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**Effect Of Slum Environment On Child Health In
Ali Ibntalp Primary School- Khartoum Locality**

A research Submitted to fulfillment for Requirements of Master Degree in Nursing

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إستهلال

قال تعالى:

﴿ مَا يُرِيدُ اللَّهُ لِيَجْعَلَ عَلَيْكُمْ مِنْ حَرَجٍ وَلَكِنْ يُرِيدُ لِيُطَهِّرَكُمْ وَلِيُتِمَّ نِعْمَتَهُ عَلَيْكُمْ

لَعَلَّكُمْ تَشْكُرُونَ ﴾

(سورة المائدة: الآية 6)

DEDICATION

This study dedicated to my dear father and my dear mother. Also I would like to dedicate this work to my dear lovely daughter Rana, and to my dear husband.

ACKNOWLEDGEMENT

I am grateful to University of Shendi for giving us the valuable chance to be of their students in this master program. I would like to express my appreciation, first and foremost to my supervisor Dr. *Mohammed Gaberadar*, who helped me and offered his valuable guidance to complete this study. Finally, I must acknowledge administration, teachers and pupils at Ali Ibn AbiTalp Primary School who help me to collect data or this study. As well the librarians, many friends, colleagues

Table of Contents

| Items | Page No. |
|--|--------------|
| إستهلال | I |
| Dedication | II |
| Acknowledgement | III |
| Table of contents | IV |
| List of tables | VI |
| List of figures | VII |
| Abstract | VIII |
| Abstract in Arabic | IX |
| 1. CHAPTER ONE : Introduction | 2-4 |
| 1.1 Introduction | 2 |
| 1.2 Justification | 3 |
| 1.4 Objectives | 4 |
| 2. CHAPTER TWO: Literature Review | 6-14 |
| 2.1 Literature Review | 6 |
| 2.2 Previous Studies | 15 |
| 3.CHAPTER THREE: Methodology | 19-21 |
| 3.1 Study design | 19 |
| 2.2 Study Area | 19 |
| 2.3 Study population | 19 |
| 2.4 Inclusion criteria | 19 |
| 2.5 Sample size | 19 |

| | |
|--|--------------|
| 2.6 Sampling technique | 20 |
| 2.7 Variables | 20 |
| 2.8 Data Collection Method | 20 |
| 2.9 Method of data analysis | 20 |
| 2.10 Ethical Considerations | 21 |
| 2.11 Study Limits | 21 |
| 4. CHAPTER FOUR: Results | 23-34 |
| 4.1 Results | 23-34 |
| CHAPTER FIVE Discussion, Conclusion & Recommendations | 36-39 |
| 5.1 Discussion | 36 |
| 5.2 Conclusion | 39 |
| 5.3 Recommendations | 39 |
| References | 40 |
| Appendixes | |

List of Tables

| Table No. | Table title | Page No. |
|-----------|---|----------|
| 1 | Distribution of children according to age. | 23 |
| 2 | Distribution of children according to type of family. | 23 |
| 3 | Distribution of children according to family income. | 24 |
| 4 | Distribution of children according to method of hand washing. | 25 |
| 5 | Distribution of children according to frequency of bathing. | 26 |
| 6 | Distribution of children according to accessible health Service. | 27 |
| 7 | Distribution of children according to place of vaccination. | 27 |
| 8 | Distribution of children according to smoking. | 28 |
| 9 | Distribution of children according to health problems related to digestive system | 29 |
| 10 | Distribution of children according to health problems related to respiratory system | 29 |
| 11 | Distribution of children according to health problems related to dermatology | 30 |
| 12 | Distribution of children according to health problems related to general appearance | 30 |
| 13 | Distribution of children according to general appearance | 31 |
| 14 | Distribution of children according to Behavior measures | 31 |
| 15 | Slums environmental factors | 32 |
| 16 | slums environment safety | 32 |
| 17 | Distribution of children according to growth measurements | 33 |
| 18 | association between school environment and the children physical status | 33 |
| 19 | Association between school environment and the children behavior | 34 |

List of Figures

| Figure No. | Figure title | Page No. |
|-------------------|--|-----------------|
| i | Distribution of children according to order | 24 |
| ii | Distribution of children according to children live with | 25 |
| iii | Distribution of children according to Time of washing | 26 |
| iv | Distribution of children according to unhealthy habits. | 28 |

Abstract

Background: A slum environment, as defined by United Nations Habitat, is a household that may suffer one or more of the following conditions: lack of access to water protected from outside contamination, lack of access to sanitation facilities that separate human waste from human contact and lack of adequate living area.

