

## Role of the Nurse in Maintaining Healthy Physical Environment in Primary Schools in Alexandria

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**ABSTRACT:** Healthy school physical environment affects the day to day health and well being of the students. It should be organized in a way that reduces or eliminates safety hazards for all students and school personnel. The nurse collaborates with other school members to provide effective intervention to prevent the exposure of students to potentially physically harmful conditions. They must have the educational knowledge and background to be actively involved in promoting a safe healthy school environment. The present study aimed to know the role of the nurse in maintaining the healthy physical environment in primary schools in Alexandria. The study was conducted at the governmental primary schools in the seven educational zones. The study included all nurses working in 350 primary schools. The study was fulfilled through a cross-sectional approach. A total number of 251 nurses accepted to be included in the study, their mean age were  $45.87 \pm 10.61$  years, the majority of them (89.2%) were married and had children, about 57.0% had a certificate of health visitor diploma. The results showed that knowledge, attitudes and practices of nurses regarding maintaining healthy school physical environment are adequate in some aspects and inadequate in another. As regards knowledge, only one quarter of nurses has the required knowledge, while one third of them did not have enough knowledge. However, there were unsatisfactory attitudes and practices in maintaining healthy school physical environment. The study revealed that a significant positive relationship was found between knowledge of nurses and their qualifications and marital status.

**Key words:** school physical environment, knowledge, attitudes and practices, of the school nurse

### INTRODUCTION

School children constitute a major expansion of cognitive and social skills. human resource in any community. The The school is the second home among the period of life from 6-12 years is primary places that children spend their characterized by steady physical growth, time.<sup>(1)</sup> The school environment when neuromuscular refinement, and rapid properly organized and well established

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and maintained will have a promoting effect on students' growth and development.<sup>(1-3)</sup>

A healthy school environment is one that promotes optimum psychosocial and physical growth and development among school-age children and school personnel. It provides an atmosphere that fosters sound mental health and favorable social conditions.<sup>(4)</sup> The school environment has both physical and psychosocial aspects. Physical concerns include sanitation, heating, lighting, and safety issues.<sup>(5)</sup> Factors that contribute to the physical environment include the school building, biological or chemical agents that may be detrimental to health, and physical conditions such as temperature, humidity, electromagnetic radiation, mechanical vibration, noise, lighting, and heat play a negative role.<sup>(6)</sup>

Physical aspects of the environment need to be monitored to ensure an optimal setting for student's learning. It should be organized in a way that reduces or

eliminates safety hazards for all students and school personnel.<sup>(7)</sup>

School nurses are important members in the health team of the school. School nurses are not just bandage dispensers, first aid providers, and record keepers. The nurses' skills and training prepare for broader roles as health counselors, facilitators, and educators within the school and community.<sup>(8)</sup> The school nurse, through assessing the physical environment of the school, takes actions to improve health and safety.<sup>(9)</sup> She participates in healthy school environment by monitoring, reporting, and intervening to correct hazards, and collaborating to develop a crisis intervention plan.<sup>(10)</sup>

The nurse assesses both the internal and external physical environment of the school.<sup>(11)</sup> They must have the educational knowledge and background to be actively involved in promoting a safe healthy school environment. They should also have formal training in health

education and an understanding of the health needs of all children in schools.<sup>(4)</sup>

To address this role, this study aims to assess the knowledge, attitudes and practices of the school nurses about the school healthy physical environment in the primary schools in Alexandria governorate.

### **SUBJECTS AND METHODS**

A cross-sectional design was used. The study was conducted in the governmental primary schools of the seven educational zones of Alexandria Governorate. The study included all nurses (251 nurses) working in 350 primary schools.

#### **Data collection methods**

The following tools were used for collecting study data:

#### **I. A structured interview sheet was applied in collecting the information required from nurses:**

- **Personal and social data;** such as age, marital status, whether she had children or not, qualifications, years of experience in

school health, number of schools and students which the nurse is responsible for and type and number of training courses in school health.

#### **- Nurse's knowledge regarding school healthy physical environment;**

nurses were asked about definition and components of the school health program, school health team, definition of the school health environment, questions about water supply, sewage disposal, ratio of water closets to students, frequency of cleaning water closets, collecting garbage of the playground & of the classrooms, total collecting garbage of the school, characteristics of the playground, lighting & ventilation of classrooms, characteristics of proper writing board, fitness of student desks, safety of school stairs, school corridors, canteen and safety program. A special scoring system was prepared and applied to assess their knowledge. Collective knowledge scores equals "77" points and was leveled as follows: very good

for 58 – 77, good for 39- < 58, average for 31 - < 39, and poor for < 31.

