

## Effectiveness of an exercise regimen program in decreasing aggressive behavior among primary schoolchildren

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### Abstract:

**Background:** The literature links anger, physical exercise, and fitness. The increasing trend of violent events in schools must draw more attention to interventions targeted to reducing school violence. **Aim:** The aim of current study was evaluating the effectiveness of the implementation of an exercise regimen program on aggressive behavior among primary schoolchildren. **Subjects and methods:** **Research design:** The current study was carried out using a quasi-experimental design with pre-post assessment. **Setting:** The study was carried out using a quasi-experimental design with pre-post assessment in Governmental primary school in Zagazig district, Sharkia governorate, Egypt. **Subjects:** It included 110 primary school students selected by stratified random sampling. **Tools of data collection:** An interview questionnaire form was used to assess student's aggressive behavior towards self, others, and properties. The researchers prepared and implemented an exercise regimen and implemented it in 12 sessions of 60 min each. The program effectiveness was assessed through immediate and two-month follow-up posttests. **Results:** Students' age ranged between 6 and 12 years with slightly more males (54.5%). Statistically significant relations were shown between students' pre-intervention aggressive behavior and their age ( $p < 0.001$ ) and gender ( $p = 0.004$ ). The implementation of the program led to significant improvements in all types of students' aggressive behavior at both posttests ( $p < 0.001$ ). Multivariate analysis showed that the study intervention was the only negative statistically significant independent predictor of the score of aggressive behavior throughout the study intervention. **Conclusion:** Aggressive behaviors are prevalent among primary school students, and this can be ameliorated through application of sporting exercises and collective games. **Recommendations:** The developed intervention should be implemented on a wider scale. Randomized controlled trials are needed for unbiased assessment of the effectiveness of the program, with longer follow-up.

**Key words:** Aggressive behavior; Physical exercise; Primary schoolchildren; Intervention

### Introduction:

Aggression is any form of behavior intended to harm or injure another being who is motivated to avoid such treatment <sup>(1)</sup> or harmful, physical or verbal actions directed against other persons, self, or property.<sup>(2)</sup> It refers to a broad spectrum of phenomena with a variety of symptoms triggered by various intra-psychic processes and mechanisms.<sup>(3)</sup> Aggression allows the aggressor to express emotional arousal and release negative emotions that have become uncontrollable.<sup>(4)</sup>

Aggressive behavior is defined as a socially inappropriate or harmful behavior to self or to others.<sup>(5)</sup> A behavior problem is a deviation from the conduct that is appropriate for a

specific age and also interferes with an individual's growth, development and the lives of others.<sup>(6)</sup> A number of factors predispose or influence aggressive behavior such as individual characteristics as low intelligence and hyperactivity <sup>(7)</sup>, family and peer influences <sup>(8)</sup>; home environment and parenting style <sup>(9)</sup>, school failure, <sup>(10)</sup> and exposure to media violence.<sup>(11)</sup>

A rapidly growing literature suggests that physical exercise has powerful effects on brain functions, and on neural and cognitive development. Physical exercise is defined as contrived skeletal muscle movement associated with an increase in energy expenditure with the intention to develop or maintain

physical fitness and/or health. <sup>(12)</sup> Examples include spontaneous or organized physical activities and sport competition. Activities vary from simple repetitive movements as running and walking to complex activities involving additionally cognitive skills as sports games, obstacle courses, and video games. The main variables manipulated in experimental studies the type of exercise, its intensity, and duration. The intensity is defined by percentage of an individual's maximum workload measured by oxygen uptake or heart rate. <sup>(13)</sup>

The literature suggests a link between anger, physical exercise, and fitness. Physical activity has been shown to improve anxiety and depression in adolescents and children <sup>(14)</sup> as well as in adults. <sup>(15)</sup> Studies have also reported relations between anger with physical fitness level. Thus, <sup>(16)</sup> showed a significant correlation between anger scores and the levels of aerobic fitness. Additionally, <sup>(17)</sup> revealed that anger scores predicted adverse laboratory values as high cholesterol, triglycerides, and glucose levels only among physically unfit; they concluded that exercise can reduce anger and buffer its physical consequences.