Objective: This study aimed to study effect of Slum environment on child Health in Ali Ibn Abe Talp Primary School- Khartoum Locality, 2018.

Methods: This is a descriptive full coverage intentional sample study conducted at Effect of Slum environment on child Health in Ali Ibn Talp Primary School- Khartoum Locality. The study sample consisted of (40) children from two levels (5TH and 6TH). A structured end-closed questionnaire used to collect data from study sample by face-to-face interview. The questionnaire included three parts; socio-demographic and part two and three related to slum environment physical and psychological effects on children. The data statistically analyzed by using (SPSS) software to tabulate frequencies and percentages children responses, also Chi-square tests carried out to test significance of associations.

Results: the slum environment had bad sources of healthy drinking water. There was significant association between school environment and physical health (digestive- respiratory problems and dermatology status (p -value = 0.001 , α = 0.05). and also a significant association between school environment and psychological health (Anxiety, Self-esteem and Aggressive behavior) (p -value = 0.114 , α = 0.05).

Conclusion: slum environment at school was bad regarding source of drinking water, source of eating, safe electricity and fire sources.

Recommendations: Provision school nursing is necessary for children health and health units of well- infrastructure. Educate or conduct awareness program to both mothers and children about self-hygiene measure.

المستخلص

خلفية : البيئة العشوائية كما عرفتھا الأمم المتحدة، هي بيئة قد تعاني من واحد أو أكثر من الحالات التالية: عدم الحصول على المياه الخالية من التلوث الخارجي، وعدم الوصول إلى مرافق الصرف الصحي التي تفصل النفايات البشرية عن الاتصال البشري وعدم وجود منطقة معيشة مناسبة.

الهدف: هدفت هذه الدراسة إلى دراسة تأثير البيئة العشوائية على صحة الطفل في مدرسة علي ابن أبي طالب الابتدائية - محلية الخرطوم، 2018.

الطرق والأدوات: هذه دراسة وصفية مقطعية أجريت في تأثير بيئة الأحياء الفقيرة على صحة الطفل أجريت على عينة قصدية من التلاميذ بمدرسة علي ابن أبي طالب الابتدائية - محلية الخرطوم. تكونت عينة الدراسة من (40) طفلاً من المستويين (5 و 6). تم استخدام استبيان مغلق النهايات لجمع البيانات من عينة الدراسة عن طريق المقابلة الشخصية. تضمن الاستبيان ثلاثة أجزاء؛ الخصائص الاجتماعية والديموغرافية والجزء الثاني والثالث المتعلقة بالبيئة العشوائية والآثار الجسدية والنفسية على صحة الأطفال. تم تحليلها إحصائياً باستخدام برنامج (SPSS) بجدولة التكرارات والنسب المئوية لاستجابات الأطفال، كما أجريت اختبارات مربع كاي لاختبار لمعرفة معنوية الارتباطات.

النتائج: تحتوي البيئة على مصادر سيئة لمياه الشرب الصحية والطعام . هناك علاقة ارتباطية بين البيئة المدرسية والصحة الجسدية (مشاكل الجهاز الهضمي - التنفسي والجلدية) (مربع كاي= 14.150، $p\text{-value} = 0.001$ ، $\alpha = 0.05$). وكذلك علاقة ارتباطية بين البيئة المدرسية والصحة النفسية (القلق، احترام الذات والسلوك العدواني) (مربع كاي= 2.50، $p\text{-value} = 0.114$ ، $\alpha = 0.05$).

الخاتمة: تتصف البيئة العشوائية في المدرسة بالفقر لمصدر مياه الشرب الصحية، والأكل الصحي، والمصادر الآمنة للكهرباء والنار.

التوصيات: توفير التمريض المدرسي ضروري لصحة الأطفال والوحدات الصحية ذات البنية التحتية الجيدة. ضرورة تكثيف البرامج التثقيفية والتوعوية للأمهات والأطفال حول النظافة الذاتي.

CHAPTER ONE
INTRODUCTION

CHAPTER ONE

1.1 Introduction

Slums are poor quality and often insecure, hazardous and overcrowded housing, inadequate provision for infrastructure and services, inadequate protection and poorer rights through the operation of the law, inadequate income and inadequate unstable, (*Sheuya, 2008*).

Children from 6 to 12 years are often referred to as the school child. Students spend most of their time at schools, that school environment is important to encourage and support the teaching and learning process. The environment is one of three elements of public health concern which include the agent and host. So that the good environment contributes to outcome of the health education and service programs, (*Deith B., 2012*).

