



FACTORS AFFECTING THE ACADEMIC PERFORMANCE OF PRIMARY SCHOOL CHILDREN IN BASRAH CITY

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Article history:	Abstract:
<p>Received: June 1st 2022 Accepted: July 1st 2022 Published: August 6th 2022</p>	<p>Background: Over the past decade, issues of child development and behavior have moved into prominent position in the mid stream of general medical care. As a sequence of increased awareness of the interrelationship of educational and health factors, educational professionals and parents have increasingly turned to pediatricians, general practitioners and otolaryngologists among others to consultation when problems arise in child's learning or behaviour. This frequently takes the form of asking the physician to provide a simple etiology such as vision, hearing or speech problems, to explain the problem.</p> <p>Objective: The purpose of the study is:</p> <ol style="list-style-type: none">1. To study the factors which affect academic school performance of primary school children in Basrah.2. To identify factors affecting pupils' cognitive development (IQ). <p>Patients and Methods: This is a cross sectional study involving 272 primary school children. The study was carried out to determine factors that affect academic performance of primary school children and to identify the factors that affect pupil's cognitive development (IQ).</p> <p>Six schools in two socio-economically different areas in Basrah city centre were randomly chosen for the study. [15 schools from area 1 (Al-Manawi) and 30 schools from area 2 (Al-Kebbla)], then six schools (3 schools for boys and 3 schools for girls) were chosen randomly.</p> <p>All pupils in the sixth class were included in the study (143 boys and 129 girls). A special questionnaire form was filled for each child by his/her parents and each child was examined for visual acuity defects, height and weight measurement and IQ testing.</p> <p>Results: The results of the study showed a high failure rate among primary school children in both mid-year examination and mathematics (45.6% and 29% respectively) and males had lower academic performance than females. IQ test showed that females had a higher IQ than males (39.5% and 23.1% respectively).</p> <p>IQ of the child is highly associated with parental education. Furthermore, the study found a higher failure rate among children whose parents of low education.</p> <p>Kindergarten attendance had a positive effect on child school performance and school attendance is highly correlated to academic performance.</p> <p>Conclusion: The academic performance is affected by past medical history that children with chronic illnesses tend to have lower performance than those with out and the ability of a child to participate in the educational experience is at least partially dependant on good vision while there is no effect observed for family size, crowding index and birth order on how well the children perform in the school. IQ of the child is highly associated with parental education. Furthermore, the study found a higher failure rate among children whose parents of low education.</p>

Keywords: Academic Performance, school age, IQ test



INTRODUCTION

School age is regarded as the most important phase of childhood life during which the child enters the society and training system and emerges as a contributing member of the community. The primary grades hold the potential for starting children on a course of life long learning. If the child doesn't maintain adequate health, the benefits of education will be lost because of absenteeism or lack of attention due to ill health⁽¹⁾. Since school children represent investment of the society to the future, their health, wellbeing and academic development are essential requirements for such an investment to be fruitful⁽²⁾. It is necessary to ensure that the school environment is maintained at a high standard in order to safeguard the health of children and to provide them with a practical example of healthy living. The school environment contains both physical and psychosocial dimensions. The physical environment that is conducive to the health and safety of schoolchildren and the psychosocial environment includes the physical, emotional and social conditions that affect the well-being of students and staff⁽³⁾.

The role of the physician in the identification, assessment and development of individualized educational programs for all children is mandated. As a sequence of increased awareness of the interrelationship of educational and health factors, educational professionals and parents have increasingly turned to pediatricians, general practitioners and otolaryngologists among others to consultation when problems arise in child's learning or behavior. This frequently takes the form of asking the physician to provide a simple etiology such as vision, hearing or speech problems, to explain the problem⁽⁴⁾.

School age is a period during which the child is undergoing rapid physical and mental development. Children at this age are at special risk to physical injuries, infection and emotional problems, that is why special attention must be drawn to this age group in a community⁽⁵⁾.

Children are the future of the nation so safeguarding their health today will ensure their health tomorrow. Taking in consideration that primary health children represent 1/5th of the population of Basrah⁽⁶⁾

1.1. School Performance Problems

Learning disabilities (LD) are among the important causes of poor academic performance in school going children. Learning disabilities are developmental disorders that usually manifest during the period of normal education. These disabilities create a significant gap between the true potential and day to day performance of an individual⁽⁷⁾.

