gender difference was not statistically significant (P value > 0.05). However, in teachers' rating, chronic disease in family members, being interest in violent TV programs and death in family members were independent associated factors.

In relational aggression, after complex sample analysis, difference of the prevalence was not statistically significant between boys and girls (P value>0.05) both based on parents' and teachers' rating (table 3). However, according to parents' rating, relational aggression was significantly more prevalent among children regularly watching violent TV programs (OR=6.57, CI95%=2.70-16.2), children whose mothers were 18-35 years at pregnancy (OR=24.70, CI95%=16.13-37.23), children with single parent families vs. couple parents (OR=5.17, CI95%=1.70-15.69) and also children with more educated mothers [diploma and more vs. less than diploma] (OR=14.5, CI95%=8.48-25.04). On the other hand, based on teachers' rating, children who had a family member with a chronic disease (OR=2.79, CI95%=1.06-7.29) and children with employee mother vs. housewife (OR=1.56, CI95%=1.05-2.42) showed significantly higher prevalence of relational aggression.

Based on parents' rating, the independent associated factors after multivariate logistic analysis, were maternal age at birth (18-35), interest in violent TV

programs and single parent families; however, in teachers' rating, maternal employment and chronic disease affecting family members were associated factors for relational aggression (table 4).

## Discussion

Overall, in our study, considering 95% confidence interval, there was no significant difference in total prevalence rate between parents' and teachers' rating except for relational aggression. The prominent difference between prevalence rates in relational aggression could be due to the fact that relational aggressive behaviors are more apparent in the context of children's interactions with their peers (9) which could remain hidden from parents' observation, while teachers dealing with many peer groups can easily notice these behaviors in kindergartens. Similarly, McNeilly-Choque et al. after studying two hundred forty one 4-5 year old preschoolers report that inter-method agreement between the teacher, peer and observer scores was higher for overt (direct) aggression compared to relational aggression (17).

In our study, physical aggression was significantly more common among boys, but verbal and relational aggression did not show any significant gender difference after controlling confounding effects in logistic regression analysis. McEvoy et al. by using 3 methods of teacher rating self-report and peer rating showed that physical aggression is more common among boys, while relational aggression is more prevalent among girls (18). However, Vahedi et al. claimed that there is no significant gender difference in relational aggression while physical and verbal aggression are more prevalent among boys (19). Furthermore, Shahim has evaluated relational aggression in 258 preschool children aged 3 to 7 years and reported no significant sex and age differences (20). Considering the available literature, there is a general disagreement on the role of gender in relational aggressive behaviors during childhood (21). However, the body of the literature supports that although males engage in both physical and relational aggression, females are expected to rely on relational aggression strategies (22). In addition, the different prevalence of aggression between boys and girls could be due to different definitions of aggression in various cultures around the world (23).

Loeber et al. (24), Cote et al. (25) and also Ray et al. (26), in their longitudinal studies claimed that physical aggression tends to decrease among children by increase in age and only small portion of aggressive children remain so in their adolescence; in other words, physical aggression peaks at 30 months of age and then declines. Although our study was not longitudinal, we found a congruent result in association between age and physical aggression. However, in longitudinal studies relational aggression was increased in older

children (22), whereas our study did not show such a relationship.

We found that watching violent TV programs was associated with higher prevalence of verbal, physical and relational aggression; similarly, in a systematic review done by Bushmann and his colleagues, it was indicated that willingness to watch violent TV programs is related to children's aggressive thoughts and acts (27).

In our study, by parents and teachers' rating, children whose mothers were employee showed higher rates of aggression- physical and also relational. It is probable that as employed mothers may spend less time with their children at home, and may have a more stressful home environment due to work-home interference (WHI), their employment could be associated with such predominance. Some authors believe the same, and claim that maternal employment could have negative effects on child's cognitive and behavioral outcomes (28). Nevertheless, some authors do not believe in such relationships and claim that maternal employment has no role in child behavioral outcomes in later life (29).

With respect to the role of maternal education, statistically significant difference was observed among different levels of education; as mothers' educational degree increased, the prevalence of physical (data was not statistically significant and not showed) and verbal aggression decreased, and interestingly relational aggression was increased. Similar pattern was reported by Canadian authors reporting lower prevalence rate of physical and verbal aggression among children whose mothers had bachelor or higher degrees compared to lower ones (25). Previously, Bonica et al. and McNeilly-Choque et al. suggested that among preschoolers, relational aggression was more prevalent among families with high socioeconomic status (which includes parents' education level, employment and family income) (30,17). This could support our findings that relational aggression was more common among children whose mothers had high level of education and were employed.

Sakimura et al. in their study on 3-5 year old American children conclude that medical problems in children would augment the incidence of aggressive behaviors (31). However, in our study, we did not detect any significant difference between physically diseased and healthy children.

Although strong body of evidence supports the impact of maternal smoking during pregnancy on the incidence of children aggression (4,32), we did not find such association in our study; this could be due to very limited number of subjects (0.4%) with history of smoking during pregnancy.

After multivariate analysis, based on parents' rating, single parenthood was a strong associated factor for relational aggression. Vaillancourt and his colleagues mentioned that social support and family functioning were two important factors in relational aggression among preschoolers (22). Thus, consistent to our

results, relational aggression was more prevalent among single parent families that had lower social support and family function.

## Conclusion

More established diagnosis of behavioral disorders is only made by experienced psychologists and psychiatrist in well equipped clinics; however, the environment and family settings have unquestioned role in emerging aggression at childhood. Thus, preventive strategies should be mainly focused on child's family and surroundings. However, mothers have a very important role in children's behavioral disorders; instructing mothers either before pregnancy or after birth could be effective in prevention of aggression in preschool period. Also, interest of children for violent television programs was a strong associated factor for aggressive behaviors which highlights the role of mass Medias as a means of preventive measures. Nevertheless, for more efficient strategies, a multidisciplinary team-work is required which include developmental psychologist and psychiatrists, psychotherapists and also preventive medicine specialists.

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