Prevalence, Risk Assessment and Impacts of Eye Diseases among School Children in Cairo, Egypt

Essam A. El-Moselhy[*1]; Hosam S. Abo-Seif[2]; Eman S. Abd Allah[3] and Ahmed A. Ghandor[1]

Department of Community Medicine[1]; Department of Ophthalmology[2] Faculty of Medicine
Al-Azhar University, Cairo, Egypt.
Department of Community Health Nursing[3], Faculty of Nursing, Zagazig University, Zagazig, Egypt.

Abstract: Introduction: Eye diseases represent an important public health problem in childhood. Objectives: The aim of this study was to define the prevalence of different types of eye diseases, to assess risk of these diseases, and to determine the disease impacts on scholastic achievement of school students in Cairo, Egypt. Research design: A cross-section, analytical study design was chosen to perform this study. Research setting: The study was conducted in Al-Marg region, east district of Cairo. Four, randomly selected, schools were the field of the present study in this region. These schools were two primary schools (one public and one private) and two preparatory schools (one public and one private). Subjects and methods: The total number of students was 2160. All the students were examined clinically; for each case with eye disease a control case was chosen. The cases and controls were interviewed. Results: The study showed that 28.2% of the students have eye diseases. The most common eye diseases were trachoma (9.3%), errors of refraction (7.1%) and allergic conjunctivitis (6.3%). All eye diseases were more common in public schools. The most important significant socioeconomic and health care behavioral risk factors for eye diseases were the low level of parental occupation (OR=4.79), no early consultation for eye diseases (OR=3.13) and never received eye examination (OR= 2.68). Also, the most important significant personal characteristic risk factors were previous eye diseases (OR=3.35), positive consanguinity of the parents (OR=2.67), sibling(s) with eye diseases (OR=2.19), last birth order child (OR=1.90) and male sex (OR=1.56). Further, age and/or sex were significant risk factors for specific eye diseases; trachoma, errors of refraction, allergic conjunctivitis and muco-purulent conjunctivitis. Also, 37.7% of the students with eye diseases had significant school absenteeism 3-4 days/month (P=0.01) and 21.8% of them had significant results of the first term exam <50.0% (P=0.00). Conclusions: Eye diseases are prevalent among school students, especially in public schools in Cairo, Egypt. Many of the risk factors of eye diseases can be manipulated. So, these diseases and its negative impacts can be prevented. Recommendation: Improving students' and environment's hygiene, health education, regular eye screening and treatment of students as regard eye diseases in Egypt are an important essentiality. Also, eye health component of school health services should be integrated in school health program, and this should be integrated in medical and nursing curriculums. Lastly, further studies on large numbers of students in different rural and urban areas in Egypt are recommended.

[**Essam A. El-Moselhy; Hosam S. Abo-Seif; Eman S. Abd Allah and Ahmed A. Ghandor. Prevalence, Risk Assessment and Impacts of Eye Diseases among School Children in Cairo, Egypt**. Journal of American Science 2011;7(1):235-246]. (ISSN: 1545-1003). http://www.jofamericanscience.org.

Key words: Eye Diseases, School Children, Impacts

1. Introduction:

School children are considered one of the most important sectors of population due to their continuous growth and development at all levels. They are a vulnerable group and great attention should be paid for them (Abdel-Wahab and Mahmoud, 1987). So, coordinated school health programs in conjunction with community efforts can prevent many health problems among students and help them to establish lifelong safety skills (Allensworth et al., 1997 and El-Moselhy et al., 2005a).

Vision is an important requirement for learning and communication. Further, optimal vision is essential for learning, health and educational needs (Adegbehingbe et al., 2005). So, eye diseases are a public health problem (Alakija, 1995). But, some eye care and public health professionals have argued that every child should receive a comprehensive examination by an optometrist or ophthalmologist at school entrance. While, others maintain that vision screening is a cost-effective method for identifying those who would benefit from eye exams. These competing recommendations for how best to identify children with vision problems are prompting new research on the costs and benefits of various strategies, including an examination of the impact of

untreated vision problems on school performance (Ferebee, 2007).

Approximately 1.4 million children in the world are blind; 75.0% of them live in developing countries. For every blind child, three children have serious vision impairment and 13 need eyeglasses (The USAID Child Blindness Program, 2007). Most of the blindness or serious eye problems can be prevented if detected at an early stage. So, the screening of eye health of the school children is important procedure; it will reveal most of the problems and thus prevent many visual defects (Al-Nasser et al., 1989; Donaldson, 2002 and Adegbehingbe et al., 2005). To ensure early detection of visual defects students should be examined early in the primary school (Badr and Qureshi, 1981). Primary care clinicians can play a vital role in preserving vision by ensuring that patients undergo periodic evaluations by eye care professionals and receive needed eye care (Rowe et al., 2004).

Prevalence of eye diseases differ in different communities according to many factors, which include social and environmental characters of the community, health habits of the community, personnel hygiene and technical methods used in diagnosis of eye diseases (Al-Nasser et al., 1989 and Abdou et al., 2007).

At present, trachoma remains the most important infectious cause of blindness in the world (Resnikoff et al., 2004). Repeated infection with the ocular strains of *Chlamydia trachomatis* can bring about scarring of the conjunctiva, resulting in a cascade of entropion, inward-turned eyelashes, and eventually blindness due to corneal opacity (Mariotti, 2004). In Egypt, the rate of inflammatory eye diseases among rural population was unchanged since 1920s (Courtright et al., 1989). Trachoma infection among primary school children in Upper Egypt was found to be 64.1% (Rashwan and Mohamed, 1992). The prevalence of trachoma was about 71.0% in KSA (Badr, 1982a&b). But it starts to decrease to about 22.0% in the population (Faran and Tabbara, 1987).

Eye health problems among school children in developing countries have increased over time (Al-Nasser et al., 1989). It is estimated that 7.0% of new schools' entrants have vision defects. About 6.0% of boys are likely to be color blind and 1.8% of the children have squint. Also, 3.3% of school children had visual loss due to lack of eye care, 2.3% of boys had squint and 1.8% had refractive error (Badr, 1982a&b). Further, 12.0% of school children had refractive error, 2.8% had squint and 0.7% had color blindness error (Al-Nasser et al., 1989). Also, the most common refractive error among students of a female preparatory school in Jeddah, KSA was found to be myopia, it represents 12.6% of the studied group (Salem, 1999).