It is important to find the reason for child's poor performance, Children who do poorly at school

may be under a lot of stress and will develop different ways to cope with this stress. Some may externalize their feeling, which can lead to acting out and behavior problems or becoming the class clown. Other children will internalize their feeling and will develop almost daily complaints of headaches and stomachaches. So a thorough evaluation by an experienced professional is usually needed to correctly diagnose children with complex problems⁽⁸⁾. A child with school problems is at risk of developing a number of secondary problems⁽⁹⁾.

1.2. Factors which affecting School Performance

Most children with school problems do not have a single identifiable cause. It is usual to identify a number of factors that are likely to be contributing to a child's problem, the interaction of these factors which overtime leads to the dysfunction which presents as school learning difficulties⁽⁹⁾.

1.2.1. Sex: Several studies did not show significant differences on academic performance for males and females. In a study on the health status of primary school children in Basrah, males were found to have higher failure rate (23.2%) than females (13.4%)⁽¹⁰⁾.

1.2.2. Family Size and Birth Order: Finding of various studies have indicated contradictory results regarding family size and its relation to children performance. An Australian study examined the relationship between sib ship size (the number of children in a family) and birth order with measures of academic performance. The analysis suggested that significant association with children's school- related outcomes at different levels of siblings' variables and the result provided only partial support for sibling dilution theory⁽¹¹⁾.

While Ebrahim study in Basrah found that children of large family size (10⁺) had statistically significant higher failure rate than those of smaller family size⁽¹⁰⁾.

1.2.3. Socio-economic Factors :

Children from deprived socio-economic circumstances are at risk of school dysfunction; there are multiple factors responsible, including family disruption, sub-optimal medical care and nutrition, the lack of early stimulation, poor role models and low parental education and expectation. There are children in whom multiple environmental stresses seem to have a compounding effect in contributing to their school problems, poverty is associated with sub-optimal health, housing and attending schools which are disadvantaged in term of resources⁽⁹⁾.

Socio-economic status of the family has significant effects on academic performance of the children. The Basrah study found that



children of mothers with low education (up to primary schooling) had significantly higher failure rate (22.5%) than children of educated mothers; the failure rate was (11.2%) for those attained secondary schooling and (5.1%) for those attained higher education. The same was also true regarding the inverse relationship of father education and failure rate⁽¹⁰⁾.

1.2.4. Kindergarten Attendance

The transition to school is marked by dramatic changes at the individual and contextual levels during the development period commonly known as the (5-7years shift), children across cultures develop increasingly sophisticated cognitive and social capacities⁽¹²⁾.

Early education gives the children a competitive and social advantage and does increase reading and mathematics skills at school entry and helps advancing children's school readiness but it also boosts children's classroom behavioural problems and reduces their self-control⁽¹³⁾.

1.2.5. Past health status

Children who have had a serious illness and make an apparent normal recovery may have subsequent school problems which may affect a child's school functioning. The reasons are multiple by the condition itself, e.g. asthma, sickle cell anaemia, epilepsy,*etc* or its treatment and side effects of medications such as antihistamine, anticonvulsant.....*etc*. Also frequent absence from school because of illness episodes and hospitalization, low self confidence, self-esteem and motivation, perception of child by parents and teachers and difficulties with peer relationship. However, there are many children with chronic or disabling illness who do not appear to suffer any school problems and a number who in fact seem to be spurred on to later achievement as a result of their illness⁽⁹⁾.

1.2.6. Visual Problems

Normal vision is important for leading normal life and for good educational activities. Children with any form of visual problems which affect acuity or eye movements will be at risk of school dysfunction. Preschool children may suffer from impairment of vision due to different causes; many of these are preventable so vision screening of school children is of paramount importance, since detection of visual disorders at that age can save the eye from amblyopic eye (lazy eye), defined as reduced visual acuity without visible damage to the structure of the eye or the visual system⁽⁹⁾.

1.2.7. Nutritional Status

The health and nutrition of children is vitally important especially in the early years where

development and growth is rapid. Good nutrition in children is crucial for achieving universal primary education. It enhances readiness for school; increases school enrollment; reduces absenteeism and reduces dropout rates⁽¹⁴⁾.

There has been numerous studies of the factors that may limit children's cognitive development and their ability to participate fully in school education. In developing countries, these studies have focused on the effects of stunting, wasting, micronutrient deficiencies, and short-term hunger and helminthes infections. Deficiencies in cognition often occur with poverty and are associated with chronic malnutrition, micronutrient deficiencies, infections and lack of stimulation .As many of these factors occur together and often interact, establishing causality is difficult⁽¹⁴⁾.