#### **Significance of study:**

Reductions in aggressive behavior can improve the mental health outcomes of both children who act aggressively and those who have aggressive behaviors directed toward them. Potential benefits to those aggressed against are the reduction in physical injuries and mental health difficulties due to acute or chronic exposure to aggression or interpersonal violence. For aggressors themselves, potential benefits are the reduction in developmental health risks found to be present with aggressive children including: elevated risk for later substance abuse, injuries resultant from risky or violent behaviors, depression, suicide attempts, and spousal and child abuse. Although many of the health

ramifications of aggression are not experienced until adolescence or adulthood, developmental pathways to such outcomes are in place by early childhood. Interventions to limit social and psychological problems associated with aggression and violence increasingly are targeting children at a younger age. <sup>(10)</sup> The increasing trend of violent events in schools must draw more attention to interventions targeted to reducing school violence. From this perspective, this study is aimed at evaluating on aggressive the effectiveness of the implementation of an exercise regimen program behavior among primary schoolchildren.

#### **Aim of the Study:**

The aim of the present study was to evaluate the effectiveness of the implementation of an exercise regimen program on aggressive behavior among primary schoolchildren.

#### **Research hypothesis:**

The implementation of the study intervention was associated with significant improvements in these student's aggressive behaviors.

#### **Subjects and methods:**

##### **Research design:**

The current study was carried out using a quasi-experimental design with pre - post assessment.

##### **Setting:**

The present study was carried out in Governmental primary school in Zagazig district, Sharkia governorate, Egypt. The total number of schools in Zagazig district: educational management eastern Zagazig (117) School, educational management western Zagazig (86) School and educational Administration Alqnayat (12) schools.

##### **Subjects:**

The study subjects consisted of male and female primary schoolchildren at "Mohamed Mustafa Darwish" school at Sharkia Governorate. The total number of students whose age was ranging

between 6 to 12 years old was 499 in 12 classes: 257 boys and 242 girls. The sample consisted of 110 students selected through stratified random sampling to include all six grades. All students were eligible except those with diagnosed psychiatric problems, and those with diseases or disabilities that prevent them from engaging in the exercise program. The sample size was calculated to demonstrate an expected decrease in overall prevalence of aggressive behavior from 50% to 30% or less at 95% level of confidence and 80% power. The required sample size was 103; it was increased to 110 to account for an expected dropout rate of about 5%.

**Sampling technique:**

A stratified multi-stage cluster sampling technique was used in recruiting students in the study sample. At stage I, the school was selected by simple random sampling from each stratum. At stage II, the classrooms were selected by simple random sampling according to grades. At stage III, all the students enrolled in the selected classrooms and fulfilling the inclusion criteria were included in the sample.

**Data collection tool:**

The researchers designed an interview questionnaire form to assess student's aggressive behavior. It included a section for student's and parents' socio-demographic characteristics, as well as some socio-economic details such as family income, crowding index, home media, hobbies, and number of friends. It also included a scale to measure aggressive behavior based on Barker.<sup>(18)</sup> It consisted of 34 statements covering aggressive behavior towards self (6 items such as "wounding self when angry" and "abstaining from eating when angry"), towards others (17 items as "hurting peers intentionally while playing" and "interrupting teacher while explaining lesson"), and towards properties (11 items as "tearing posters on walls" and "throwing garbage in courtyard"). The response was on a 3-point Likert

scale: "applies to me," "sometimes applies to me," and "does not apply to me." These were scored 2 to 0 respectively. The responses of the items of each type of aggressive behavior were summed up and converted into a percent score. A student was considered "high" in aggressive behavior if the percent score was 60% or higher and "low" if less than 60%. The questionnaire was face and content-validated through a panel of experts in nursing and pediatric medicine.

**Pilot study:**

A pilot study was carried out on 10 students to assess the clarity and applicability of the data collection tool, and the time needed for the interview. The tool was finalized based on the results of the pilot, and the pilot sample was not included in the main study sample. The pilot also served to assess the aggressive behavior scale reliability based on its internal consistency. It showed excellent reliability with Cronbach alpha coefficient 0.954.