A healthful school environment is a dynamic concept it involves all the internal and external factors that the individual during the course of the school day, healthful school living through promotion, maintenance and use of safe and whole some surroundings organization of day-to-day experiences, and planned learning procedures that influence favorable emotional, physical and social health of students and school personal, (*Deith B. , 2012*). Slums dwellers constitute 81% of working in the informal sector and 20% of unemployed men and 38% of families whose income is less than 200 pounds per month. Slums are densely populated and high contention rate up to 128.5 thousand and inhabitants per square kilometer, or 5 times the rate for Cairo, 585 of the population competing for shared water courses, (*Swiss, 2008*). The overall environment in the Indian slums smells like human excretions, corpses. The roads in the slums are heavily polluted and the shacks are lined up so tight that the residents have to walk in single-file past the sewers. Real toilets, sinks, and showers are not available to the

slum-dwellers so they do their personal needs any place that is available, (*Flickr, 2010*).

The children in the Indian slum community are being affected by the current living environment. The surrounding environment affects children due to the diverse types of animals also living in the slums. Often times, these animals have diseases that can contaminate the children. In addition, concentration of pesticide and lack of education create danger to children and animals in the community. Floods create muddy surfaces which makes transportation difficult for children that attend school. The education is crucial to young children because it provides the impoverished potential for an alternative lifestyle with better health and success, (*Flickr, 2010*).

In Egypt Slums characterized by urban decay, high rates of poverty, illiteracy, and unemployment, they are commonly seen as breeding grounds for social problems such as crime, drug addiction, alcoholism, high rates of mental illness, and suicide. In many poor countries they exhibit high rates of disease due to unsanitary condition, malnutrition, and lack of basic healthcare, (*Wikipedia, 2008*).

The school nurse has a major role in ensuring safety for school children. They have a variety of opportunities to provide clinical nursing care, including health assessments and supervision of the health activities for them, (*American Academy Of Pediatrics, 2008*).

1.2 Justification:

This study conducted because according to WHO reports approximately one-quarter of the global disease burden, and more than one-third of the burden among children, is due to modifiable environmental factors. The analysis here also goes a step further, and systematically analyzes how different diseases are impacted by environmental risk and by 'how much.' Heading that list are diarrhea, lower respiratory infections, various forms of unintentional injuries,

and malaria. Also because the poverty related to health hazards is increasing in the urban set up. These include infectious and gastro-intestinal diseases, often called 'diseases of poverty' chronic de-generative diseases associated with poor living and working conditions and pathogenic conditions associated with stress resulting from social isolation and insecurity, health facilities are critical, and becoming rare in slum environment. School nurse in Sudan has no effective role.

1.3 Objectives

1.3.1 General Objective:

To study effects of slum environment on child health in Ali Ibn AbiTalp primary school- Khartoum State- Sudan.

1.3.2 Specific Objectives:

- a) To assess the child adherence to self-hygiene measures.
- b) To identify health problems among children related to slums environment.
- c) To find association between health problems and socio-demographic characteristics of children.
- d) To evaluate the school safety environment.

CHAPTER TWO
Literature Review

CHAPTER TWO

2.1 Literature Review

2.1.1 Environment and Health:

Globally, an estimated 24% of the disease burden (healthy life years lost) and an estimated 23% of all deaths (premature mortality) was attributable to environmental factors. Among children 0–14 years of age, the proportion of deaths attributed to the environment was as high as 36%. There were large regional differences in the environmental contribution to various disease conditions – due to differences in environmental exposures and access to health care across the regions. For example, although 25% of all deaths in developing regions were attributable to environmental causes, only 17% of deaths were attributed to such causes in developed regions. Although this represents a significant contribution to the overall disease burden, it is a conservative estimate because there is as yet no evidence for many diseases. Also, in many cases, the causal pathway between environmental hazard and disease outcome is complex. Where possible, attempts were made to capture such indirect health effects. For instance, malnutrition associated with waterborne diseases was quantified, as was disease burden related to aspects of physical inactivity attributable to environmental factors (e.g. urban design) (*WHO, 2004*). But in other cases, disease burden was not quantifiable even though the health impacts are readily apparent. For instance, the disease burden associated with changed, damaged or depleted ecosystems in general was not quantified.

Of the 102 major diseases, disease groupings and injuries covered by the World Health Report in 2004, environmental risk factors contributed to disease burden in 85 categories. The specific fraction of disease attributable

to the environment varied widely across different disease conditions(*WHO, 2004*).

Diseases with the largest absolute burden attributable to modifiable environmental factors included: diarrhoea; lower respiratory infections; 'other' unintentional injuries; and malaria.