1.2.8. Intelligence Quotient

An **intelligence quotient** or **IQ** is a score derived from a set of standardized tests developed to measure a person's cognitive abilities ("intelligence") in relation to their age group. An IQ test does not measure intelligence the way a ruler measures height (absolutely), but rather the way a race measures speed (relatively)⁽¹⁵⁾. For people living in the prevailing conditions of the developed world, IQ is highly heritable, and by adulthood the influence of family environment on IQ is undetectable. IQ test scores are correlated with measures of brain structure and function, as well as performance on simple tasks that anyone can complete within a few seconds⁽¹⁵⁾.

IQ is correlated with academic success; it can also predict important life outcomes such as job performance and socioeconomic advancement⁽¹⁵⁾.

1.3. Assessment of School Performance

Performance assessment, also known as alternative or authentic assessment, is a form of testing that requires students to perform a task rather than select an answer from a readymade list, so it requires that students actively develop their approaches to the task under defined conditions ,knowing that their work will be evaluated according to agreed –upon standards. This requirement distinguishes performance assessment from other forms of testing⁽²⁹⁾.

Performance assessment requires a greater expense of time, planning and thought from students and teachers. Users also need to pay close attention to technical and equity issues to ensure that the assessment is fair to all students. This is all more important as there has been very little research and development on performance assessment in the environment of a high states accountability system, when administrative and resource decisions are affected by measures of student's performance⁽²⁹⁾.



In recent years, however, a new approach to assessment has been gaining acceptance among early childhood and primary education. These new tools may have many benefits for example:

- They systematically document what children know and can do based on activities they engage in on daily basis in their classroom.
- They are flexible enough to allow teachers to evaluate each child's progress using information obtained from ongoing classroom interactions with materials and peers.
- They are a mean for improving instruction, allowing teachers to plan a comprehensive, developmentally oriented curriculum based on their knowledge of each child.
- They provide valuable, in-depth information for parents, administrators and other policy makers.
- They put responsibility for monitoring what children are learning __ and what teachers are teaching __ in the hands of teachers, where it belongs⁽³⁰⁾.

The primary method for evaluating the academic achievement of students in Texas public schools is a standardized test called the Texas Assessment of Academic Skills (TAAS). Although the TAAS test was originally designed to measure individual student's achievement, in recent years, the test have been used to evaluate groups of students as well as schools and school districts. TAAS results are also used to determine whether students should be allowed to graduate or not. It measures how well Texas students are faring academically in basis subjects such as mathematics, reading and writing⁽³¹⁾.

Patients and Methods: This is a cross sectional study involving 272 primary school children. The study was carried out to determine factors that affect academic performance of primary school children and to identify the factors that affect pupil's cognitive development (IQ).

Schools located in two socioeconomically different areas were identified [15 schools from area 1 (Al- Manawi) and 30 schools from area 2 (Al-Kebbla)]. Then six schools (3 schools for boys and 3 schools for girls) were chosen randomly from the list of the primary schools (298 schools) which was obtained from The Directorate General of Education in Basrah.

A special questionnaire form was designed for the purpose of the study, it consists of three sections, the first section includes socio-demographic variables related to the study population such as age, sex, birth order, family size, crowding index, father education and occupation, mother education and occupation in addition to the past medical and surgical

history or any chronic illness that thought to affect school performance, this part was filled by each pupil's family. The second section of the questionnaire form was filled by the researcher including school performance related information such as mid-year examination results, mathematics mark, school attendance and number of years of failure. The Third section was also filled by the researcher; it included information about the health status such as weight, height, visual defects and IQ.

Each school was visited first prior to the proper phase of data collection, all school managers were briefed about the objectives, nature and requirement of the data collection process. In the second visit, the following practical steps were undertaken:

- After a short brief talk about the study to the whole class, the questionnaire form was given to each pupil included in the sample to be filled by their parents or other family members.
- Body weight measurement: A balanced weight scale (uniscale) that reads to the nearest 0.1 kg. was used to measure the body weight. The scale was checked and calibrated daily before use. The weight was measured with minimum clothes possible and without shoes.
- Body height measurement: Height of the child was measured by a UNICEF somatometer which reads to the nearest 0.1cm. The child was asked to take off shoes and stand erect against a flat vertical surface with the right head scale.
- The visual acuity examination: This measurement was obtained by the use of Snellen chart with letter E. Each child was asked to take the standing position 6 meters away from the chart; each eye was tested separately by keeping one eye covered at a time while examining the other. The child was asked to read different directions of letter E. The visual acuity was measured at the last line that could be read clearly by the child.
- IQ testing: The choice of a proper test for determination of IQ is not an easy step that the chosen test must be characterized to be simple, easy applicable, non-verbal one and can give a clue about the measure of IQ, that's why Toni test was used for determination of their IQ. This test was done under supervision of a psychiatrist. The purpose and procedure of the test was explained to each class in detail. Then the special form and booklet of the test were given for each child included in the study and the time was free for answering of the 50 items included in the test. Each item contains a riddle to be solved by the pupil and answered by a letter in the proper place. Accordingly the IQ for each child was calculated⁽³³⁾.



- Another visit was done for collection of the filled questionnaire forms and for collection of the information in section two of the questionnaire from school record.

Analysis of the data was carried out using SPSS (Statistical Package for Social Science) version 11 and the results were presented as simple self explanatory tables. Chi-square test and logistic regression analysis were used for comparison. All P values less than 0.05 were considered statistically significant.

2.3. Definition of variables

- **Birth order:** The sample is grouped into 3 groups:

- 1(first)
- 2-4(second-fourth)
- 5+ (fifth and above)

- **Crowding index:** it was calculated by dividing the number of family members over number of bed rooms, in the present study the crowding index was grouped as:

- ≤ 4
- 5+

- **Father education:** as completed years of formal schooling. This was classified into four groups.

- ≤ 9 years
- 10-12 years
- 13+ years

- **Father occupation:** This is classified into five groups.

- Professional: includes doctors, engineers, lawyers, teachers and pharmacists.
- Governmental employees.
- Self employed.
- Skilled worker: includes carpenter, driver and ironsmith.
- Others: includes retired and unemployed.

- **Mother education:** The same as father education.

- **Mother occupation:** grouped as:
 - Housewife
 - Working

- **Child was living with :**
 - Both parents.
 - Others (with only one parent or with relatives).

- **Kindergarten attendance:**
 - Yes
 - No

- **History of chronic diseases:** such as sickle cell anaemia, Bronchial asthma or others.
 - Yes
 - No

- **History of previous hospitalization:**

- Yes
- No

- **School attendance**(Number of days of absence): this was divided into:

- 0 (good)
- 1-6 (moderate)
- 7+ (bad)

- **Mathematics mark:**

- ≥ 80
- 60-79
- 40-59
- ≤ 40

- **Mid-year examination result:**

- ≥ 90 (excellent)
- 70-89 (very good)
- 50-69 (fair)
- < 50 (failed)

- **For those who failed in the mid-year exam (no. of subjects):**

- ≤ 2
- 3-5
- 6+

- **Number of years of failure:**

- 0 (no failure)
- 1 year
- 2years
- 3 years

- **BMI (Body Mass Index):** It's used for the evaluation of nutritional status of the children and it was calculated by the following formula $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m}^2\text{)}$. The study sample was divided into three groups.

- Normal weight: whose BMI lied between 3rd and 97th centile (Appendix ΠΙ) ⁽³⁴⁾.
- Overweight: whose BMI lied above 97th centile.
- Underweight: whose BMI lied below 3rd centile.

- **Visual acuity:** The result of examination was classified into the following groups. - Normal -6/6 in both eyes.

- Borderline -6/9 in one or both eyes
- Unilateral defect -6/6 or 6/9 in the better one and 6/12 or worse in the other eye.
- Bilateral defect - 6/12 or worse in both eyes.

- **IQ:** The study sample was classified into three groups :

- High IQ includes those with the highest 30%of IQ in the study sample.



-Low IQ includes those with the lowest 30%.

- Average IQ in between the two groups.

RESULTS

3.1 Characteristics of the study population

The study population composed of 143 (52.6%) males and 129 (47.4%) females. The majority (65.5%) were 12 years old. About half (51.8%) were second, third or fourth child in the family.

Table (3-1): Characteristics of the study population

Variable	No.	%
• Age(years)		
11		
12	40	14.7
13		
14	178	65.5
15		
	34	12.5
	15	5.5
	5	1.8
• Sex		
Male	143	52.6
Female	129	47.4
• Birth order		
1		
2-4	75	27.6
5+		
	141	51.8
	56	20.6
Total	272	100

3.2 Characteristics of the families of the study population

3.2.1 Father Education

A relatively high proportion (42.3%) of the pupils' fathers had high education (completed \geq 13years of formal schooling). Nearly similar proportion of fathers (39.3%) completed \leq 9 years of schooling.