- **Nurse's attitude** regarding activities related to her role in maintaining healthy physical environment in primary schools was scored using the Lickert scale.<sup>(12)</sup> This part included 34 items towards school hygiene, sanitation in the school, playground, classrooms environment, canteen, safety program for students and nurse supervising of school environment. Each question scored (5) degrees. The nursing attitude total score equals "170" and was leveled as follows; good attitude had a score "114-170", fair attitude had a score "57-<114" and poor attitude had a score "< 57".

- **Nurse's Practice** by questioning them, they were asked about:- Keeping healthful school physical environment by daily reporting, checking of the school playground, classrooms, bathrooms, refuse disposal and water supply, canteen, corridor, procedures, and recoding daily reports.

**II- Observation of school physical environment:-**

- An observation checklist was used for a sub sample of the schools visited for nurses presenting 10% of the total number of schools of the study sample. The sub sample was selected randomly from the total selected schools and equaled 35 schools. Five schools from each zone represented all the seven districts. Each school was visited 3 times for observation. The researcher was inspecting the major school physical environmental items. The checklist included the following: observation about classrooms, water supply and toilets, playground, stairs and corridors, canteen, and clinic room.

**Statistical analysis:**

The arithmetic mean, standard deviation, and Mont Carlo P test were used to analyze the data of this study.

**RESULTS:**

**Sample characteristics:**

The present study comprised 251 nurses, more than half (55.4%) of them aged 50-<60 years, with a mean age of 45.87±

10.61 years, the majority of nurses (89.2%) were married and had children. About (57.0%) of nurses had a certificate of health visitor diploma, the majority (76.1%) of nurses had experience in working at schools for 20 years or more, (64.5%) were responsible for two schools. Concerning number of students in their responsibility, 31.1% of them were responsible for less than 750 students, while (24.7%) were responsible for 750-<1000 students and the same rate for 1000-< 1500 students. It was observed that, the association between knowledge score and educational qualifications of nurses and marital status and state of having children, is statistically highly significant (MCP = 0.00).

#### **Nurses knowledge regarding school health program and healthy school physical environment.**

As shown in table (1) that the higher rates of correct answers (above 50%) concerned "frequency of cleaning water closets daily" (95.2%), "collecting the

playground garbage" (88 %) , "ratio of hand wash basins to students" (62.5%) and "ratio of school water closets to students"( 54.6%).

While low and very low rates of correct answers ranged from (0.4% to 29.1%) for the other items, which included (0.4%) for items of "Characteristics of the safe playground", "Safety of school stair cases", and "Safety of the corridors". Also, a rate of (0.8%) for "Providing the school with safe water", "Writing board characteristics", " Fitness of student desks", and "Criteria of healthy school canteen". Also, only (1.2% and 2.0% respectively) for classroom illumination and ventilation. The mean rate of correct answers was  $42.91 \pm 74.47$ .

Also, the table shows that, the majority of nurses above (75.0 %) gave correct answers but incomplete about the definition, components of school health program and the definition of healthy school physical environment. Followed by 68.5% about the school health team.

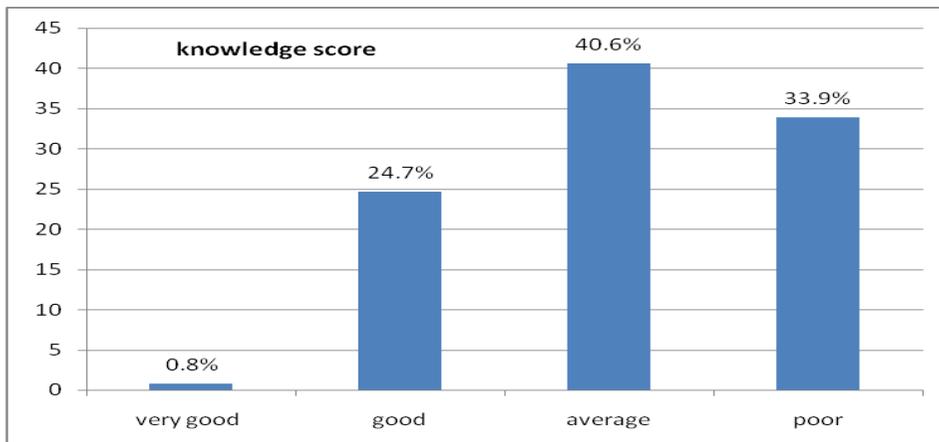
**Table (1): Distribution of nurses by their knowledge regarding school health program and healthy school physical environment**