- **Diarrhea:** An estimated 94% of the diarrhoeal burden of disease is attributable to environment, and associated with risk factors such as unsafe drinking-water and poor sanitation and hygiene.
- **Lower respiratory infections:** These are associated with indoor air pollution related largely to household solid fuel use and possibly to second-hand tobacco smoke, as well as to outdoor air pollution. In developed countries, an estimated 20% of such infections are attributable to environmental causes, rising to 42% in developing countries.
- **Other unintentional injuries:** These include injuries arising from workplace hazards, radiation and industrial accidents; 44% of such injuries are attributable to environmental factors(*WHO, 2004*).
- **Malaria:** The proportion of malaria attributable to modifiable environmental factors (42%) is associated with policies and practices regarding land use, deforestation, water resource management, settlement siting and modified house design, e.g. improved drainage. For the purposes of this study, the use of insecticide-treated nets was not considered an environmental management measure.

Environmental factors, such as inadequate pedestrian and cycling infrastructures, also make a significant contribution to injuries from road traffic accidents (40%). However, health impacts of certain longer term changes in urban geography and mobility patterns are yet to be measured.

An estimated 42% of chronic obstructive pulmonary disease (COPD), a gradual loss of lung function, is attributable to environmental risk factors such as occupational exposures to dust and chemicals, as well as indoor air pollution from household solid fuel use. Other forms of indoor and outdoor air pollution – ranging from transport to second-hand tobacco smoke – also play a role. A list of the 24 diseases with the largest environmental contribution to overall burden is noted in the following figure. Detailed description of environmental factors and impacts on all diseases considered is provided in subsequent chapters, as are statistical tables and annexes covering global, and regional disease burden, as well as special sub-groups such as children.

2.1.1 Challenge of Slum Health:

In 2002, the UN operationally defined slums as those communities characterized by: insecure residential status, poor structural quality of housing, overcrowding, and inadequate access to safe water, sanitation, and other infrastructure (*UN-HABITAT, 2002*). The 2003 UN report, *The Challenge of Slums*, is the most comprehensive account of the demographic and socioeconomic indicators of slums worldwide (*UN-HABITAT, 2003*). It details not only the high concentration of poverty and substandard living conditions in slums, but also the insecurity of tenure and marginalization from the formal sector, including basic health services.

Developing countries, meanwhile, carry a heavier burden of disease from unintentional injuries and road traffic injuries attributable to environmental factors. In developing countries, the average number of healthy life years lost, per capita, as a result of injuries associated with environmental factors, was roughly double that of developed countries; the gap was even greater at the sub regional level. For road traffic injuries, there was a 15-fold difference

between the environmental burden of disease in the best performing and worstperformingsub regions, and a 10-fold disparity for 'other' unintentional injuries (*WHO, 2016*).

2.1.2 Components of School environment:

A school environment is broadly characterized by its facilities, classrooms, school-based health supports, and disciplinary policies and practices. It sets the stage for the external factors that affect students. A positive school environment is defined as a school having appropriate facilities, well-managed classrooms, available school-based health supports, and a clear, fair disciplinary policy. There are many hallmarks of the academic, disciplinary, and physical environments of schools with a positive climate.

Physical environment refers to the level of upkeep, ambient noise, lighting, indoor air quality and/or thermal comfort of the school's physical building and its location within the community.

The physical environment of the school speaks to the contribution that safe, clean, and comfortable surroundings make to a positive school climate in which students can learn.

(A) Ventilation:

The results of the New Haven and Syracuse studies, which were of a preliminary nature and should not be clothed with greater reliability than the methods warrant, are in agreement to an astonishing degree in confirming the findings of the New York State Commission on Ventilation, that from the angle of the health of the pupils, as indicated by the incidence of respiratory illness, natural ventilation (where local conditions permit its use), is superior. In the Cattaraugus County Study, which was restricted to one and

two room rural schools, the numbers of individuals under the various conditions were so small and the conditions so varied and to that accomplished by mechanical means under average conditions of operation so varied and variable, that there was no apparent relationship between air conditions (as indicated by dry bulb temperatures) and respiratory illness among the pupils. An impression of the air conditions in these rural schools may be gained from analysis of the data collected by the Commission's observers on the occasion of their visits to the schools.