Prevalence of corneal scarring among children in Assiut governorate was 2.1% (Farahat et al., 1986). Recently, its prevalence among school children aged 6-18 years in Sohag governorate was 1.8% (Mohamed, 1998).

Allergic conjunctivitis affects between 10.0-15.0% of the total United Kingdom population (McGill et al., 1998). While, it was found among 8.7% of the studied group of females preparatory schools in KSA (Salem, 1999).

Lost opportunities associated with blindness and visual impairment lead to emotional stress and economic hardship. Blind children and those with limited sight experience social isolation, low self-esteem, lack of independence, and lost educational and economic opportunities. Lack of eye care can have a severe economic impact by perpetuating poverty or pushing a family into poverty (The USAID Child Blindness Program, 2007).

Eye health service component of school health services has prime importance and is responsible for early detection of refractory errors, correction of squint and amblyopia, detection and treatment of eye infections such as trachoma (Al-Nasser et al., 1989).

Subjects objectives:

A- Ultimate objective:

Improving quality of eye health of the school children in Egypt.

B- Immediate objectives:

1- To determine the prevalence of eye diseases among school children in Cairo, Egypt.
2- To assess the sociodemographic, environmental and health care behavior risk factors for eye diseases among school children in Cairo, Egypt.
3- To determine the impacts of eye diseases on the school absenteeism and scholastic achievement of the school children in Cairo, Egypt.

2. Subjects and Methods:

A- Technical Design

I- Research Questions:

What are the most common prevalent eye diseases among school children in Cairo, Egypt? Is there sociodemographic, environmental and health care behavior factors effects on prevalence of eye diseases among these school children? Is there effects of eye diseases on school absenteeism and scholastic achievement of school children in Cairo, Egypt?

II- Research Design:

A cross-section, analytical study design was chosen to investigate the current research problem.

III- Research Setting:

This study was conducted in Al-Marg region, east district of Cairo, Egypt. One primary and one preparatory public school were chosen randomly in this region. Also, one primary and one preparatory private school were chosen randomly in the same region. These schools were the field of the present study.

VI- Research Sample:

In each school, three classes were chosen randomly in each educational class level. So, these classes were fifty four; all students of these classes were recruited and examined. The total number of students was 2160; 1210 in public schools and 950 in private schools. The students aged from 6-16 years. For each case with eye disease a control case was chosen from the students' class list, the name after the diseased case. The cases and controls were interviewed, in case of young and/or non-cooperative student one of his/her parents was interviewed.

VI- Research Tools and Methods:

1- Diagnosis of childhood eye diseases: All students included in the study had undergone full physical examinations to detect those with eye diseases. The suspicious cases were invited to the investigator's private clinic for further examinations. All students with eye diseases were managed freely. Clinical examination included:

1-1- General eye condition was observed in good illumination.

1-2- Visual acuity was tested by Landolt's broken rings chart. Students were seated at six meters distance from the chart in good illumination. The student was asked to refer (indicate) to the direction of the opening of the ring while he/she covering one eye and so the other eye in turn.

1-3- Stages of trachoma were diagnosed according to Loewenthal and Pe're (1990).

1-4- Tonometry was done by palpation and by tonometer in the suspicious cases.

1-5- Squint cover and uncover test was done using a piece of carton while the student focusing on near and far objects. Hirschberg method was done where the light source was held at a distance of fifty cm from the student's head to observe the angle of deviation according to the corneal light reflection.

1-6- Color vision was tested by Ishhara chart.

1-7- Diffuse and focal illumination & direct and indirect ophthalmoscopy were, also, done.

2- Interview questionnaire: It was used to collect data relevant to topic of the study. Also, one of the student's parents was submitted to an interview if needed.

3- Scholastic achievement:

It was determined according to results of the first term exam; very good/excellent (>80.0%), passed/good (50.0-80.0%) and failed (<50.0%).

B- Operational Design

I- Preparatory Phase (pilot study): A pilot study was done on 100 students to test the feasibility of the study at the study sites and to measure the time and resources needed for the field work.

II- Ethical Consideration:

A verbal agreement, consent, from all the students' parents to participate in the research was taken after full explanation of the aim of the research. The participants' parents were assured that the researcher's will investigate and treat all positive cases and the parents will be informed.

III- Practical Phase:

This phase took about 4 months. The students were examined and the data were collected, in the second term, through field visits.

IV- Statistical Design:

Odds ratio (OR) with 95% confidence interval (CI) or exact confidence limits (ECL) was used to assess the risk. Also, Yates corrected Chi-square (χ^2) and Fisher exact (FE) were used as tests of significance. The significance level for χ^2 and Fisher exact was accepted if the P-value <0.05.

3. Results:

The overall percent of eye diseases among the studied school children (table 1) was 28.8%. In details; the percent of trachoma was 9.3% (active cases were 58.2% and inactive were 41.8%). As regard errors of refraction, 7.1% of our students had errors of refraction (corrected cases were 56.2% and uncorrected were 43.8%). Regarding allergic conjunctivitis, 6.3% of our students had allergic conjunctivitis. Also, 1.9% of the students had phylecten. At the same time, 1.6% of the students had squint. As regard color blindness, 0.9% of the students had color blindness. Regarding muco-purulent conjunctivitis (MPC), 0.8% of the students had MPC. Lastly, corneal scarring was found among 0.4% of the students.

Distribution of cases with eye diseases of students in both public and private schools is presented in table (2), the total number of eye

diseases among the studied public schools children was 441 (36.5%) compared with 181 (19.1%) among the studied private schools children with a statistically significant difference (P<0.001). At the same time, the total number of students with eye diseases among the studied public schools children was 432 (35.7%) compared with 178 (18.7%) among the studied private schools children with a statistically significant difference (P<0.001). In details; the percent of trachoma among the studied public schools children was 13.6% (active cases were 56.7% and inactive were 43.3%) compared with 3.9% (active cases were 64.9% and inactive were 35.1%) among the studied private schools children. These differences are statistically significant (P<0.001). At the same time, muco-purulent conjunctivitis was found among 1.2% of the studied public schools children compared with 0.3% among the studied private schools children. This differences are statistically significant (P=0.04). As regard errors of refraction, 7.2% of the students in public schools had errors of refraction (corrected cases were 3.4% and uncorrected were 3.8%) compared with 6.9% of the students in private schools (corrected cases were 4.7% and uncorrected were 2.2%). The differences as regard prevalence in general and the corrected are statistically insignificant (P=0.89 and P=014, respectively). While, the difference between prevalence the uncorrected is statistically significant (P=0.05). Regarding allergic conjunctivitis, 7.5% of our students in public schools had allergic conjunctivitis compared with 4.8% of the students in private schools. The difference is statistically significant (P=0.01). At the same time, 2.6% of our students in public schools had phylecten compared with 1.1% of the students in private schools. The difference is statistically significant (P=0.02). Also, 2.2% of our students in public schools had squint compared with 0.6% of the students in private schools. The difference is statistically significant (P=0.01). Lastly; color blindness (0.9%), corneal scarring (0.6%), epiphora (0.4%) and ptosis (0.3%) were found among our students in public schools compared with 0.8%, 0.2%, 0.1% and 0.1% of the students in private schools. The differences are statistically insignificant.