**Field work:**

The researchers prepared the exercise regimen based on Faiyd.<sup>(19)</sup> It consisted of 12 sessions of 60 min each. Each session consisted of 10 minutes warm-up, 40 minutes main activity, and 10 minutes to end the activity. The sessions included learning objectives such developing social interactions, cooperation and collaboration in activities, emotional expression, gaining friendships, problem solving, as well as following rules and obedience. The activities included running, jumping, playing collective games, etc. The materials used included balloons, balls, plastic bottles, buckets, cups, ropes, rings, paper clips, bean bags, chairs, writing boards, carton boxes, tires, etc.

Upon obtaining official permissions, the researchers recruited the students according to criteria and sample size. The students were informed about the aim and procedures of the study. They were individually interviewed by the

researchers using the data collection tool, and this constituted their pre-test. Then, the program was implemented in sessions for each group of students from the same grade level. Application program was done by a physical education teacher with the help of the social worker and researchers.

After completion of the program, the researchers re-interviewed the students to obtain the immediate posttest evaluation. This was repeated after two months to assess the long-term effect of the program.

#### **Administrative and ethical considerations:**

The study protocol was approved by the research and ethics committee at the Faculty of Nursing, Zagazig University. The researchers obtained official permissions from the Department of Education at Al-qenayat, Zagazig. The parents' consents for students were obtained through the school administration. The consent form explained the study aim in a simple and clear manner to be understood by common people, and clarified the rights to refuse or withdraw at any time. No harmful maneuvers were performed or used, and no foreseen hazards were anticipated from conducting the study on the participants. Data were considered confidential and not be used outside this study without parents' approval.

#### **Statistical analysis:**

Data entry and statistical analysis were done using SPSS 18.0 statistical software package. Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. In larger than 2x2 cross-tables, no test could be applied whenever the expected value in 10% or more of the cells was less than 5. In order to identify the independent predictors of the

aggression score, multiple linear regression analysis was used after testing for normality, and homoscedasticity, and analysis of variance for the full regression models were done. Statistical significance was considered at p-value <0.05.

#### **Results:**

The students' age ranged between 6 and 12 years with slightly more males (54.5%) as shown in **Table (1)**. The majority was having more than one sibling and living with both parents, and none was firstborn. More than half of the fathers were 40 years age or older (53.6%), and of the mothers were 35 years age or older (54.5%). More fathers were illiterate (26.4%) compared with the mothers (53.2%). The majority of the mothers were housewives (82.6%).

As regards students' socio-economic characteristics, **Table (2)** indicates that the majority were having families with sufficient income (83.6%), but lived in houses with crowding index of 2 or more persons per room (72.7%). While all had TV sets and the majority had dishes (93.6%), only 21.8% were having computers at home. Approximately two-thirds or more reported having hobbies (62.7%), practicing physical exercise (71.8%), and having 4 or more friends (63.6%). As regards aggressive behavior before the intervention, the highest type was against others (75.5%). Overall, slightly more than two thirds of them had total aggressive behavior (68.2%).

**Table (3):** Demonstrates statistically significant associations between students' pre-intervention aggressive behavior and their age ( $p < 0.001$ ) and gender ( $p = 0.004$ ). It is evident that higher percentages of students in the age category 10 or more years and of male gender were having total aggressive behavior compared with younger and female students. None of the other students or parents' characteristics had a statistically significant relation with aggressive behavior.

**Table (4):** Indicates that students' practice of exercise or hobbies, their having friends, and their home media had no statistically significant relation to their aggressive behavior.

As illustrated in **Table (5)** the implementation of the study intervention led to statistically significant improvements in students' aggressive behavior ( $p < 0.001$ ). This was evident in all types of behavior. As shown in the table, 68.2% of the students had total aggressive behavior before the intervention. This dropped to 1 (0.9%) student in the post-intervention phase, and none in the follow-up phase.

In multivariate analysis (**Table 6**), the implementation of the study intervention is the only negative statistically significant independent predictor of the score of aggressive behavior throughout the study intervention. It has the most important influence on this score as indicated by its standardized coefficient. Meanwhile, the model indicates that the aggression score increased with student's age, number of siblings, having hobbies, and having more home media. In other words, older students with more siblings, more home media, and having hobbies had less benefit from the intervention. The model explains 54% of the variation in the aggression score as indicated by the value of the r-square.

#### **Discussion:**

The present study revealed generally high prevalence of aggressive behaviors among primary school students. The implementation of the study intervention was associated with significant improvements in these student's aggressive behaviors, which lead to acceptance of the research hypothesis of the study.

