
Factors Affecting Scholastic Achievement Among School Children in a Slum Area

Amany Sobhy Sorour

Community Health Nursing Department, Faculty of Nursing, Zagazig University, Cairo, Egypt

Email address:

dr.amany.sorour@gmail.com

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Abstract: Slums areas present major social and health disadvantages to children, which may affect their school performance. The aim of this study was to determine the factors affecting scholastic achievement among adolescent children in a slum area. This cross-sectional study was carried out in an urban slum area (Manshiat Naser) in Cairo on a multistage stratified cluster sample of 200 preparatory school children residing in the area technique was used. The data collection tool was an interview questionnaire form covering socio-demographic characteristics, school achievement, and selected domains of the Global Risk Assessment Device (GRAD) scale. The fieldwork was from the beginning of October to the end of December 2015. The results showed that 18% of children had academic failure. Statistically significant relations were revealed between school achievement and school children's gender ($p=0.001$), age ($p=0.03$), grade ($p=0.001$), father education ($p=0.02$), mother age ($p=0.19$), residence ($p=0.01$), and income ($p < 0.001$). School achievement was also related to the educational ($p < 0.001$), accountability ($p < 0.001$), and health care ($p < 0.001$) factors of GRAD. In multivariate analysis, the risk factors predicting academic failure were a higher school grade, and higher scores of educational, accountability, and health care factors. In conclusion, the school performance of school children in slum area is most influenced by accountability, educational and health care factors, and higher school grade. Intervention studies are needed to investigate the effectiveness of school-based programs addressing these identified factors in improving school performance among these adolescents.

Keywords: Scholastic Achievement, School Children, Slum, Psychosocial

1. Introduction

The challenge of slums is a global concern and a growing one. The rapid urbanization in the last century has been accompanied by tremendous growth of slum areas. Currently, nearly one third of the developing world population and more than 60% of urban populations in the least developed countries live in slums, including hundreds of millions of children [1]. The world population is expected to increase by 2 billion by 2030 [2]. Approximately half of the population increase is estimated to be in urban slums [3].

The United Nations (UN) operationally defines slums as having at least one of five characteristics: insecure residential status, poor structural quality of housing, overcrowding, inadequate access to safe water, and inadequate access to sanitation and other infrastructure [4]. Slums have also been defined as diverse sets of communities, located centrally and

in the periphery of cities, on floodplains and hillsides, poorly constructed and ranging from thousands to millions of residents [5]. In addition to the UN legal and physical definition, the conditions of slum life are characterized by extreme poverty and exceedingly substandard living conditions. They are also areas of broader social disadvantage to children and their families with limited access to basic healthcare, schools and important municipal services. Social problems commonly affect these communities [6].

Slums are areas constitute broad social and health disadvantages to children due to extreme poverty, overcrowding, poor water supply and sanitation, substandard housing, in addition to limited access to basic health and education services, and other hardships [1]. Those children are more likely to not attend school, attend sporadically, or not complete school. They are also vulnerable to being excluded from education for reasons such as low income,

lack of self-esteem, delayed achievement in education due to non- or sporadic attendance, and lack of literacy and/or education among their parents [7].

Research in recent years has drawn attention to the fact that significant numbers of children and adults are failing to access educational opportunities. Internationally, 61 million children and 74 million adolescents are out of school, most of them in Sub-Saharan Africa and South Asia [8]. Moreover, 793 million people do not have basic literacy skills and current trends indicate that the number of children not in school in 2015 may be higher than it was in 2012 [7]. Of additional concern is the fact that those who are accessing education are often either not learning effectively or dropping out before completing primary education. Thus, in many countries, few children progress from primary to secondary schools. Most data indicates that children from economically poorer families are significantly more likely to drop out of secondary school even if they do enroll, reinforcing the link between poverty and lack of access to education [9].

Aim of the study: The aim of this study was to determine the factors affecting scholastic achievement among school children in a slum area.

2. Subjects and Methods

2.1. Research Setting and Design

The study was carried out in an urban slum area (Manshiat Naser) in Cairo. A cross-sectional design was used to achieve the aim of the study.

2.2. Subjects

The study population consisted of preparatory school children residing in the study setting during the time of data collection. Any school child permanently residing in this area and attending one of its schools was eligible for inclusion in the study. The sample size was calculated to detect a medium effect size of the mean differences in the scores of the factors probably affecting scholastic achievement related to substance abuse, health services, accountability, sociability, and education between success and failure students. A total sample of 200 school children was required to identify this difference at 95% level of confidence and 80% power for unequal groups [10].