3.2.2 Father Occupation

The majority (38.6%) of the pupils' fathers were self employed followed by governmental

employees (26.8%). Only 14.0% were professionals and 7.7% were skilled workers. Fathers of 14 (5.2%) of pupils were dead and fathers of another 21(7.7%) were either unemployed or retired.

3.2.3 Mother education

The majority (55.5%) of the pupils' mothers had low education (completed \leq 9 years of formal schooling). The remaining mothers were either completed \geq 13 or 10-12 years (22.4%) and (22.1%) respectively.

3.2.4 Mother occupation

The majority (79.4%) of the pupils' mothers were housewives and 19.5% of them were employed. Mothers of 3 pupils (1.1%) were dead.

3.3 Intelligence Quotient (IQ) and Factors affecting it

The study population were divided into three groups according to their IQ score. Those with high (above the 70th centile), low (below the 30th centile) and those with average (above the 30th but below 70th centile) IQ.

3.3.1 Sex

Table (3-1) shows the distribution of males and females according to their IQ level. As can be seen from the table females showed a high IQ level (39.5% and 23.1%) respectively. The association between sex and IQ level was statistically significant ($P<0.05$).

3.3.2 Parental education

Pupils' IQ significantly and positively related to parental education, children of highly educated parents were more likely to have high IQ than those of low educated parents and this was statistically significant ($P<0.01$). Table (3-4).

3.3.3 Parental occupation

The majority (60.5%) of pupils who were sons/daughters of professionals had high IQ while only 26.4% of sons/daughters of fathers involved in other occupations had high IQ. The association between father's occupation and IQ level was statistically significant ($P<0.01$).

More than half of pupils whose mothers were working had high IQ compared to only 25.5% the sons/daughters of housewives. The association between mothers employment and IQ was statistically of high significance ($P<0.01$).

3.3.4 Kindergarten Attendance

Nearly half (46.9%) of pupils attended kindergarten had high IQ while 19.5% of those pupils who did not attend had high IQ. The association between kindergarten attendance and IQ was highly significant ($P<0.01$). Table (3-6).

3.3.5 Nutritional status (BMI)



No significant association between current nutritional status as indicated by BMI and IQ was found.

3.4 Academic school performance of the study population

3.4.1 Mid-year examination result

Out of 272 pupils included in the study, 148(54.4%) had passed the mid-year examination successfully while 124(45.6%) failed the examination. Almost one third of the pupils (29.4%) had good result and only 13.2% and 11.8% had excellent or fair results respectively.

3.4.2 Extent of failure (for those who failed in the mid-year examination)

Out of the 124 pupils who failed in the mid-year examination, 57 (46.0%) failed in one or two subjects, 46 (37.1%) failed in 3-5 subjects and 21 (16.9%) failed in 6 or more subjects.

3.4.3 Mathematics mark

Nearly one fifth of the pupils (21.7%) had a very low mark in mathematics (<40). A similar percentage of pupils (22.1%) had a very good mark in mathematics (≥80).

3.4.4 Number of years of failure

The majority (84.6%) of the pupils had no previous failure while there was 9.9% of them had one failure and 4.8% had two years and only 0.7% had three years of failure.

Table (3-2): Distribution of the pupils according to the mid –year examination result

Mid-year examination result	No.	%
Passed	148	54.4
• Excellent	36	13.2
• Good	80	29.4
• Fair	32	11.8
Failed	124	45.6
Total	272	100

Table (3-3): Distribution of pupils according to their mathematics mark

Mathematics mark	No.	%
<40	59	21.7
40-59	79	29.0
60-79	74	27.2
≥80	60	22.1
Total	272	100

3.5 Factors affecting school performance:

3.5.1 Age

A significant difference in the result of mid-year examination between pupils of different ages was observed. The failure rate had increased from 30% for children 11 years old to 74.1% for those 13 years and above. While the percentage of pupils with excellent marks had decreased from 35% for those 11 years old to none for those 13 years and above. Similar association was found between mathematics marks and pupils age.

3.5.2 Sex

The failure rate in the mid- year examination was markedly higher among males compared to females (53.8% and 36.4% respectively), while excellent performance was higher among females compared to males (21.7% and 5.6% respectively). The association between the results of mid-year examination and sex was statistically significant.

On the other hand no significant association between mathematics mark and sex was found.