Knowledge Items	Correct answers		Incomplete answers		Incorrect answers and don't know	
	No.	%	No.	%	No.	%
<b><u>School health program:-</u></b>						
- Definition of the school health program	9	3.6	200	79.7	42	16.7
- Components of the school health program	22	8.7	211	84.1	18	7.2
- School health team	73	29.1	172	68.5	6	2.4
-Definition of healthy physical school environment	8	3.2	211	84.1	32	12.7
<b><u>Water supply:-</u></b>						
- Providing the school with safe water.	2	0.8	241	96.0	8	3.2
- Acceptable hand wash basins	5	2.0	227	90.4	19	7.6
- Ratio of hand wash basins to students	157	62.5	19	7.6	75	29.9
<b><u>Sewage disposal:-</u></b>						
- Criteria of healthy water closets	7	2.8	243	96.8	1	0.4
- Ratio of school water closets to student	137	54.6	4	1.6	110	43.8
- Frequency of cleaning water closets daily	239	95.2	7	2.8	5	2.0
<b><u>Sewage disposal:-</u></b>						
- Criteria of healthy water closets	7	2.8	243	96.8	1	0.4
- Ratio of school water closets to student	137	54.6	4	1.6	110	43.8
- Frequency of cleaning water closets daily	239	95.2	7	2.8	5	2.0
<b><u>Refuse disposal:-</u></b>						
- Collecting the playground garbage	221	88.0	23	9.2	7	2.8
- Collecting the classroom garbage	6	2.4	224	89.2	21	8.4
- Collecting the whole school garbage	38	15.1	210	83.7	3	1.2
<b><u>Playground:-</u></b>						
- Characteristics of the safe playground	1	0.4	249	99.2	1	0.4
<b><u>Classroom environment:-</u></b>						
- Illumination	3	1.2	212	84.5	36	14.3
- Ventilation	5	2.0	243	96.8	3	1.2
- Writing board characteristics	2	0.8	191	76.1	58	23.1
- Fitness of Student Desks	2	0.8	247	98.4	2	0.8
<b><u>Safety of School Stairs:</u></b>						
- The school stair cases	1	0.4	222	88.4	28	11.2
<b><u>School corridors :</u></b>						
- Safety of the corridors	1	0.4	222	92.8	17	6.8
<b><u>School canteen</u></b>	2	0.8	246	98.0	3	1.2
- criteria of healthy school canteen	2	0.8	246	98.0	3	1.2
<b><u>Safety programs:</u></b>						
- Components of school safety program	3	1.2	114	45.4	134	53.4
Mean $\pm$ SD=	42.91 $\pm$ 74.47				28.59 $\pm$ 36.22	

(n) = 251

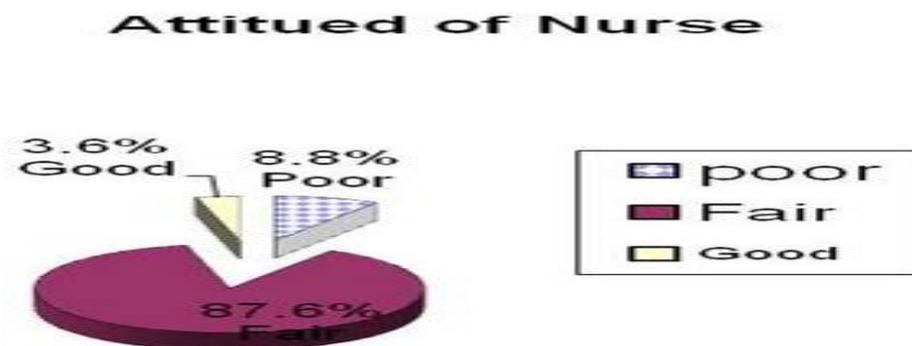
As regards overall knowledge score of and healthy physical school nurses about the school health program environment:

Figure (1) shows that (40.6 %) of nurses scored average knowledge, (24.7%) had good scores, and only 2 of the nurses (0.8%) scored very good. (33.9%) scored poor.