As regard distribution of cases with eye diseases and control group of students according to complaint (table 3), we noticed that all symptoms of eye diseases were not present among the controls except headache; 15.7% and 11.0% among the cases and controls respectively. The difference is statistically significant (P=0.02).

As respect socioeconomic risk factors (table 4), the low level of parental education (illiterate or primary), low level of parental occupation (unskilled labor) and low social level were significant risk factors for eye diseases (OR=2.71, 95% CI: 2.18-3.45; OR=4.79, 95% CI: 3.43-6.70 and OR=3.08, 95% CI: 2.36-4.01, respectively). On the other hand, the high level of parental education (university), high level of parental occupation (professional) and high social level were significant protective factors for eye diseases (OR=0.37, 95% CI: 0.29-0.47; OR=0.35, 95% CI: 0.51-0.44 and OR=0.37, 95% CI: 0.29-0.47, respectively).

Regarding health care behavior risk factors (table 5); the poor eye and environmental hygiene are significant risk factors for eye diseases (OR=1.37, 95% CI: 1.06-1.75 and OR=1.41, 95% CI: 1.11-1.80, respectively). Lastly, no early consultation for eye diseases and incompliance with therapy were risk factors eye diseases (OR=3.13, 95% CI: 2.46-4.00 and OR=1.29, 95% CI: 1.02-1.63, respectively).

In respect of personal characteristics risk factors (table 6), yonger age group 6-8 years was insignificant protective factor (OR=0.82, 95% CI: 0.63-1.06). On the other hand, older age group 12-16 years was insignificant risk factor (OR=1.13, 95% CI: 0.89-1.43). At the same time, male sex was significant risk factor (OR=1.56, 95% CI: 1.23-1.98).Also, first and last birth order child were significant protective with risk factors, respectively (OR=0.45, 95% CI: 0.35-0.58 and OR=1.90, 95% CI: 1.22-2.45, respectively). In addition, previous eye diseases and sibling(s) with eye diseases represented significant risk factors (OR=3.35, 95% CI: 2.63-4.28 and OR=2.19, 95% CI: 1.67-2.87, respectively). Lastly, positive consanguinity among parents represented a significant risk factor for eye diseases among their offspring's (OR=2.67, 95% CI: 1.03-5.55).

As regard the impacts of eye diseases (table 7); 41.2%, 37.7%, 21.1% and 52.3%, 30.3%, 17.4% of the students with eye diseases and controls, respectively had school absenteeism 0-2, 3-4 and ≥5 days/month, respectively. The difference was statistically significant regarding school absenteeism 3-4 days/month (P=0.01). As respect scholastic achievement; 21.8%, 34.6%, 43.6% and 12.6%, 41.2%, 46.2% of the students with eye diseases and controls, respectively had results of the first term exam <50.0%, 50.0-80.0% and >80.0%, respectively. The differences were statistically significant respecting to results of the first term exam <50.0% (P=0.00) and 50.0-80.0% (P=0.02).

As regard distribution of different cases with eye diseases and control group of students according to age and sex (table 8); younger age group 6-8 years and male sex were significant risk factors for trachoma (OR=2.12, 95% CI: 1.51-2.99 and OR= 1.39, 95% CI: 0.99-1.95, respectively). While, older

age group 12-16 years and female sex were significant risk factors for errors of refraction (OR=2.51, 95% CI: 1.72-3.67 and OR=1.47, 95% CI: 1.02-2.14, respectively). Also, big age group 12-16 years was significant risk factor for allergic conjunctivitis (OR=2.28, 95% CI: 1.53-3.38). On the other hand, male sex was insignificant risk factor (OR=1.20, 95% CI: 0.81-1.77). At the same time, small and middle age groups 6-8 and 9-11 years, respectively were insignificant risk factors for phylecten. Also, we cleared that male sex was insignificant risk factor for squint.

Table (1): Distribution of eye diseases among the studied school children.

Eye diseases	No. (n=2160)	Percent
Trachoma:	201	9.3
Active	117	58.2
Inactive	84	41.8
Errors of refraction:	153	7.1
Corrected	86	56.2
Un corrected	67	43.8
Allergic conjunctivitis	137	6.3
Phylecten	41	1.9
Squint	34	1.6
Color blindness	19	0.9
Muco-purulent conjunctivitis (MPC)	18	0.8
Corneal scarring	9	0.4
Epiphora	6	0.3
Ptosis	4	0.2
Total number of eye diseases	622	28.8
Total number of students with eye diseases	610	28.2

Table (2): Distribution of cases with eye diseases of students in both public and privateschools.

Eye diseases	Public schools (n=1210)		Private schools (n=950)		χ^2 FE	*P*-value
	No.	%	No.	%		
Trachoma:	164	13.6	37	3.9	56.10	0.000
Active	93	56.7	24	64.9	23.66	0.000
Inactive	71	43.3	13	35.1	27.63	0.000
Errors of refraction:	87	7.2	66	6.9	0.02	0.893
Corrected	41	47.1	45	68.2	2.19	0.138
Un corrected	46	52.9	21	31.8	3.97	0.046
Allergic conjunctivitis	91	7.5	46	4.8	5.98	0.014
Phylecten	31	2.6	10	1.1	5.73	0.016
Squint	27	2.2	7	0.6	6.74	0.009
Color blindness	11	0.9	8	0.8	0.00	0.946
Muco-purulent conjunctivitis	15	1.2	3	0.3	4.44	0.035
Corneal scarring	7	0.6	2	0.2	FE	0.313
Epiphora	5	0.4	1	0.1	FE	0.238
Ptosis	3	0.3	1	0.1	FE	0.635
Total number of eye diseases	441	36.5	181	19.1	77.68	0.000
Total number of students	432	35.7	178	18.7	74.75	0.000

Table (3): Distribution of cases with eye diseases and control group of students according to their complaint.