3.5.3 Parental education

A significant relationship between the results of mid-year examination and father’s education was found. As can be seen the failure rate decreased from 65.4% for sons/daughters of fathers with low education (≤9 years of schooling) to 20% for those of fathers of high education (≥13 years of schooling). While excellent and good performance increased with the increase in father’s education. Similar significant association was found between mathematics performance and father’s education.

The association between pupil’s school performance and mother’s education followed the same pattern as that of father’s education.

3.5.4 Parental occupation

The sons/daughters of professionals had better school performance and less failure rate than children of non-professional fathers. The association was highly significant statistically (P<0.01).

On the other hand children of working mothers had less failure rate and better school performance than children whose mothers were housewives. The association between school performance and maternal employment was statistically significant (P<0.01).

3.5.5 Living with parents

Children living with one or both parents were more likely to pass mid-year examination than those who were not (55.6% and 41.7% respectively). However, the association between the results of mid-year examination and living with parents was not statistically significant (P>0.05).

A similar association was found between mathematics marks and living with parents.



3.5.6 Kindergarten attendance

A highly significant association between school performance and kindergarten attendance was found. Children who attended kindergarten had a lower failure rate and better performance in mid-year examination and in mathematics than those who didn't.

3.5.7 School attendance

Regular school attendance significantly and positively associated with good performance in mid-year examination and in mathematics. On the other hand the failure rate progressively increased with the increase in school absenteeism.

3.5.8 Intelligence Quotient (IQ)

A significant relationship between IQ and school performance was found. Midyear examination failure rate was 7.1% for highly intelligent children compared to 80.7% for those below average intelligence.

3.5.9 History of chronic diseases

Out of the total study population, 38 (14%) gave history of chronic diseases, 60.5% of them had failed the mid-year examination compared to 43.2% of those with no such history. Similar association was found between history of chronic diseases and mathematics performance, the association however, was statistically insignificant.

3.6.10 Visual defects

Visual defects significantly affected pupil's performance in mid-year examination. All pupils with visual defects with the exception of one had failed the examination. A significant association was found between visual defects and mathematics marks.

3.6.11 other factors

No significant relationship between pupil's birth order, crowding index, nutritional status (BMI) and hospitalization was found.

3.7 Logistic regressions for factors affect school performance

In order to determine the relative effect of various independent variables on academic performance, a logistic regression analysis was carried out. Table (3-9) the results of logistic regression analysis for mid-year examination and mathematics mark (dependant variables). The results indicate that the level of academic performance was significantly affected by age, absence and IQ and the direction of effect was positive.

High	33 23.1	51 39.5	84 30.9
Average	59 41.5	46 35.7	105 38.6
Low	51 35.7	32 24.8	83 30.5
Total	143 100.0	129 100.0	272 100.0

Chi-squared=9.1

P<0.05

df=2

Table (3-5): Distribution of pupils' IQ according to parental education

IQ	Father education						Total	
	<9		10-12		13+			
	No.	%	No.	%	No.	%	No.	%
High	13	12.1	9	18.0	62	53.9	84	30.9
Average	42	39.9	28	56.0	35	30.4	105	38.6
Low	52	48.6	13	26.0	18	15.7	83	30.5
Total	107	100.0	50	100.0	115	100.0	272	100.0

Chi-squared=60.6
P<0.01
df=4

IQ	Mother education						Total	
	<9		10-12		13+			
	No.	%	No.	%	No.	%	No.	%
High	26	17.2	26	43.3	32	52.5	84	30.9
Average	57	37.7	21	35	27	44.3	105	38.6
Low	68	45	13	21.7	2	3.3	83	30.5
Total	151	100.0	60	100.0	61	100.0	272	100.0

Chi-squared=48.9
P<0.01
df=4

Table (3-4): Distribution of IQ according to sex

IQ	Male		Female		Total	
	No.	%	No.	%	No.	%
High	13	12.1	9	18.0	62	53.9
Average	42	39.9	28	56.0	35	30.4
Low	52	48.6	13	26.0	18	15.7
Total	107	100.0	50	100.0	115	100.0



Table (3-6) Distribution of pupils' IQ according to BMI

IQ	BMI				Total	
	Normal		Abnormal			
	No.	%	No.	%	No.	%
High	73	30.9	11	30.6	84	30.9
Average	90	38.1	15	41.7	105	38.6
Low	73	30.9	10	27.8	83	30.5
Total	236	100.0	36	100.0	272	100.0