In order to achieve the required sample size, a multistage stratified cluster sampling technique was used. Thus, schools were stratified into schools for boys and schools for girls, and the classes were stratified into three according to grade levels. Two schools were randomly selected, one for boys and one for girls. Then, three classes were randomly selected from each school, one from each of the three grades. One class was randomly selected from each of the three grades for boys and girls. All available school children in the selected classes were recruited in the study sample.

2.3. Data Collection Tool

The researcher prepared an interview questionnaire form

for data collection. Its first part covered respondent's socio-demographic characteristics as age, gender, school grade, school achievement, residence, parents' education, job, and income. The second part consisted selected domains of the Global Risk Assessment Device (GRAD) scale, version 1.0 developed by Gavazzi *et al.* [11]. The domains of risks selected to determine the factors possibly affecting scholastic achievement were substance abuse (13 items such as does the youth use marijuana?, does the youth smokes or chews tobacco regularly?, does the youth sniff glue, aerosol sprays, or other inhalants?), health services (5 items such as does the youth have poor nutrition or hunger-related problems?, does the youth have problems with their weight (either over or under?), accountability (7 items such as does the youth fail to take responsibility for their actions?, does the youth seem to not feel guilty when caught doing something wrong?, does the youth blame others for their own mistakes?), sociability (7 items such as does the youth seem to have an excessive sense of self-worth?, does the youth seem to think they are better or more deserving than others?, and education (13 items such as does the youth have difficulty getting to school/or staying in school for the entire day? does the youth miss school frequently due to family responsibilities?).

The response to each item is on a 3-point Likert scale "No/Never," "Yes/a couple of times," and "Yes/a lot" depending on how much each item applies to respondent's life. These are scored "0" to "2" respectively, so that a higher score reflects a greater risk in each domain. The item scores of each domain are totaled by simple summation and divided by the number of its items to compute a risk score for each domain ranging between 0 and 2. Evidence of the psychometric properties of the GRAD has been demonstrated in studies that demonstrated high internal reliability, predictive validity [11], and gender and race/ethnicity differences [12].

2.4. Pilot Study

This was carried out on 20 children from different classes to test the feasibility of the study and the clarity of the questionnaire, and to estimate the time needed for data collection. Since some modifications were done in the tool in the form of re-wording and re-phrasing, those 20 children who participated in the pilot study were not included in the main study sample.

The pilot study also served to assess the reliability of the scales used through assessing their internal consistency. The scales showed good reliability with Cronbach alpha coefficients 0.83 for educational factors, 0.78 for substance abuse, 0.54 for sociability, 0.69 for accountability, and 0.60 for health care.

2.5. Fieldwork

The researcher obtained an official permission letter for data collection from the CAPMAS security department directed to the Department of Education at Manshiat Naser Zone. Two schools were selected randomly one for girls and

one for boys. The researcher met with the headmaster of each school to explain the aim and procedures, to set the time schedule for data collection, and to arrange for obtaining parents' consents and students' assents. Eligible students were met in the presence of a social worker after explaining to them the aim of the study. The researcher then started to interview them in small groups of 3 to 5 using the questionnaire form. The interview was started by providing instructions to the students on filling the form; then the researcher read each statement and gave the students the chance to respond to each one. The process took approximately 40-50 minutes. Two days were scheduled each week for data collection from schools. The duration of data collection took about three months from the beginning of October to the end of December 2015.

2.6. Ethical Considerations

Informed consents were obtained from the parents of children through their schools or literacy classes and assents from the children themselves. The form explained the study aim in a simple and clear manner to be understood by common people. No harmful maneuvers were performed or used, and no foreseen hazards were anticipated from conducting the study on participants. They were informed about their right to withdraw from the study at any time without giving any reason. Data were considered confidential and not to be used outside this study without their approval.

2.7. Statistical Analysis

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the scales through 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. pearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of academic failure, multiple logistic regression analysis was used. Statistical significance was considered at p-value < 0.05.