Complaint	Cases (n=610)		Controls (n=610)		χ^2	P-value
	No.	%	No.	%		
Eye itching	**213**	**34.9**	**0**	**0.0**	255.64	0.000
Headache	**96**	**15.7**	**67**	**11.0**	5.55	0.018
Sight defect	**74**	**12.1**	**0**	**0.0**	76.66	0.000
Eye disfigurement	**52**	**8.5**	**0**	**0.0**	52.25	0.000
Eye discharge	**18**	**3.0**	**0**	**0.0**	16.30	0.000

Table (4): Distribution of cases with eye diseases and control group of students according to their socioeconomic risk factors.

Socioeconomic risk factors	Cases (n=610)		Controls (n=610)		OR (95% CI)
	No.	%	No.	%	
Parental educational level:					
Illiterate & primary	318	52.1	175	28.7	2.71 (2.12-3.45)
Preparatory & secondary	102	16.7	99	16.2	1.04 (0.76-1.42)
University	190	31.2	336	55.1	0.37 (0.29-0.47)
Parental occupational level:					
Unskilled labor	199	32.6	56	9.2	4.79 (3.43-6.70)
Semi-skilled & skilled labor	222	36.4	211	34.6	1.08 (0.85-1.38)
Professional	189	31.0	343	56.2	0.35 (0.51-0.44)
Social level:					
Low	259	42.5	118	19.3	3.08 (2.36-4.01)
Middle	162	26.5	158	25.9	1.03 (0.80-1.35)
High	189	31.0	334	54.8	0.37 (0.29-0.47)

Table (5): Distribution of cases with eye diseases and control group of students according to health care behavior risk factors.

Health care behavior risk factors	Cases (n=610)		Controls (n=610)		*OR (95% CI)*
	No.	%	No.	%	
Eye hygiene:					
Good	396	64.9	437	71.6	0.73 (0.57-0.94)
Poor	214	35.1	173	28.4	1.37 (1.06-1.75)
Environmental hygiene:	362	59.3	411	67.4	0.71 (0.56-0.90)
Good	248	40.7	199	32.6	1.41 (1.11-1.80)
Poor					
Have ever received eye examination?	373	61.1	493	80.8	0.37 (0.29-0.49)
Yes	237	38.9	117	19.2	2.68 (2.05-3.50)
No					
Early consultation for eye diseases:	258	42.3	425	69.7	0.32 (0.25-0.41)
Yes	352	57.7	185	30.3	3.13 (2.46-4.00)
No					
Compliance with therapy:	226	37.0	263	43.1	0.78 (0.61-0.98)
Yes	384	63.0	347	56.9	1.29 (1.02-1.63)
No					

Table (6): Distribution of cases with eye diseases and control group of students according to personal characteristics risk factors.

Characteristics risk factors	Cases (n=610)		Controls (n=610)		OR (95% CI)
	No.	%	No.	%	
Age:					
5-8	152	24.9	176	28.8	0.82 (0.63-1.06)
9-11	203	33.3	197	32.3	1.05 (0.82-1.34)
12-16	255	41.8	237	38.9	1.13 (0.89-1.43)
Sex:					
Male	399	65.4	334	54.8	1.56 (1.23-1.98)
Female	211	34.6	276	45.2	0.64 (0.50-0.81)
Birth order:					
First	166	27.2	276	45.2	0.45 (0.35-0.58)
In the middle	199	32.6	175	28.7	1.20 (0.94-1.55)
Last	245	40.2	159	26.1	1.90 (1.22-2.45)
Previous eye diseases:					
Yes	355	58.1	179	29.3	3.35 (2.63-4.28)
No	255	41.8	431	70.7	0.30 (0.23-0.38)
Sibling(s) with eye diseases:	210	34.4	118	19.3	2.19 (1.67-2.87)
Yes	400	65.6	492	80.7	0.46 (0.35-0.60)
No					
Positive consanguinity of the parents:	31	5.1	12	2.0	2.67 (1.30-5.55)
Yes	579	94.9	598	98.0	0.37 (0.18-0.77)
No					

4. Discussion:

Blindness and visual impairment persist despite significant reductions in blindness through public health measures. Poverty, lack of primary health care and eye services, and unavoidable causes are major factors contributing to blindness. Injuries, genetic conditions, degenerative disorders, harmful eye treatments, and preventable infectious and non-communicable diseases; rarely found in industrialized countries; can cause blindness and visual impairment (The USAID Child Blindness Program, 2007). Also, as optimal vision is essential for health, learning and educational needs (Adegbehingbe et al., 2005); so, eye diseases especially that affecting vision are an important public health problem (Alakija, 1995).

Trachoma infection among primary school children in Kena Governorate, Egypt was found to be 64.1% (active cases were 78.8% and inactive were 21.2%) (Rashwan and Mohamed, 1992). Also, the prevalence of trachoma was 43.0% and of infection was 21.0% (Abdou et al., 2007). This result is so higher than ours. There are many factors that influencing the intensity of trachoma infection in children. Some of these factors may be cultural or site specific, while other may be environmental (Potter, 1991). On the other hand, our result is similar to the prevalence of trachoma (about 10.0%) among rural school children in KSA (Cross, 1985 and Faran & Tabbra, 1987). At the same time, errors of refraction are of the most common eye problems (Reddy et al., 2008). Our figure (7.1%) is similar to that estimated in primary schools in KSA; 7.0% of new schools' entrants have vision defects. Further, 12.0% of the eleven year old with normal vision show a defect at 16 years (Badr and Qureshi, 1981). Moreover, 18.7% of school children in Thailand had refractive errors (Nanthavisit et al., 2008). Also, 3.3% of school children in KSA had visual loss due to lack of eye care (Badr, 1982a&b). In addition, 12.0% of school children in KSA had refractive error; 38.3% of them were detected during research examination (Al-Nasser et al., 1989). In the Baltimore Vision-Screening Project the estimated prevalence of visual morbidity was found to be 8.2% for refractive errors (Presian and Norak, 1996). In addition, 3.1% of school students in Nigeria had refractive errors. None of them had an eye examination in the past (Adegbehingbe et al., 2005). At the same time, the most common refractive error among students of preparatory school in Jeddah, KSA was found to be myopia; it represents 12.6% of the studied group (Salem, 1999). On the other hand, myopia was found