Chi-square=0.2 df=2
 P>0.05

Table (3-7): School performance according to IQ

Variable	IQ						Total	
	High		Average		Low			
	N	%	N	%	N	%	N	%
a. Mid-year examination result	7	8	54	51	1	6	14	54.
Passed	6	7.1	48.	6	80.	7	45.	6
Failed								
Chi-squared=91.7 df=2 P<0.01								
b. Mathematics mark	5	0	8	39	2	7	60	22.
≥80	3	33.	1	2	5	8.4	27.	1
60-79	3	3	29.	2	9	54.	2	
40-59		3.6	5			34.	0	
<40		3.6	25.			9	21.	
Total	9	8	14	0	3	4	100	.0

	.0	.0	.0	2
Chi-squared=150.7 df=3 P<0.01				

Table (3-8): School performance according to visual defects

Variable	Normal		Abnormal		Total	
	No.	%	No.	%	No.	%
a. Mid-year examination result	147		1		148	
Passed	116	55.9	8	11.1	124	54.4
Failed		44.1		88.9		45.6
Fisher Exact test=0.013 P<0.01						
b. Mathematics mark	191		2		193	
Passed	72	72.6	7	22.2	79	71.0
Failed		27.4		77.8		29.0
Total	263	100.0	9	100.0	272	100.0
Fisher Exact test=0.003 P<0.01						

Table (3-9): Logistic regression to predict variation in academic performance.

Independent variables	Beta	P-value
Age	0.294	0.0001
Absence	0.316	0.0000
IQ	- 0.0892	0.0000
Vision	0.161	0.008
Other (none of them showed significant effect)		
Father education	NS	
Father occupation		
Mother education		
Mother occupation		
History of chronic diseases		



DISCUSSION

In this study there was higher failure rate in the mid-year examination among males compared to females and this is comparable with the results of Ebrahim study in Basrah. The study showed that the failure rate of males was higher than that of females (23.2% and 13.4% respectively)⁽¹⁰⁾. Also the present study showed females to have higher IQ scores than males and the relation between IQ levels and sex was statistically significant.

In the current study, income was not used as a measure of socio-economic status. Instead, a combination of parents' educational level and occupation were considered⁽⁹⁾.

Educated parents can improve the family life and environment by assisting their children with their homework, developing intellectual activities and creating more pressure for educational success⁽¹⁶⁾. While children from low socio-economic status homes and large family size are less likely to have the material possessions that stimulate intellectual activity such as books and constructional toys. They are less likely to read, to have a room where quiet study is possible, to hear complex verbal structures in the speech of their parents and siblings and to be motivated to do well at school by parents who have high ambitions for them⁽¹⁶⁾.

Parental education as an indicator for socio-economic status was found in this study to have a significant and direct effect on child's academic performance. Sons/daughters of professionals showed better performance and less failure rate than other children. Similar results were found in Ebrahim study⁽¹⁰⁾. These findings may indicate the role of genes in determining IQ and its heritability.

This study showed significant relation between visual defects and the result of mid-year examination (88.9% of the pupils with visual defects failed) and similar relation with mathematics (77.8% of those pupils failed).

Ebrahim study found a relation between visual defects and number of years of failure, nearly one quarter of the pupils with bilateral defects had at least one year failure⁽¹⁰⁾.

Similarly Maples WC in his study which was carried out in USA in 2003 found that visual factors were significantly better predictors of academic success⁽¹⁷⁾. Similar results were found by Sorter et al study which showed a significant relation between visual defects and mathematics achievement⁽¹⁸⁾.

This problem is correctable and can be controlled by early diagnosis and treatment and correction of the defect for this reason pre school visual screening, frequent and regular screening can prevent visual problems to be deteriorated. The ability

of a child to participate in the educational experience is at least partially dependent on good vision.

CONCLUSIONS

The overall conclusions of this study are the following:

- A high failure rate was observed among primary school children in both mid-year examination and mathematics. Males had lower academic performance than females.
- Parental education and kindergarten attendance significantly affected IQ level.
- A higher failure rate was found among children whose parents of low education.
- Kindergarten attendance had a positive effect on child school performance.
- The academic performance is affected by past medical history that children with chronic illnesses tend to have lower performance than those with out.
- The ability of a child to participate in the educational experience is at least partially dependant on good vision.
- School attendance is highly correlated to academic performance.
- There is no effect observed for family size, crowding index, birth order and nutritional status on how well the children perform at school.