According to the present study findings, more than two thirds of the students have total aggressive behavior. The aggressive behavior was in all aspects such as against self, properties, and others. This last one

was the most common where among every four students three have aggressive behavior against others. Similar findings were revealed in a study in the United Kingdom, although with lower prevalence of aggressive behavior.<sup>(20)</sup>

As regards the factors influencing students' aggressive behavior, the current study identified increasing age and male gender as the variables associated with increased total aggressive behavior. The increased aggression with age in this early phase of adolescence may be attributed to the important physical and psychological changes in this phase, which may lead to more risky and violent behaviors. Meanwhile, with advancing age and more maturation in later adolescence, there is a tendency to lower aggressive behavior as shown in a study of middle adolescents in Greece<sup>(21)</sup>. On the same line, Vaillancourt et al.<sup>(22)</sup> reported that girls' use of indirect aggression increased with age.

As for the relation between aggressive behavior and gender, the present study demonstrated significantly higher aggression among male students. This is quite plausible given the gender differences in addition to the societal norms, which may be more accepting of such behavior from boys compared with girls. This study finding is also in agreement with a recent study in Germany where boys had higher scores in aggression forms, especially the physical aggression, compared with girls<sup>(23)</sup>. These authors also showed that and the normative approval of physical aggression predicted physically aggressive behavior, which supports our explanation of this gender difference. In congruence with this, Çetin et al.<sup>(24)</sup> mentioned that the cultures of violence and beliefs about the appropriateness of retaliation can contribute to aggressive and violent behavior.

The present study could not reveal any significant association between students' socio-economic

characteristics and their aggressive behavior. The finding is in disagreement with previous studies which demonstrated that poverty and low socio-economic levels increased aggression among adolescents<sup>(25-27)</sup>. However, other studies found that poverty is not necessarily a predictor of aggressive behavior, and social support can mitigate its deleterious effects.<sup>(28-29)</sup> Meanwhile, the lack of significant associations in the current study might be due to the homogeneity of the study sample regarding the socio-economic variables, thus obscuring any significant differences.

The implementation of the present study intervention led to significant improvement in students' anger scores, and this was confirmed through multivariate analysis. This indicates that the participation of these children in collective games and sporting activities can improve their aggressive behavior through their engagement in teamwork and the dissipation of their energy in competitive activities. The findings are in agreement with Tkacz et al.<sup>(30)</sup> whose study demonstrated a similar decrease in the anger scores after applying the exercise program, but not in the control group. However, their study was selective being applied to overweight children, and the authors recommended replicating it on normal children. On the same line, Erden<sup>(31)</sup> revealed a positive impact of physical exercise on disruptive aggression scores and attributed it to higher assertiveness. Similarly, Trudeau and Shephard<sup>(32)</sup> showed that exercise improves children's concentration and social functioning in class, and this was particularly more evident in those with disruptive behaviors. Additionally, in-class physical activity breaks improved children's performance in the tasks following these activities.<sup>(33-34)</sup>

Nevertheless, in disagreement with the present study main finding regarding the effectiveness of exercise regimen on aggressive behavior, other studies could not show any significant difference between high school

students who joined sports actively and those who did not join it actively for their aggression levels.<sup>(35-37)</sup> However, these studies used cross-sectional rather than intervention research designs, and thus could have the associated bias of lack of temporal relationship. Moreover, the different age groups in the different studies and the use of various sport types and regimens, e.g. team versus individual, could explain the differences among studies as clarified by Çetin et al.<sup>(24)</sup>. Moreover, the longer-term effects of such interventions need to be tested as Mahar et al.<sup>(38)</sup> suggested.

According to the present study, the students having more home media had less benefit from the intervention. This might be explained by the negative influence of such media on students' behavior as children in this phase of early adolescence may be attracted to more violent programs and games that may give them the impression that moderately aggressive children are viewed as popular and attractive role models.<sup>(39-40)</sup> In agreement with this current study finding, Bushman and Huesmann<sup>(41)</sup> and Huesmann and Kirwil<sup>(42)</sup> argued that violent media stimulate aggression by influencing children to mimic what they see and desensitizing viewers to violence. Moreover, Maier and Gentile<sup>(43)</sup> claimed that perceptual, cognitive, and emotional responses can be predicted from repeated exposure to media violence.