among 1.3% of rural residents aged up to 20 years (Khallaf and Khalifa, 2004). Also, in the Indian study, 5.1% of the children in schools had a visual acuity of <6/12 in the better eye while 12.5% had a visual acuity of 6/9 or worse in either eye (Kalikivayi et al., 1997). This small figure could be explained; only one type of errors of refraction and their group contain infants and young children who can't indicate their own visual acuity. Also, in the US prevalence of reported visual impairment and blindness among children aged 6-17 years was 3.3% (CDC, 2005). Regarding allergic conjunctivitis, it was found among 8.1% of a studied group of rural residents aged up to 20 years (Khallaf and Khalifa, 2004). Also, it was found among 8.7% of a studied group of preparatory schools in KSA (Salem, 1999). On the other hand, it is less than the prevalence of allergic rhino-conjunctivitis (15.3%) among school children in Cairo (Georgy et al., 2006). Also, it is less than the 11.0% of the Nigerian school students; only 12.5% of them had visited an eye specialist at one time or the other (Adegbehingbe et al., 2005). At the same time, 1.9% of our students had phylecten. This figure is close to Khallaf and Khalifa (2004), who reported 2.1%. Strabismus (squint) is misalignment of visual axis of the eye in such a way that an object in the space is not visualized simultaneously by focus of each eye (Cross et al., 1985). It is suggested that early detection and correction of squint will prevent irreversible amblyopia (Al-Nasser et al., 1989). In primary schools in KSA the prevalence of squint among students was 1.8% (Badr and Qureshi, 1981), 2.3% (Badr, 1982a&b) and 2.8% (Al-Nasser et al., 1989). In the Baltimore, the US it is estimated that prevalence of squint was found to be 3.1% for strabismus (Presian and Norak, 1996). While, in Nigeria the prevalence of squint among students was 1.3% (Adegbehingbe et al., 2005). As regard color blindness, it is one of the congenital visual defects. At present time it is beyond correction (Al-Nasser et al., 1989). In primary schools in KSA it is estimated that 6.0% of students are likely to be color blind (Badr and Qureshi, 1981). Also, 0.7% of school children in KSA had color blindness (Al-Nasser et al., 1989). Regarding MPC, our figure is less than that (2.1%) estimated among rural residents aged up to 20 years (Khallaf and Khalifa, 2004). Our small figure could be explained; more hygienic environment, higher socioeconomic status and our group didn't contain infants and young children younger than six years who can't take care of their own cleanliness. Lastly, our figure regarding corneal scarring (0.4%) is in accordance with Adegbehingbe et al. (2005) (0.4%) and much smaller than figures reported by Farahat et al. (1986) and Mohamed (1998); 2.1% and 1.8%, respectively. This might be attributed to the recent advancement in health care of the eye.

The prevalence of eye infections in private school children is less than that in public schools (Shrestha et al., 2009). Most of the patients with eye diseases in Nigeria were from the lower socioeconomic class (Ajaiyeoba and Scott, 2002). This relation could be linked in certain eye diseases particularly of infectious origin to ignorance, poverty and bad environmental hygiene (Ajaiyeoba et al., 1996 and Hesselbarth, 2005). In the US, Hispanic children had significantly higher prevalence of reported visual impairment and blindness (3.6%) than non-Hispanic white children (2.3%). Also, children whose families were below the federal poverty level were nearly twice as likely to be visually impaired as children from families whose income was ≥200.0% of the poverty level. Moreover, children from families with incomes equal or more than twice of the federal poverty level were more likely to see an eye-care provider during the preceding year than children from families with incomes below poverty level (22.7% vs. 17.0%) (CDC, 2005). In India, the home of largest number of blind children in the world, among the rural population of the economically backward states childhood blindness is alarmingly high (Jain et al., 2005). Also, the two inflammatory eye diseases; trachoma and MPC are more common in unhygienic environment and among low socioeconomic standard population (Potter, 1991; Rashwan and Mohamed, 1992; Ajaiyeoba et al., 1996; Ajaiyeoba & Scott, 2002 and Hesselbarth, 2005). So the differences in their percent in public and private schools could be explained; more number of students in public class rooms compared with private schools, low hygienic environment and low socioeconomic status.

Also, we noticed that all symptoms of eye diseases were not present among the controls except headache. This result is consistent with Al-Nasser et al. (1989), they showed that headache was significantly more present among their students with refractory errors (P=0.0001). As refractory errors have found to be associated with headache, so headache is present more among our studied group. On the other hand, headache is a general symptom for many childhood diseases such as anemia, so its presence in controls was expected. In Egypt, about 50.0% of children are suffering from headache and anemia (UNICEF, 2000 and El-Masry et al., 2007).

As regard socioeconomic risk factors, poverty is a major factor contributing to blindness and visual impairments (The USAID Child Blindness Program, 2007). The majority (73.0%) of patients in Nigeria were from the lower socioeconomic class (Ajaiyeoba and Scott, 2002). This relation could be

linked in certain eye diseases particularly of nutritional and infectious origin to ignorance, poverty and dirty environment (Ajaiyeoba et al., 1996). In the US, children belonging to minorities had a significantly higher prevalence of reported visual impairment and blindness than other children. Also, children whose families were below the federal poverty level were nearly twice as likely to be visually impaired as children from families whose income was ≥200.0% of the poverty level. Further, children from high income families were more likely to see an eye-care provider during the preceding 12 months than children from low income families (CDC, 2005). Also, in India the large number of blind children among the rural population was from the lower socioeconomic class (Jain et al., 2005).