3. Results

Table 1 shows that the age of school children ranged between 13 and 15 years, with more males (56%), and 44% from the second preparatory grade. Slightly less than one-fifth of them (18%) experienced academic failure. As regards their parents, the mean ages of the fathers and mothers were 42.9 and 36.9 years, with a majority having no formal education, 84.8% and 93% respectively. Approximately

three-fourth of the fathers were manual workers (73.1%). The majority of the families were from rural areas (70.5%), and 52.5% had insufficient income.

Table 1. Socio-demographic and educational characteristics of school children in the study sample (n=200).

Characteristics	Frequency	Percent
Gender:		
Male	112	56.0
Female	88	44.0
Age:		
13	56	28.0
14	83	41.5
15	61	30.5
Range	13.0-15.0	
Mean±SD	14.0±0.8	
Median	14.0	
School grade:		
1	63	31.5
2	88	44.0
3	49	24.5
School achievement:		
Success	164	82.0
Failure	36	18.0
Father age:		
< 40	39	19.5
40+	161	80.5
Range	30.0-65.0	
Mean±SD	42.9±6.2	
Median	41.00	
Father education:		
None	167	84.8
Educated	30	15.2
Father job:		
Employee	38	19.3
Manual worker	144	73.1
Retired/non	15	7.6
Mother age:		
< 35	67	33.5
35+	133	66.5
Range	22.0-60.0	
Mean±SD	36.9±5.9	
Median	37.00	
Mother education:		
None	185	93.0
Educated	14	7.0
Residence:		
Rural	159	79.5
Urban	41	20.5
Income:		
Insufficient	105	52.5
Sufficient	95	47.5

Table 2 demonstrates statistically significant relations between school achievement and school children's gender (p=0.001), age (p=0.03), grade (p=0.001), father education (p=0.02), mother age (p=0.19), residence (p=0.01), and income (p < 0.001). As evident from the table, the failed school children had higher percentages of males, older age, higher school grade, non-educated fathers, older age mothers,

with rural residence, and insufficient income.

Concerning the psychosocial factors and their relation to school achievement, Table 3 demonstrates statistically significant associations with the educational ($p < 0.001$), accountability ($p < 0.001$), and health care ($p < 0.001$) factors. It can be noticed that these three factors were higher among failed school children. Meanwhile, the substance abuse and sociability factors were not significantly different in success and failure school children.

Table 2. Relation between school achievement and school children's characteristics.

characteristics	School achievement				X ² test	p-value
	Success		Failure			
	No.	%	No.	%		
Gender:						
Male	83	50.6	29	80.6	10.74	0.001*
Female	81	49.4	7	19.4		
Age:						
13	51	31.1	5	13.9	7.22	0.03*
14	69	42.1	14	38.9		
15	44	26.8	17	47.2		
School grade:						
1	58	35.4	5	13.9	13.84	0.001*
2	74	45.1	14	38.9		
3	32	19.5	17	47.2		
Father age:						
<40	34	20.7	5	13.9	0.88	0.35
40+	130	79.3	31	86.1		
Father education:						
None	132	82.0	35	97.2	5.29	0.02*
Educated	29	18.0	1	2.8		
Father job:						
Employee	34	21.1	4	11.1	--	--
Manual worker	120	74.5	24	66.7		
Retired/non	7	4.3	8	22.2		
Mother age:						
<35	61	37.2	6	16.7	5.584	0.019*
35+	103	62.8	39	83.3		

Table 3. Relation between total factors and school achievement among school children in the study sample.

Factors	School achievement				X ² test	p-value
	Success		Failure			
	No.	%	No.	%		
Educational factors:						
High	28	17.1	34	94.4	82.62	<0.001*
Low	136	82.9	2	5.6		
Substance abuse:						
High	5	3.0	0	0.0	Fisher	0.59
Low	159	97.0	36	100.0		
Sociability:						
High	18	11.0	1	2.8	Fisher	0.21
Low	146	89.0	35	97.2		
Accountability:						
High	32	19.5	30	83.3	56.21	<0.001*
Low	132	80.5	6	16.7		
Health care:						
High	59	36.0	33	91.7	36.86	<0.001*
Low	105	64.0	3	8.3		

(*) Statistically significant at $p < 0.05$

characteristics	School achievement				X ² test	p-value
	Success		Failure			
	No.	%	No.	%		
Mother education:						
None	149	91.4	36	100.0	Fisher	0.08
Educated	14	8.6	0	0.0		
Residence:						
Rural	125	76.2	34	94.4	6.02	0.01*
Urban	39	23.8	2	5.6		
Income:						
Insufficient	74	45.1	31	86.1	19.89	<0.001*
Sufficient	90	54.9	5	13.9		

(*) Statistically significant at $p < 0.05$ (--) Test result not valid

Table 4 illustrates statistically significant weak moderate positive correlations among the scores of the various groups of psychosocial factors influencing school achievement. The only exception was the sociability factor, which was not correlated to any of the other factors. It is noticed that the strongest correlation was between educational and health care factors ($r=0.552$), while the weakest was between accountability and substance abuse ($r=0.211$).