### Conclusion:

The study findings lead to the conclusion that aggressive behaviors are prevalent among primary school students, and this can be ameliorated through application of sporting exercises and collective games.

### Recommendations:

The developed intervention should be implemented on a wider scale in other primary schools to confirm this finding. Randomized controlled trials are needed for unbiased assessment of the

effectiveness of the program, with longer follow-up studies to evaluate its long-term effects.

**Table (1): Socio-demographic characteristics of students in the study sample (n=110)**

<b>Socio-demographic characteristics of students</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age:</b>		
▪ <10	54	49.1
▪ 10+	56	50.9
Range	6.0-12.0	
Mean±SD	9.1±1.9	
<b>Gender:</b>		
▪ Male	60	54.5
▪ Female	50	45.5
<b>No. of siblings:</b>		
▪ 1	5	4.5
▪ 2-3	74	67.3
▪ 4+	51	28.2
Range	1-6	
Mean±SD	3.1±1.1	
Median	3	
<b>Birth order:</b>		
▪ 2	39	35.5
▪ 3	37	33.6
▪ 4+	34	30.9
<b>Live with both parents</b>	103	93.6
<b>Father age:</b>		
▪ <40	51	46.4
▪ 40+	59	53.6
Range	31.0-52.0	
Mean±SD	40.6±5.0	
<b>Father education:</b>		
▪ Illiterate	29	26.4
▪ Basic/intermediate	68	61.8
▪ University	13	11.8
<b>Father job:</b>		
▪ Clerical	63	57.3
▪ Manual work	47	42.7
<b>Mother age:</b>		
▪ <35	50	45.5
▪ 35+	60	54.5
Range	26.0-50.0	
Mean±SD	35.1±4.5	
<b>Mother education:</b>		
▪ Illiterate	58	53.2
▪ Basic/intermediate	47	43.1
▪ University	4	3.7
<b>Mother job:</b>		
▪ Working	19	17.4
▪ Housewife	90	82.6



**Table (2): Socio-economic characteristics and pre-intervention aggressive behavior among students in the study sample (n=110)**

<b>Socio-economic characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Crowding index:</b>		
▪ <2	30	27.3
▪ 2+	80	72.7
<b>Income:</b>		
▪ Insufficient	18	16.4
▪ Sufficient	92	83.6
<b>Home media:</b>		
▪ TV	110	100.0
▪ Video	2	1.8
▪ Dish	103	93.6
▪ Computer	24	21.8
<b>Total media:</b>		
Range		1-4
Mean±SD		2.2±0.4
Median		2
<b>Have hobbies</b>	69	62.7
<b>Practice physical exercise</b>	79	71.8
<b>No. of friends:</b>		
▪ 0	3	2.7
▪ 1	6	5.5
▪ 2-3	31	28.2
▪ 4+	70	63.6
<b>Aggressive (sometimes/always):</b>		
▪ Against self	63	57.3
▪ Against others	83	75.5
▪ Against properties	63	57.3
<b>Total aggression</b>	75	68.2

**Table (3): Relation between students' pre-intervention aggressive behavior and their socio-demographic characteristics**