**Figure (1):** Distribution of nurses by their overall knowledge score about the school health program and healthy physical school environment.

Regarding overall attitude score of nurses towards keeping healthy school environment: Figure (2) shows that the majority of nurses (87.6%) scored fair attitude, (8.8%) scored poor, and only (3.6%) nurses scored good.



**Figure (2):** Distribution of nurses by their overall attitude score towards keeping healthy school environment

**As regards nurses' practices (by questioning) to maintain healthy physical environment:**

As shown in table (2) that the daily recording of the school physical environment by nurses was done mainly by writing in block note (67.3%) then by filling of printed sheets (42.2%). The computer is never mentioned by nurses.

Regarding to whom the daily records is presented the table shows that the majority of them (84.1%) reported they presented their records to a specialized committee, while (21.9%) reported to physician, and only (5.2 %) to the school manager.

Considering their observation of playground, (90.4%) of nurses stated they observe that garbage boxes are covered or

not, (76.1%) were keen to observe general cleanliness of the playground, and (70.9%) emphasized that the playground should be free from accident agents.

As regards their practice concerning of school sanitation, the table shows that most of nurses (90.4%) stated they observe cleanliness of hand wash basins and water closets, and the majority of them (76.1%) observe it to ensure presence of potable water, and (70.1%) of nurses stated they observe working flushing water of siphons.

On the same table, (84.9%, 78.9 %, 71.3% and 70.1%, respectively) reported they used to inspect classes for absence of bad odors, cleanliness, absence of broken students desks, and nonworking electric lamps.

**Table (2): Distribution of nurses by their practices (by questioning) to maintain healthy physical environment.**

Practices of nurses for maintaining healthy school physical environment	Frequency	
	No.	%
<b>1-Daily recording and reporting of healthy physical environment:-</b>		
<b>A) Methods of recording :-</b>		
1- Writing in a block note or piece of paper	169	67.3
2- Filling of printed sheets	106	42.2
3- Computer	0	00.0
<b>B)Reporting to whom:-</b>		
1-School manager	13	5.2
2- Physician	55	21.9
3-Specialized committee	211	84.1
4-Others ( teachers, nursing supervisor, parents teachers association )	37	14.7
<b>2-Inspection of playground to ensure:-</b>		
A) General cleanliness	191	76.1
B) Presences of covered garbage boxes	227	90.4
C) Presences of plastic bags in garbage boxes	172	68.5
D) Free from accidents agents	178	70.9
<b>3-Inspection of school sanitation to ensure :-</b>		
A) presence of potable water	191	76.1
B) cleanliness of hand wash basins and water closets	227	90.4
C) presence of soap in hand wash basins	172	68.5
D) working flushing water of siphons	176	70.1
E) Others ( bad odor)	2	0.8
<b>4- Inspection of classrooms environment to ensure:-</b>		
A) Cleanliness of classes	198	78.9
B) Absence of bad odors	213	84.9
C) Absence of broken students desks	176	70.1
D) Nonworking electric lamps	179	71.3
E) Presence of broken window glasses	42	16.7
F) Others (absence of uncovered wires – absence of insects –illumination)	7	2.8

n=251 \*Number do not add to 100% due to multiple responses

### **Assessing school physical environment by observation.**

**Table (3): Shows observations of the classrooms.**

The table reveals that only (45.7 %) of the sample of schools had clean classes

with present bad odor of classes in 40% of schools. In about (77.1%) of the sample there was a garbage box in the classes, but with no plastic bags inside them. The desks in the classes were not enough for the students in (60 %).

The same table shows that in more than half (57.1%) of schools "the distance between the writing board and the first row of desks was more than one meter".

The writing board was found in a good state in only 57.1% of schools and

reflected light or glare on the boards was reported in 22.9% of schools.

As regards window glasses some were found broken in 31.4% of schools and intact working electric lamps were absent in 25.7% of schools.