Pollution in the house and/or environment is associated with increase prevalence of trachoma (Rashwan and Mohamed, 1992; Ajaiyeoba et al., 1996; Ajaiyeoba & Scott, 2002 and Hesselbarth, 2005). Also, the water-washed diseases (as eye diseases) caused by insufficient water for personal hygiene; children are disproportionally affected (Hesselbarth, 2005). The prevalence of trachoma among those with unclean faces were three times more likely to have clinical trachoma or ocular *C. trachomatis* infection, compared with those with clean faces (OR=3.1, 95% CI: 1.6-6.2 and OR=3.0, 95% CI: 1.4-6.3, respectively). Further, about 75.0% of compounds were within 30 minute of a water source. Also, flies on the face were a risk factor for trachoma but not for *C. trachomatis* infection (Abdou et al., 2007). Also, poor eye hygiene was risk factor for eye infections (Shrestha et al., 2009). On the other hand, the good eye- and environmental hygiene are significant protective factors for eye diseases (OR=0.73, 95% CI: 0.57-0.94 and OR=0.71, 95% CI: 0.56-0.90, respectively). At the same time, never received eye examination is a significant risk factor for eye diseases (OR=2.68, 95% CI: 2.05-3.50). Lack of primary health care and eye services are major risk factors of blindness and visual impairment (The USAID Child Blindness Program, 2007). There is gross lack of eye examination in different parts of rural KSA (Al-Nasser et al., 1989). However, only 66.0% of children ages three to five years old in a group of 102 pediatric practices covering 23 states in the US, received vision screenings. No data on office-based vision screenings for older children is available. Health care providers may be missing opportunities to identify vision problems in children during routine visits. It is estimated that only 5.0-14.0% of children receive eye exams performed by optometrists or ophthalmologists before school entry). In KSA, 3.3% of school children had visual loss due to lack of eye care (Badr, 1982a&b). Further, Badr & Qureshi (1981) and Badr (1982a) cleared that only 9.7% and 8.2%, respectively of their students in KSA had received eye examinations. The prevalence of undetected vision problems among school children in the US was estimated to be 5.0-10.0% (Castanes, 2003). Also, in the US, among children aged 6-17 years; 20.7% had visited an eye-care provider during the preceding year. Asian, non-Hispanic black and Hispanic children (15.0%, 19.1%, and 15.5%, respectively) were significantly less likely to have visited an eye-care provider during the preceding year than non-Hispanic white children (22.8%) (CDC, 2005). So, eye care oriented physician with specific training courses in management of community ophthalmic problems is recommended (Rashwan and Mohamed, 1992). Also, previously undiagnosed eye problems especially refractive errors were found in 22.5% (Adegbehingbe et al., 2005). Lastly, early detection of eye diseases and compliance with treatment is requested (Hunter, 2005). Also, intervention chemotherapeutic is urgently recommended to trachomatous children (Rashwan and Mohamed, 1992), as it shown to be succeeding in reducing infection among children by 4-10 folds in Tunisia (Dawson et al., 1976) and many other places (Melese et al.. 2004; Solomon et al., 2004; Gaynor et al., 2003 and Chidambaram et al., 2006). So, early diagnosis and compliance with therapy is urgently needed.

We cleared that younger age group 6-8 years was insignificant protective factor, and older age group 12-16 years was insignificant risk factor. These results are expected as some of the studied eye diseases are more prevalent among small age group as trachoma and MPC, while other studied eye diseases are more prevalent among big age group as errors of refraction. In addition, rates for vision problems increase as children age. Nearly 8.0% of children ages 0-5 experience eye problems, while 25.0% of adolescents 12-17 are reported to have eye problems). Also, the prevalence of ocular infections was increased with increase in age (Kumar et al., 2004 and Shrestha et al., 2009). There is a preponderance (48.7%) of eye disorders in students aged 13-15 years (Adegbehingbe et al., 2005). Also, Khandekar and Abdu-Helmi (2004) showed that rate of vision impairment was significantly higher among high age group (P=0.0001). We reported that male sex was significant risk factor. This result is expected as many of the studied eye diseases are more prevalent among males (Rashwan and Mohamed, 1992; MOLISA, 1998; Ajaiyeoba & Scott, 2002; Khallaf and Khalifa, 2004; Adegbehingbe et al., 2005; Reddy et al., 2008 and Shrestha et al., 2009). Further, the male sex was significant risk factor for eye diseases (OR=1.6, 95% CI: 1.22-1.51) (Shrestha

et al., 2009). This result could be explained; males are exposed to environmental pollution, unhygienic health practice, infection and trauma inside- and outside home. On the other hand, Khandekar and Abdu-Helmi (2004); Adegbehingbe et al. (2005) and El-Moselhy et al. (2005b) found that female sex was risk factor for vision impairment. There are more female students (53.7%) with ocular disorders than males (46.4%), with no statistically significant difference (Adegbehingbe et al., 2005). Girls have less access to medical and surgical services than boys. These services include diagnosis of correctable cataract, treatment of eye infections, and provision of corrective glasses. In a study in Tanzania, parents were less likely to take their young daughters with congenital cataracts to the hospital for surgery than their sons. This gender inequity continues into adulthood; women account for two-thirds of blindness and three-fourths of trachoma-related blindness (The USAID Child Blindness Program, 2007). Further, first and last birth order child were significant protective and risk factors, respectively. These results could be explained; first birth order child is more prone to paternal care while last birth order child is more prone to paternal negligence. Lastly, we noticed that positive consanguinity among parents represented a significant risk factor. This result is consistent with Tabbara et al. (1988) as regard refractory errors and squint. Also, Al-Salem and Rawashdeh (1992); El-Moselhy et al. (2005b) and Tabbara et al. (2005) supported our result and stated that parental consanguinity in those with visual impairment was high. On the other hand, our result is inconsistent with Al-Nasser et al. (1989), they cleared that consanguinity was insignificantly more present among their students with refractory errors (P=0.1). More over, we calculated that their odds ratio risk was 1.17, 95% CI: 0.97-1.41.

Nearly 17 million children with low vision or blurred eye sight lack visual aids, services, or eyeglasses to help them function. These children often are unable to read a chalkboard or textbook. They restrict their movements, fearful of injury or embarrassment. Less than 15.0% of children with disabilities in developing countries have access to education (The USAID Child Blindness Program, 2007). Recent focus on school achievement due to the No Child Left Behind Legislation, Healthy People 2010 recommendations for better child vision screening and expanded computer use among school-age children have re-awakened interest in the importance of childhood vision and early treatment of problems). As refractory errors have found to be associated with headache and difficulties to see clearly what writing on the board in the class room, so it has an adverse effect on the students' scholastic achievement (Al-Nasser et al., 1989). School-based vision screening and eyeglass distribution improve vision and academic potential for children such as these young Guatemalan girls (The USAID Child Blindness Program, 2007).