Socio-demographic characteristics	Aggressive behavior				X <sup>2</sup> test	p-value
	Yes		No			
	No.	%	No.	%		
<b>Age:</b>						
▪ <10	26	48.1	28	51.9		
▪ 10+	49	87.5	7	12.5	19.62	<0.001*
<b>Gender:</b>						
▪ Male	48	80.0	12	20.0		
▪ Female	27	54.0	23	46.0	8.50	0.004*
<b>No. of siblings:</b>						
▪ 1	4	80.0	1	20.0		
▪ 2-3	47	63.5	27	36.5	2.28	0.32
▪ 4+	24	77.4	7	22.6		
<b>Birth order:</b>						
▪ 2	24	61.5	15	38.5		
▪ 3	27	73.0	10	27.0	1.28	0.53
▪ 4+	24	70.6	10	29.4		
<b>Live with:</b>						
▪ Both parents	70	68.0	33	32.0		
▪ One parent	5	71.4	2	28.6	Fisher	1.00
<b>Father age:</b>						
▪ <40	34	66.7	17	33.3		
▪ 40+	14	69.5	18	30.5	0.10	0.75
<b>Father education:</b>						
▪ Illiterate	20	69.0	9	31.0		
▪ Basic/intermediate	47	69.1	21	30.9	--	--
▪ University	8	61.5	5	38.5		
<b>Father job:</b>						
▪ Clerical	43	68.3	20	31.7		
▪ Manual work	32	68.1	15	31.9	0.00	0.98
<b>Mother age:</b>						
▪ <35	33	66.0	17	34.0		
▪ 35+	42	70.0	18	30.0	0.20	0.65
<b>Mother education:</b>						
▪ Illiterate	37	63.8	21	36.2		
▪ Basic/intermediate	35	74.5	12	25.5	--	--
▪ University	2	50.0	2	50.0		
<b>Mother job:</b>						
▪ Working	14	73.7	5	26.3		
▪ Housewife	60	66.7	30	33.3	0.35	0.55
<b>Income:</b>						
▪ Insufficient	11	61.1	7	38.9		
▪ Sufficient	64	69.6	28	30.4	0.50	0.48

(\*) Statistically significant at  $p < 0.05$ 

(-- ) Test result not valid

**Table (4): Relation between students' pre-intervention aggressive behavior and their social relations, habits, and home media**

Social relations, habits, and home media	Aggressive behavior				X <sup>2</sup> test	p-value
	Yes		No			
	No.	%	No.	%		
<b>Practice exercise:</b>						
▪ No	17	54.8	14	45.2		
▪ Yes	58	73.4	21	26.6	3.54	0.06
<b>Hobbies:</b>						
▪ No	27	65.9	14	34.1		
▪ Yes	48	69.6	21	30.4	0.16	0.69
<b>Have friends:</b>						
▪ No	1	33.3	2	66.7		
▪ Yes	74	69.2	33	30.8	Fisher	0.24
<b>TV:</b>						
▪ No	0	0.0	0	0.0		
▪ Yes	75	68.2	35	31.8	0.00	1.00
<b>Video:</b>						
▪ No	74	68.5	34	31.5		
▪ Yes	1	50.0	1	50.0	Fisher	0.54
<b>Dish:</b>						
▪ No	5	71.4	2	28.6		
▪ Yes	70	68.0	33	32.0	Fisher	1.00
<b>Computer:</b>						
▪ No	57	66.3	29	33.7		
▪ Yes	18	75.0	6	25.0	0.66	0.42

**Table (5): Aggressive behavior among students in the study sample throughout the intervention**

Aggression (sometimes/always):	Time						X <sup>2</sup> (P) Pre-post	X <sup>2</sup> (P) Pre-FU
	Pre (n=110)		Post (n=110)		FU (n=110)			
	No.	%	No.	%	No.	%		
Against self	63	57.3	4	3.6	2	1.8	74.71(<0.001*)	81.25(<0.001*)
Against others	83	75.5	2	1.8	2	1.8	125.79(<0.001*)	125.79(<0.001*)
Against properties	63	57.3	2	1.8	0	0.0	81.25(<0.001*)	88.28(<0.001*)
Total aggression:	75	68.2	1	0.9	0	0.0	110.08(<0.001*)	113.79(<0.001*)

(\*) Statistically significant at  $p < 0.05$

**Table (6): Best fitting multiple linear regression model for the total aggression score throughout intervention**

Items	Un standardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std.Error				Lower	Upper
▪ Constant	0.72	0.16		4.57	<0.001	0.41	1.02
▪ Intervention	-0.36	0.02	-0.70	-18.78	<0.001	-0.40	-0.32
▪ Age	0.04	0.01	0.20	4.96	<0.001	0.03	0.06
▪ No. of siblings	0.05	0.02	0.12	2.85	0.005	0.02	0.08
▪ Have hobbies	0.04	0.02	0.09	2.25	0.025	0.01	0.08
▪ No of home media	0.06	0.03	0.08	1.98	0.049	0.00	0.12

*R-square=0.54*

*Model ANOVA: F=65.55, p<0.001*

*Variables entered and excluded: sex, birth order, parents' age, education, job, living with family, crowding index, income, social relations*

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