As regards the correlations between the various psychosocial factors and schoolchildren's characteristics, Table 5 indicates that the educational, substance abuse, and health care factors had negative correlations with the level of father and mother education. Meanwhile, substance abuse had positive correlations with school child's age, school grade, and mother age. The sociability and accountability factors had no significant correlations with any of the characteristics of school children.

In multivariate analysis (Table 6), the risk factors predicting academic failure were a higher school grade, and higher scores of educational, accountability, and health care factors. It is evident that the educational factors are the most influential (Odds Ratio [OR] 186.52), followed by the accountability factors (OR 37.34).

Table 4. Correlation matrix of various domains scores.

Factors	Spearman's rank correlation coefficient				
	Educational	Substance Abuse	Sociability	Accountability	Health care
Educational					
Substance abuse	.418**				
Sociability	0.00	-0.04			
Accountability	.471**	.211**	0.12		
Health care	.552**	.235**	0.06	.529**	

(**) Statistically significant at $p < 0.01$ **Table 5.** Correlation matrix of various domains scores with students' characteristics.

Characteristics	Spearman's rank correlation coefficient				
	Educational	Substance Abuse	Sociability	Accountability	Health care
Age	0.08	.286**	0.02	0.10	0.03
Grade	0.01	.250**	0.05	0.11	0.04
Father age	-0.01	0.10	-0.03	-0.02	0.00
Father education	-.203**	-.192**	-0.02	-0.08	-.143*
Mother age	0.05	.183**	-0.02	0.06	0.02
Mother education	-.274**	-.173*	-0.10	-0.11	-.201**

(*) Statistically significant at $p < 0.05$ (**) Statistically significant at $p < 0.01$ **Table 6.** Best fitting multiple logistic regression model for school failure.

Factors	Wald	Df	P	OR	9 5.0% CI for OR	
					Upper	Lower
Constant	23.308	1	< 0.001	0.00		
Grade	10.900	1	0.001	7.59	2.28	25.27
Educational factors score	18.582	1	< 0.001	186.52	17.31	2009.83
Accountability factors score	16.700	1	< 0.001	37.34	6.58	211.97
Health care factors score	4.134	1	.042	6.23	1.07	36.33
Nagelkerke R Square: 0.82						
Hosmer and Lemeshow Test: $p=0.196$						
Omnibus Tests of Model Coefficients: $p < 0.001$						
Variables entered and excluded: age, gender, parents' age, education, and job, family residence, income, drug abuse and sociability factors						

4. Discussion

The examination of factors associated with educational achievements is a high interesting area of research in educational systems. The present study attempted to identify these factors in a specific population of school children, those residing in a slum area. The results identified important personal as well as family, psychological and environmental factors that had significant associations with their scholastic achievement.

The present study results revealed that the educational, accountability, and health care risk factors had a significant association with academic failure. The multivariate analysis confirmed that these three factors were the psychosocial predictors of academic failure; the educational risk factors being the most influential. This is plausible since factors such as the educational system and student's compliance with rules and with regular attendance are expected to be of prime importance in achieving academic success. In congruence with this, *Reimer and Smink* [13] found that the students with high absenteeism are significantly more involved with disruptive classroom behaviors such as bullies/bullied, disrespect for teacher, and affiliation with gangs. Such behaviors would certainly have a negative impact on their academic achievement. Moreover, a harsh school discipline was reported

to be associated with poor academic performance among school children in South Africa and Malawi [14].