**Table (3): Observations of classrooms.**

Classrooms items	Frequency n=35	
	No.	%
<b><u>The general cleanliness of classes</u></b>		
Good	16	45.7
Moderate	11	31.4
Bad	8	22.9
<b><u>Odor in the class rooms</u></b>		
present	14	40.0
Absent	21	60.0
<b><u>Is there a garbage box in the class?</u></b>		
No	8	22.9
Yes	27	77.1
<b><u>The desks in the class are enough for the students</u></b>		
Enough	14	40.0
Not enough	21	60.0
<b><u>The distance between the writing board and the first row of desks</u></b>		
Less than 1 meter	11	31.4
1 meter	4	11.4
More than 1 meter.	20	57.2
<b><u>The writing board in a good state.</u></b>		
No	15	42.9
Yes	20	57.1
<b><u>There is a reflection of light or glare on the board</u></b>		
No	27	77.1
Yes	8	22.9
<b><u>Is there a broken window glasses?</u></b>		
No	24	68.6
Yes	11	31.4
<b><u>Intact working electric class lamps</u></b>		
No	9	25.7
Yes	26	74.3

**Table (4): Shows the observations of water supply and water closets.**

The table shows that only (8.6 %) of the sample of schools had clean water closets, and none of them had garbage box and plastic bags and 48.6% of flushing system of siphons were not working.

As regards hand wash basins only 22.8% were considered clean, where 48.6% were obstructed and 14.3% with non working water taps. There was complete absence of soap and drying papers in all schools.

**Table (4): Observations of water supply and water closets.**

Water supply and water closets items	Frequency n=35	
	No.	%
<b><u>The general cleanliness of the water closets</u></b>		
Good	3	8.6
Moderate	16	45.7
Bad	16	45.7
<b><u>Presence of garbage box</u></b>		
No	35	100.0
yes	00	00.0
<b><u>Condition of water closets</u></b>		
Working	12	34.3
Obstructed	23	65.7
<b><u>Working flushing systems of siphons</u></b>		
Working	18	51.4
Not working	17	48.6
<b><u>Cleanliness of hand wash basins</u></b>		
Good	8	22.8
Moderate	10	28.6
Bad	17	48.6
<b><u>Condition of hand wash basins</u></b>		
Not obstructed	18	51.4
Obstructed	17	48.6
<b><u>Working water taps</u></b>		
Working	30	85.7
Not working	5	14.3
<b><u>Presence of soap</u></b>		
Absent	35	100.0
<b><u>Presence of dring paperd</u></b>		
Absent	35	100.0

**Table (5): Shows the observations of playgrounds, stairs and corridors.** present in 25% of school playgrounds. The table also shows that stair cases of

As regards the playgrounds of the sample of schools only 31.4% were considered clean with garbage barrels present in all of them (32 schools) but with no plastic bags. Ground obstacles were 22.9% of schools were considered clean and intact in 52.9 % with intact handrails in 88.2%. Corridors were considered clean in 17.1 % of schools and free from obstacles in 80.0 % of sample schools.

**Table (5): Observations of playgrounds, stairs and corridors.**

Items	Frequency	
	No.	%
<b><u>The general cleanliness of the playground (n=35)</u></b>		
No playground in the school	3	8.6
Good	11	31.4
Moderate	15	42.9
Bad	6	17.1
<b><u>Is there a garbage barrel (n=32)</u></b>		
Yes	32	100
<b><u>Dangerous ground obstacles in the playground (n=32)</u></b>		
No	24	75.0
Yes	8	25.0
<b><u>Cleanliness of stairs (n=35)</u></b>		
No stairs	1	2.9
Dirty	7	20.0
Moderate clean	19	54.2
Clean	8	22.9
<b><u>Intact stair cases ( n=34)</u></b>		
No	16	47.1
Yes	18	52.9
<b><u>Intact handrails ( n=34)</u></b>		
No	4	11.8
Yes	30	88.2
<b><u>Cleanliness of corridors in the school (n=35)</u></b>		
Dirty	8	22.9
Moderate clean	21	60.0
Clean	6	17.1
<b><u>Corridors free from dangerous obstacles (n=35)</u></b>		
No	7	20.0
Yes	28	80.0

**Table (6): Observations of the school canteen**

The table reveals that 22.9 % of sample schools canteens were clean with a garbage box with plastic bags in only (13.3%) of them. Clean hand wash basin

was present in only one of the 15 canteens reported from the total number of schools with soap present in 2 basins only. While insects were seen in 2 canteens, the food items were covered in all reported school canteens.