RECOMMENDATIONS

1. When a child enters elementary school, the formal demands for academic learning become major determinants of further personality development although the child's intelligence as measured by IQ tests is the single variable that correlates most highly with academic success. Unfortunately, by a process of circular reasoning, the poor school performance is commonly explained by the poor IQ that is why an organized co-operation between health, educational and environmental authorities to maintain the environment of school at the standard levels it is recommended.
2. Improving health and learning of school children through school based health and nutrition programmes.
3. Provision of appropriate educational programmes to the parents to help them to motivate their children and this will encourage parents to improve their communication with school staff this will also help the parents to get specific, direct and understandable information about their children.



4. Provision of standardized evaluation programme designed to evaluate pupil growth and development with systematic documentation of the child academic performance on a daily, monthly and yearly basis in the classroom by their teachers.
5. We should stop believing that girls are naturally more literate than boys and boys are more numerate than girls, as it seems that teacher attitudes and expectations can materially influence child performance.
6. Teachers should be trained to recognize the pupils with problems and to be aware of their needs.
7. Visual screening at school entry and periodic medical, visual, and nutritional status assessment are recommended.

REFERENCES

1. Ebrahim GL. Practical Mother and Child Health in Developing Countries. Hong Kong: Catholic Funds for overseas development; 1980. pp 97-100.
2. Lee A, Tang KK, Lee SH. Youth health promoting schools; what should be the aims?. *Asia Pac J Public Health* 2000; 12: 55-7. (Medline).
3. Anonymous. Results from School Health Policies and programmes study. *Journal of school health* 2000.
4. AlMashhadani HA. Study the effect of punica granatum as oral antifungal on the corrosion inhibition of dental amalgam alloy in saliva. *Journal of Materials and Environmental Science*. 2018;9(2):662-71.
5. Linden CB. Audiologic Aspect of learning and behavior. Symposium on pediatric otolaryngology. *Pediatric Clinic of North America* 1998; 28(4):981-8.
6. Iannelli V. Your Guide to Pediatrics. School Performance problems. New York: Times Company; 2005.
7. Directorate General of Health in Basrah. (Personal communication).
8. Kulkarni M, Kalantre S, Upadhye S, Karande S, Ahuja S. Approach to Learning Disability. *Indian J Pediatr* 2001; 68(6):539-46.
9. Anonymous. School performance problems.; 2002. Internet: <http://www.keepkidshealthy.com>.
10. Oberklaid F. Making a difference to the lives of children-school as the newfeontier, IPSHA National Conference Adelaide. Professor in Centre for Community Child Health, Royal Children's Hospital Melbourne. May 28, 2022.
11. Ebrahim SM. Health status of primary school children in Basrah: The impact of school health services. Ph.D. Thesis; University of Basrah 2005.
12. Maroribanks K. Sibling dilution hypothesis: a regression surface analysis. *Psychol Rep* 2001; 89(1):33-40.
13. Al-Saadie KA, Abas HA, Almashhdani HA. Corrosion Protection of Iron Alloy Using Peganum harmala Extract as Inhibitor in Acidic Solution. *Materials Sciences and Applications*. 2015;6(11):1061.
14. Matthew H. Kim et al, The effect of Kindergarten and first grade schooling on executive function and academic skill development.2021
15. Magnuson K, Ruhm C, Waldfogel J. Does Kindergarten improve school preparation and performance?. NBER [National Bureau of Economic Research] 2006; working paper no. 10452.
16. De oins Monterio C, Akre J. The World Wide magnitude of protein energy malnutrition: An over view from WHO Global Database on child growth 2015.
17. Kadhim MM, AlMashhadani HA, Hashim RD, Khadom AA, Salih KA, Salman AW. Effect of Sr/Mg co-substitution on corrosion resistance properties of hydroxyapatite coated on Ti-6Al-4V dental alloys. *Journal of Physics and Chemistry of Solids*. 2022 Feb 1;161:110450.
18. Marco O. Bertelli and Judith H.Haskell, *Textbook of Psychiatry for Intellectual Disability and Autism Spectrum Disorder*, (pp. 1-49), May 2022.
19. UC Akubuilo et al.Academic performance and intelligence quotient of primary school children in Enugu. 2020
20. Maples WC. Visual Factors that significantly impact academic performance. *Optometry* 2003; 74(1):35-49.
21. Sorter JM, Kulp MT. Are the results of the Beery-Buktenica Developmental test of visual-motor integration and its subtests related to achievement test scores? *Optom Vis Sci* 2003; 80(11):753-63.