We observed that small age group and male sex were significant risk factors for trachoma. Our result as regard age is agreed with Rashwan & Mohamed (1992) and Khandekar and Abdu-Helmi (2004). Also, our result regarding sex is in accordance with Rashwan & Mohamed (1992) and Courtright et al. (1989); they showed that the disease is more common among males. This could be explained, the outdoor exposure is more preferable for males and females may have more care for their pictures (Rashwan and Mohamed, 1992). While big age group and female sex were significant risk factors for errors of refraction. Our result as regard age is agreed with Rowe et al. (2004), they showed that vision problems were common and its prevalence increases with age. Also, Khallaf and Khalifa (2004) showed that myopia was more common among girls with big age group (10-19 years), but the difference was insignificant. Moreover, 12.0% of the eleven year old with normal vision show a defect at 16 years (Badr and Qureshi, 1981). Also, El-Moselhy et al. (2005b) agreed that vision impairment was found more among females. On the other hand, Khandekar and Abdu-Helmi (2004) stated that the risk of vision impairment was significantly higher in male students than female. Also, big age group was significant risk factor for allergic conjunctivitis. On the other hand, male sex was insignificant risk factor. Also, Khallaf and Khalifa (2004) reported that allergic conjunctivitis was more common among boys with big age group (10-19 years), but the difference was insignificant. At the same time, Khallaf and Khalifa (2004) cleared that phylecten was more common among girls with small age group (<10 years) with insignificant statistical difference. Also, male sex was insignificant risk factor for squint (Adegbehingbe et al., 2005)

5. Conclusions and Recommendations:

We can conclude that 28.2% of the studied students had eye diseases. The most important eye diseases were trachoma (9.3%), errors of refraction (7.1%) and allergic conjunctivitis (6.3%). All eye diseases were more common in public schools. The most important significant risk factors that for eye diseases were the low level of parental occupation (OR=4.79), previous eye diseases (OR=3.35), no early consultation for eye diseases (OR=3.13), never received eye examination (OR=2.68), sibling(s) with eye diseases (OR=2.19), last birth order child (OR=1.90) and male sex (OR=1.56). Further, age

and/or sex were significant risk factors for specific eye diseases; trachoma, errors of refraction and allergic conjunctivitis. Eye diseases had a significant negative impact on school absenteeism and scholastic achievement of these students; 37.7% had significant school absenteeism 3-4 days/month (P=0.01) and 21.8% had significantly results of the first term exam; <50.0% (P=0.00) compared with their controls. Most of the risk factors of eye diseases can be manipulated. So, many of these diseases and its negative impacts can be prevented. We recommend improving personal and environmental hygienic measures, health education, and regular screening and treatment of students for eye diseases in Egypt. Also, more studies on big number of students in rural and urban areas of Egypt are recommended. Lastly, eye health component of school health services should be focused on and integrated in school health program, and this should be integrated in medical and nursing curriculums.

Corresponding author
Essam A. El-Moselhy
Department of Community Medicine, Faculty of Medicine, Al-Azhar University, Cairo, Egypt.

6. References:

1. Abdel-Wahab MF and Mahmoud SS (1987): Schistosomiasis in Egypt. Clin Trop Med Communic Dis, 2: 371-95.
2. Abdou A, Nassirou B, Kadri B, Moussa F, Munoz BE, Opong E and West SK (2007): Prevalence and risk factors for trachoma and ocular *Chlamydia trachomatis* infection in Niger. British J Ophthalmol, 91: 13-7.
3. Adegbehingbe BO, Oladehinde MK, Majemgbasan TO, Onakpoya O and Osagiede EO (2005): Screening of adolescents for eye diseases in Nigerian high schools. Ghana Med J, 39 (4): 138-42.
4. Alakija W (1995): Poor distant vision in post-primary schools in Benin City, Nigeria. Public Health, 95: 165–70.
5. Allensworth D, Lawson E, Nicholson L and Wycho J (1997): Schools and health: Our nation's investment. National Academy Press, Washington.
6. Al-Nasser AN, Sinha MNP and Ali ME (1989): Screening of eye health problems amongst school children in Riyadh. Egypt J Comm Med, 5 (2): 47-53.
7. Al-Salem M and Rawashdeh N (1992): Pattern of childhood blindness and partial sight among Jordanians in two generations. J Pediatr Ophthalmol Strabismus, 29 (6): 361-5.
8. Ajaiyeoba AI, Samaila E, Asana U and Ezepue UF (1996): Prevalence and distribution of Xerophthalmia in Nigeria. Nig J Ophthal, 4 (1):15-7.
9. Ajaiyeoba AI and Scott SCO (2002): Risk factors associated with eye diseases in Ibadan, Nigeria. African Journal of Biomedical Research, 5 (1-2): 1-3.
10. Badr I and Qureshi I (1981): Ocular status of school children in the town of Al-Majmaah, Central Province, Saudi Arabia. Saudi MJ, 2: 222-4.
11. Badr I (1982a): Community health in Saudi Arabia: Ocular status of school children in Al-Asiah, Qasim region. Saudi M J, 3: 24-7.
12. Badr I (1982b): Trachoma and Saudi Arabia. Saudi MJ, 3: 53-6.
13. Castanes MS (2003): The underutilization of vision screening for amblopia, optical anomalies and strabismus among pre school age children. Bonocul Vis Strabismus Q, (4): 217-32.
14. CDC (2005): Visual impairment and use of eye-care services and protective eyewear among children-United States, 2002. MMWR, 54: 425-9
15. Chidambaram JD, Alemayehu W, Melese M, Lakew T, Yi E, House J, Cevallos V, Zhou Z, Maxey K, Lee DC, Shapiro BL, Srinivasan M, Porco T, Whitcher JP, Gaynor BD and Lietman TM (2006): Effect of a single mass antibiotic distribution on the prevalence of infectious trachoma. *JAMA,* 295: 1142-6.
16. Cross AW (1985): Health screening in schools, Part 1. J Pediatr, 107: 487-93.
17. Courtright P, Sheppard J, Schachter J, Said ME and Dawson CR (1989): Trachoma and blindness in Nile Delta: Current pattern of projections for future in the rural Egyptian population. British J Oohthalmol, 73: 536-40.
18. Dawson CR, Daghhfous T, Messadi M, Hoshiware I and Schachter J, 1976): Severe endemic trachoma in Tunisia. British J Oohthalmol, 60: 245-52.
19. Donaldson LA, Karas MP, Charles AE and Adams CG (2002): Pediatric community vision screening with combined optometric and orthopic care: A 64-month review. Ophthalmic Physiol Opt, 22 (1): 26-31.
20. El-Masry HM, Ahmed YA, Hassan A-EA, Zaky S, Abd-Allah ES, El-Moselhy EA, Baraka YA and Abdel-Rahem MA (2007): Prevalence, risk factors and impacts of schistosomal and intestinal parasitic infections among rural school children in Sohag Governorate. Egypt J Hosp Med, 29: 617-30.
21. El-Moselhy EA, Ammar MA, Abd-Allah KM, Ismail IA and Abd-Allah ES (2005a): Epidemiological study of risky behavior and their relation wit mental ill health among secondary school students in Cairo. Egypt J Hosp Med, 19: 1-17.
22. El-Moselhy EA, El-Azab RM, Khalifa HO, Abd-Allah ES, Ebrahim AM, El-Masry HM, El-Shorbgy TS and Abo Seif HS (2005b): Epidemiological study of the childhood disabilities: A household survey in four Egyptian Governorates. Egypt J Hosp Med, 20: 66-82.
23. Farahat HG, Wasfy IA and Massoud M (1986): Pattern of eye diseases in children below age of 12 years. Bull Ophthalmol Soc Egypt, 79: 213-21.
24. Faran M and Tabbara KF (1987): The trachoma control campaign. Saudi Bull Ophthalmol, 2 (1): 78-81.
25. Ferebee A (2007): Childhood vision: Public challenges and opportunities- A policy Brief. The Center for Health and Health Care in Schools.
26. Gaynor BD, Miao Y and Cevallos V (2003): Eliminating trachoma in areas with limited disease. Emerg Infect Dis, 9: 596-8.