**Table (6): Observations of the canteen**

Canteen items	Frequency	
	No.	%
<b><u>The general cleanliness in the canteen (n=35)</u></b>		
No canteen in the school	20	57.1
Bad	3	8.6
Moderate	4	11.4
Good	8	22.9
<b><u>Is there a garbage box? *</u></b>		
No	7	46.7
Yes	8	53.3
<b><u>If the answer is yes there is a plastic bag inside it *</u></b>		
No	13	86.7
Yes	2	13.3
<b><u>Presence of hand wash basin *</u></b>		
No	11	73.3
Yes and dirty	3	20.0
Yes and clean	1	6.7
<b><u>Presence of soap (n=4)</u></b>		
No	2	50
Yes	2	50
<b><u>Insects detected in the canteen *</u></b>		
No	13	86.7
Yes	2	13.3
<b><u>Food items *</u></b>		
Covered	15	100

\*(n= 15)

**Table (7): Shows the state of clinic room by observations.**

The table shows absence of any clinic room in 21 of sample schools (60%). Only

34.3% were considered clean with the presence of hand wash basins in 28.6 % of the rooms which were considered clean

with presence of soap in four clinics rooms examination bed and first aid cabinets were only. In about (92.8%) of the sample there present in all reported clinic rooms (14 was a garbage box with plastic bags. An schools).

**Table (7): Observations of clinic room**

Clinic room items	Frequency	
	No.	%
<b><u>The general cleanliness of the school clinic (n=35)</u></b>		
No clinic present	21	60.0
Moderate	2	5.7
Good	12	34.3
<b><u>Presence of hand wash basin*</u></b>		
No	10	71.4
Yes	4	28.6
<b><u>Cleanliness of hand wash basin*</u></b>		
Bad	10	71.4
Good	4	28.6
<b><u>Presence of soap*</u></b>		
No	10	71.4
Yes	4	28.6
<b><u>Is there a garbage box*</u></b>		
No	1	7.2
Yes	13	92.8
<b><u>If the answer is yes there is a plastic bag inside it *</u></b>		
No	1	7.2
Yes	13	92.8
<b><u>Presence of an examination bed and first aid cabinets*</u></b>		
Yes	14	100.0

\* (n=14)

## DISCUSSION:

A safe, clean, and well-maintained school with a positive psychosocial climate provides the students with good self-esteem and enhances the learning process. The school physical environment affects the day –to – day health and well being of the students.<sup>(13)</sup> The nurse collaborates with other school members to provide effective interventions to prevent the exposure of children to potentially physically harmful conditions. Management of the school

physical environment is one of her important functions. She observes the physical hazards and is responsible for securing correction of undesirable and unsafe conditions.<sup>(14)</sup>

The quality of the school health program operated within such standards of nursing care is dependent upon many factors. One of them is the proportion or ratio of the school nurse is very important, number of students in her responsibility. In U.S.A the National Association of School Nurses (NASN) in 1995 recommended the ratio of nurse to students as 1:750.<sup>(5,15)</sup> In California State it was recommended as one school nurse for every 1000 students.<sup>(15)</sup> In this study, the results revealed that the ratio is one nurse /1000 and more students for about 44.2% of the studied nurses.

**\*Nurses Knowledge regarding school health program and school health environment:-**

If the nurses are able to recognize and

identify the influences of school physical environment on the health and well being of the students, they can participate in the activities of promotion of the environment and prevention of hazards that might affect the health of the students. Nurses must have the correct knowledge and background to be actively involved in promoting a safe healthy physical school environment.<sup>(16)</sup>

Regarding the overall knowledge score of the nurses, the present study revealed that the highest rate of nurses had average knowledge score while a quarter of them had very good and good knowledge score. These findings are in harmony with Saleh (2007)<sup>(17)</sup> who reported that the majority of nurses scored an average level of knowledge.

The school health program is an integrated set of planned, sequential, school-affiliated strategies, activities, and services designed to promote the optimal physical, emotional, social, and educational

development of students.<sup>(15)</sup> Results of the present study revealed that the majority of nurses almost gave correct but incomplete answers, while only 3.6 % gave correct answers regarding definition of school health program. These results are in agreement with the results of a similar study conducted by Saleh in Alexandria (2007)<sup>(17)</sup> who found 88.9% of nurses had incomplete answers, and none of them gave correct answers.