In the present study, the accountability risk factors came second as predictor of school failure following the educational risk factors. The findings reflect the importance of feeling responsible and committed in improving school performance, especially in the poor school environment such as in slums. In line with this, *Özenl* [15] demonstrated that a positive school climate improves student achievement with a more sense of belonging. Additionally learning and behaving responsibly in the classroom are causally related. Thus, irresponsible behavior can result in classroom disorder or poor interpersonal relationships and tends to place children at risk for academic failure. Thus, student's accountability can be instrumental in the acquisition of knowledge and the development of cognitive abilities. On the same line, a recent study in Spain identified a significant association between students' feeling of lack of autonomy and poor school performance [16].

The effect of health care risk factors are quite expected given the close relationship between good nutrition and school performance. Thus, a deficient health care system, such as it is the case in slum areas, is would certainly have a negative impact of scholastic achievement. In agreement with this, *Lowry* [17] mentioned that healthy students are better on all levels of academic achievement. A student who is

malnourished, unable to hear and see adequately, or living with an unmanaged health condition may have more problems concentrating in class and miss more school days than a healthy one. Health issues may thus impair students' ability to fully participate in school. This is also more aggravated by unhealthy school settings that do not allow adequate access to basics like physical activity, health services, quality indoor air conditions, healthy food and drinkable water. In this respect studies have demonstrated significant associations between poor health [18], as well as exposure to environmental pollutants such as lead in studies in the United States (*Evens et al.* [19] and in Sweden (*Skerfving et al.* [20]), which may be more likely in slum areas, and poor school performance among adolescent students. Hence, *García-Vázquez* [21] in a study in Spain showed the positive impact of a good school health program on students' academic achievement.

Unexpectedly, the substance abuse risk factors showed no significant difference between successful and failed school children. This might have more than one explanation. The first is the denial and under-reporting of substance abuse for fear or shame. The second is the high prevalence of this problem in slum areas. These two reasons may mask any significant association between substance abuse risk factors and scholastic achievement. In congruence with this, *Hollar and Moore* clarified [22] that although substance abuse is a major problem among adolescents, studies rarely investigate the relationships between substance abuse educational achievement because of denial reasons. Hence, attempts were done to develop valid tools to diagnose substance abuse among adolescents *Couwenbergh et al.* [23]. Meanwhile, some researchers suggested that substance abuse is an outcome rather than a cause of poor school performance [24; 25].

According to the present study results, the sociability risk factors were not significantly different in success and failure school children. This might be attributed to the fact that such risk factors related to low self-esteem, easily irritability, and feeling of inferiority are highly prevalent in slum areas. Since the majority of children suffer these negative feelings, they could not differentiate success from failure students. Hence, our results are incongruent with previous studies, which demonstrated that high self-esteem and good academic achievement and personal development are closely related [26; 27]. Moreover, *Maruyama et al.* [28] found that students who generally feel confident show better performance in all areas of their studies whereas those who demonstrate less confidence show low performance. The discrepancy with our results could be related to the different settings since the present study was carried out in a slum area where the sociability risk factors are highly prevalent.

Concerning the personal and family characteristics as factors possibly affecting school achievement in a slum area, the present study revealed that male gender, older age, and higher-grade students experienced significantly more academic failures. However, in multivariate analysis the only personal risk factor predicting academic failure was a higher school grade. This might be explained by the fact that as

students progress to higher school grades, especially male ones, they tend to gradually withdraw from education. This is associated with decrease in their school performance, ending up with academic failure. The findings are similar to those reported by *Bunketorp et al.* [29] in a study in Sweden, where girls had better academic achievements.

The family characteristics associated with a higher likelihood of academic failure in the current study were the fathers having no formal education, older age mothers, rural residence, and insufficient income. These factors indicating low socio-economic level often lead families to force their children to quit the school to work in order to help in family financial support. In agreement with this, *Ruijsbroek et al.* [30] in a study in the Netherlands demonstrated that parents' education and children's academic achievement are strongly positively related. Furthermore, a recent study in Brazil showed that low home environment resources is significantly associated with low academic success in primary school children [31]. Moreover, the school performance of children of affluent families was found significantly better compared with those of poor families in a study in Russia [32].

5. Conclusion and Recommendations

In conclusion, the school performance of school children in slum area is most influenced by accountability, educational and health care factors, in addition to higher school grade. The strong inter-relations among these domains should be taken into account in any trial to improve the educational system in schools. The substance abuse-related factors need to be revisited given the possibility of under-reporting. Intervention studies are needed to investigate the effectiveness of school-based programs addressing these identified factors in improving school performance among these adolescents.

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