27. Georgy V, Fahim HI, Gaafary M and El Walters S (2006): Prevalence and socioeconomic associations of asthma and allergic rhinitis in northern Africa. Eur Respir J, 28: 756–62.
28. Hesselbarth S (2005): Socio-economic impacts of water supply and sanitation projects. http://kfw-intranet/produktion/.PDF.
29. Hunter DG (2005): Early detection vs. late treatment of amblyopia. *JAMA*, 293 (15): 1920-2.
30. Jain BK, Sudhan A and Pinto S (2005): Community participation in addressing the challenges of childhood blindness. Community Eye Health J, 18 (56): s69-s70.
31. Kalikivayi V, Naduvilath TI, Bansal AK and Dandoma L (1997): Visual impairment in school children in Southern India. India J Ophthalmol, 45: 129-34.
32. Khallaf AMA and Khalifa HO (2004): Pattern of eye diseases in a rural community, Assiut Governorate, Egypt. South Valley Med J, 8 (2): 1-16.
33. Khandekar RB and Abdu-Helmi S (2004): Magnitude and determinants of refractive error in Omani school children. Saudi Med J, 25 (10): 1388-93.
34. Kumar R, Mehra M, Dobas P, Kamlesh and Raha R (2004): A study of ocular infections amongst primary school children in Delhi. Indian J Commun Dis, 36: 121-6.
35. Loewenthal R and Pe're J (1990): The prevalence survey of ophthalmic disease among the Turk Ana Tribe. British J Oohthalmol, 74: 84-8.
36. Mariotti SP (2004): New steps toward eliminating blinding trachoma. N Engl J Med, 351: 2004-7.
37. McGill JI, Holgate ST, Church MK, Anderson DF and Bacon A (1998): Allergic eye disease mechanisms. British J Ophthalmol, 82: 1203-14.
38. Melese M, Chidambaram JD and Alemayehu W (2004): Feasibility of eliminating ocular *Chlamydia trachomatis* with repeat mass antibiotic treatments. JAMA, 292: 721-5.
39. Mohmed MA (1998): Study of the visual defects among school population (6-18 years) in Sohag. Thesis submitted for the partial fulfillment of the M.D. degree in ophthalmology. Faculty of Medicine, Al-Azhar University.
40. MOLISA (Ministry of Labour, Invalids and Social Affairs) (1998): Vietnam child disability survey 1998. Center for Information and Statistics on Labor and Social Affairs.
41. Nanthavisit U, Sornchai J and Jenchitr W (2008): Survey of refractive errors among Buddhist Scripture, Dhamma-Bali and regular school of Buddhist Novices in the Bangkok Metropolitan Area. J Med Ass Thailand, 91 (Suppl 1): 24-9.
42. Potter AR (1991):.Causes of blindness and visual handicap in the Central African Republic. British J Ophtalmol, 75: 326-8.
43. Presian MW and Norak A (1996): Baltimore vision screening project. Ophthalmol, 103 (1): 105-9.
44. Rashwan AH and Mohamed SA (1992): Trachoma infection among primary school children in Al-Koom Al-Ahmar, Kena Governorate, Egypt. Egypt J Comm Med, 10 (1): 45-52.
45. Reddy SC, Tajunisah I, Low KP and Karmila AB (2008): Prevalence of eye diseases and visual impairment in urban population: A study from University of Malaya Medical Centre. Malaysian Family Physician, 3 (1): 25-8.
46. Resnikoff S, Pascolini D and Etya'ale D (2004): Global data on visual impairment in the year 2002. Bull World Health Organ, 82: 844-51.
47. Rowe S, MacLean CH and Shekelle PG (2004): Preventing visual loss from chronic eye disease in primary care: Scientific review. *JAMA*, 291:1487-95.
48. Salem KA (1999): Vision screening program among preparatory female school students. Egypt J Comm Med, 17 (3): 79-84.
49. Shrestha RK, Toshi MR, Ghisingh R, Pradhan P, Shahya S and Rizyal A (2009): Ocular morbidity among children studying in private school of Kathmandu Valley: A prospective cross-sectional study. J Nepal Med College, 8: 43-6.
50. Solomon AW, Holland MJ and Alexander ND (2004): Mass treatment with single-dose azithromycin for trachoma. N Engl J Med, 351: 1962-71.
51. Tabbara KF, El-Sheikh HF and Shawaf SS (2005): Pattern of childhood blindness at a referral center in Saudi Arabia. Ann Saudi Med, 25 (1): 18-21.
The USAID Child Blindness Program (2007): Fostering development through the prevention and treatment of blinding eye disease. US Agency for International Development, 1300 Pennsylvania Avenue, NW Washington, DC, 20523.
52. UNICEF (2000): Egypt demographic and health survey report. UNICEF, Egypt.

12/12/2010