Three components have persisted as a means of meeting the health needs of the school-age children are referred to as school health program; these are school health services, school health instructions and the healthful physical school environment.<sup>(18)</sup> The results indicated that the knowledge regarding to the components of the school health program, most of the nurses gave correct, but incomplete answers. On the same line, Mohamed' study, in Alexandria (1995)<sup>(19)</sup> revealed that the 68.1% gave correct

answers about the components of the school health program.

The ideal school health team would include representation from: administrators, medical personnel, (especially a school nurse and school physician), social workers, counseling personnel, teachers, food service workers, maintenance workers, and parents.<sup>(20)</sup> The nurse must collaborate with other team members to insure the environmental safety at school.

As regards to the school health team, in this study, it was found that the highest percentage of the nurses had correct but incomplete answers regarding the member of the health team. In a study done in Alex (2007)<sup>(17)</sup> it was found that most of the studied nurses gave incomplete answers about health team members and only 10% of them nurses answered correctly regarding this issue. In Egypt, the school health team includes the physician, the school nurse or health visitor, teacher, the dentist, and the social worker.<sup>(21)</sup>

Also, the results revealed that the majority of the sample gave correct but incomplete answers about the definition of healthy physical school environment. This may be considered satisfactory results although Pollock and Middleton (1991).<sup>(22)</sup> mentioned that the healthy physical school environment is one that promotes optimum psychosocial and physical growth and development among school-age children.

Students spend most of the school day in the classrooms. When the classroom environment is healthy, the children are more likely to learn much more. Therefore, illumination, ventilation, and class furniture are very important elements for the learning process.<sup>(23)</sup> In the present study, the vast majority of nurses gave correct but incomplete answers regarding importance of good illumination and ventilation. This finding was in agreement with the results of similar study in Alex (2007)<sup>(17)</sup> which concluded that the majority of nurses gave correct and semi-correct answers

concerning the importance of healthy physical school environment.

Fitness of the student's desk, good posture are necessary for preventing early fatigue causing distraction of the school child. Wheatly and Hallock (1965)<sup>(24)</sup> said that good position is necessary for preventing early fatigue, which causes spine deformities especially scoliosis. In the light of the data presented in this study, it was indicated that only 0.8% of the nurses knew the proper fitness of the desks to the students. The reason of that may be because they did not have enough authority in this aspect.

A minimal distance between the writing class-room board and first line of desks is required as a safe guard for prevention of eye strain and fatigue of children. In a study done in Alex, Fahmy *et al.*, (1974)<sup>(25)</sup> found that this was not accomplished in a big proportion of the study classes. In Alexandria, many public primary schools still use the chalkboard as an educational aid,

so the risk of chalk dust is still present. The results of this study revealed that only 0.8% of the nurses knew the correct answer about it, this may be because they don't feel that it is their responsibility.

As regards to the environmental sanitation, Creswell, and Newman (1993)<sup>(26)</sup> stated that school authorities are responsible for providing a safe and adequate water supply for school use. In addition to being free from contamination, water should be palatable and sufficient.<sup>(27)</sup>

In the present study 96.0% of nurses gave correct but incomplete answers about the provision of the school with suitable safe water.

The study revealed that a significant positive relationship was found between knowledge of nurses and their qualifications and marital status. Nurses having bachelor degree of nursing and nurses having technical health diploma were able to answer the knowledge questions correctly. This may be due to the

fact that they are wisely affected by their marital status and having children, they know how to deal and interact with the children and school physical environmental especially in the primary schools.

**\*Nurses attitudes regarding healthy physical school environment:-**

"Attitude" is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation. School nurses participate in healthy school physical environment by monitoring and intervening to correct physical hazards. Nurses attitude influence their choice of action and responses to challenges.<sup>(9)</sup>

Nurses must have good knowledge and attitude to be actively involved in promoting school environment. The present study showed that the majority of nurses scored fair attitude and 40% of them scored average knowledge in maintaining school physical environment. Findings of this study are in harmony with

Saleh (2007)<sup>(17)</sup>, who reported that the major score sector of nurses scored an average level of knowledge.

Creswell, and Newman (1993)<sup>(26)</sup>, stated that the relation between knowledge, attitudes, and behaviors are unclear. Although it is logical to assume that these relationships exist, it has not been shown. For example, the change in knowledge will result in a change in attitude or that a change in attitudes necessarily predicts a change in behavior. Attitudes can exist in the absence of supporting knowledge and behaviors can exist in the absence of attitude and knowledge as to why the behavior is carried out.

**\*Nurses practice regarding school healthy physical school environment (by questioning and on site observation)**

As regards their performance in keeping records, the results found that the majority of nurses presented their reports to a specialized committee. On the same

line, Saleh study (2007)<sup>(17)</sup>, indicated that the school nurses had adequate performances as regards recording and reporting data.

Shamma (1999)<sup>(28)</sup> stated, that there is a growing consensus in Egypt that school physical environment must be safe and clean. School playground area should be protected from slippery floors and concrete grounds. It has to be big, wide, slippery materials and away from other environmental hazards. The present study indicated that the majority of nurses gave good answers about this statement. This finding is supporting the results of the study done by of Saleh (2007)<sup>(17)</sup>, who reported that a high percentage of nurses inspect the school playground. The nurse should detect hazardous conditions in the classrooms, in the playground, and else where in the school, she can take appropriate action to eliminate or correct such condition. There must be a suitable plan to provide a suitable measure to be

used in emergency conditions and to ensure the absence of physical hazards, the presence of emergency kit, the maintenance and the prevision of student's records, safe playground and safe stairs conditions. Telephone communication must be available and so the telephone numbers of the district hospitals and parents.<sup>(29)</sup>

The physical qualities of classroom among many other effective agents can be considered of the most important factors influencing the achievement of the attending school child.<sup>(30)</sup> On the site observation involving the physical environment of a sub sample of the schools, it was found that highest percentage of the schools had clean classes. Findings of this study are in harmony with Tawila et al., in Egypt (2000)<sup>(31)</sup> who reported that 72 % were clean.

However, the present study revealed that only 8.6 % of the sample of schools had clean water closets (WCs), this finding

is in accordance with the study of EL-Din et al., (2006)<sup>(27)</sup> in Alexandria, which showed that more than 60% of the study sample perceived the WCs in schools as unclean.

As regards hand wash basins observation, only 22.9% were considered clean. This finding is in contrast with the previous study in Alexandria (1997)<sup>(32)</sup> who stated that 60% of hand wash basins were clean.

School playground must be kept clean and devoid of all hazards as pits and collections of stones. At the same time, there should be adequate supervision. Unprotected posts, gravel-covered playing surfaces, poor drainage allowing mud to accumulate, slippery concrete surfaces, hedges and trees that scratch, uneven surfaces, and poorly constructed or supervised play equipment constitute significant environmental hazards.<sup>(26)</sup> The present study showed that most of the playground are clean and free from

hazards.

The school canteen is needed in schools as it supports healthy meals for students. It should be promoted and endorsed. This would be presented through a whole-school approach to nutrition-providing information on food, nutrition and healthy eating habits.<sup>(11)</sup> In the present study, the majority of the schools sample had clean school canteen with almost have few hand wash basins. Such result agreed with a study done in Alexandria (1997).<sup>(32)</sup>

The health clinic for emergency care in schools should contain suitable equipments and supplies.<sup>(29)</sup> The present study, revealed that the majority of the studied schools did not have any special clinic room and one third had examination bed. This results were similar to Saleh study (2007)<sup>(17)</sup>, who stated that the furniture needed in school clinics was not completed in respect to the presence of a bed for emergency and hand washing

facilities.

As regards the school corridors the present study revealed that corridors were considered free from obstacles in 80.0% of sample schools. Connor (2009)<sup>(33)</sup> reported that clean corridors with no slipping, no projecting water fountains or any furniture must be considered for the children safety.

#### **CONCLUSION AND RECOMMENDATIONS:**

The results of the present study revealed that knowledge, attitude and practices of nurses regarding maintaining healthy school physical environment are adequate in some aspects and inadequate in another. As regards knowledge, only one quarter of nurses has the required knowledge, while one third of them did not have enough knowledge. However, there were unsatisfactory attitudes and practices in maintaining healthy school physical environment. Based on results of the present study and in view of the previous conclusions, the following recommendations

are suggested:- Continuous in-service education program for nurses regarding their role in promoting the school physical environment to update their knowledge and improve their performance, nurses who are graduated from technical health institute and faculty of nursing must be encouraged to join the field of school health nursing. Review of performance standard of the school nurse will give a chance to correct their knowledge and practices regarding the studied issue. Production of manual school health nursing or handbook to help nurses in performing their job efficiently and regular supervision on the school nurses practices to get better performance.

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