Indoor air quality in schools can impact attendance, comfort, performance, school equipment and most importantly health. Poor air quality can cause headaches, fatigue, shortness of breath, sinus congestion and irritation of the eyes nose and throat. These health impacts can affect the productivity of teachers and students, resulting in them not having the best out of education ([https://www.axair-fans.co.uk/.](https://www.axair-fans.co.uk/))

(B) Lighting:

Researchers at the University of Leuven's Technology Campus in Ghent, passive house platform Pixii and WTCB, the scientific and technical centre for construction, have conducted a study including several pilot projects assessing the impact of daylight systems on the design and renovation of school buildings. The aim was to ascertain just how serious the problem is and to devise methods to improve both the quality of light and its energy consumption (*Emma, 2018*).

Poor lighting in schools is as much a problem, as demonstrated in a recent study by Lighting for People, part of an EU-funded research project to introduce better quality lighting systems throughout the European Union. The study, which focused on education, shows that pupils who benefit from

optimized lighting perform better in class, demonstrate better levels of social behaviour and in general show higher levels of well-being. Ryckaert said that in his study, he found many classrooms with only about 200 lux units of light while the recommended level, according to studies like the one by the EU, is 500 lux. He added that in some classrooms, children could hardly see the blackboard because of a lack of lighting and that such conditions exacerbate learning problems and conditions such as ADHD (*Emma, 2018*).

(C) Clean drinking water:

Water facilities in schools Water fountains and taps are currently the most common drinking facility in schools, and both are frequently sited in the toilet area. A study (*Walters and Cram, 2002*) which measured the hygiene of water fountains in 39 schools found that most were sited in toilets areas and were dirty, badly maintained and highly contaminated. Fountains with low water pressure were among the most highly contaminated (in part caused by contact with saliva, lips and fingers). Opportunities to drink water are often limited to morning break and lunchtime. How much children drink at school depends on the type and number of drinking facilities, their location, how well maintained they are, how attractive the water supply and facilities are to children and when they are allowed access. A recent study found that over half the schools studied forbade children to take drinks to school to consume at break time (*Croghan, 2002*).

(D) Healthy eating:

Healthy eating for children and adolescents is important to grow up healthily and to maintaining a healthy weight to prevent childhood obesity and chronic diseases such as diabetes. Other terms used are ‘food’ or ‘nutrition’. Healthy eating is often combined with physical activity.

Healthy eating is influenced by the physical and social environments of children and adolescents. The school environment is a key setting to address healthy eating, because students spend a large part of their day in school. Also, healthy eating in combination with physical activity promotes learning .

- Important strategies for healthy eating in schools include (*SHE, 2018*):
 - Nutrition education in schools
 - School feeding
 - School gardens
 - School-based micronutrient supplementation

What makes a programme on healthy eating in school effective?

Healthy eating initiatives in schools should have the following features:

- a whole school approach;
- links with parents and food preparation at home;
- consistency between the taught curriculum and food availability in the school;
- programme longevity (over three years) and regular inputs by staff and students in planning and implementing activities;
- On-going capacity building opportunities for staff. (*SHE, 2018*)

2.1.3 Physical Health:

Traditional definitions of physical health prior to the onset of modern medicine would have considered someone physically healthy if he or she was not stricken with a serious illness. With modern medical innovations came longer life spans, which changed the way we define physical health. Today's definition can consider everything ranging from the absence of disease to fitness level.

While physical health consists of many components, here is a brief list of the key areas that should be addressed:

- Physical activity - includes strength, flexibility, and endurance
- Nutrition and diet- includes nutrient intake, fluid intake, and healthy digestion
- Alcohol and drugs- includes the abstinence from or reduced consumption of these substances
- Medical self-care - includes addressing minor ailments or injuries and seeking emergency care as necessary
- Rest and sleep - includes periodic rest and relaxation, along with high quality sleep.

2.1.3.1 Components of Physical Health

Below are ways that each key area of physical health can be addressed through lifestyle choices:

Physical activity: Most healthy children and adults should be active on a daily basis. This should be a mix of both leisurely physical activity and structured exercise. Examples of leisurely physical activity include hiking, biking, and walking. Examples of more structured forms of exercise include strength training, running, and sports.

Nutrition and diet: A well-balanced diet should contain carbohydrates, proteins, fats, vitamins, and minerals. Restricting specific nutrients should only be done under the supervision of a licensed health professional. Fluid, ideally in the form of clean water, should be regularly consumed. Meals and snacks should be consumed throughout the day, and portion sizes should be sensible.

Alcohol and drugs: Substances that alter mood or other bodily processes should be limited or avoided. Those with addictive tendencies or other health risks should consider complete abstinence from these substances.

Medical self-care: Basic items, such as bandages, lozenges, and over-the-counter pain-relieving medications, should be easily accessible from home. Long-term coughing, fevers, or other ailments should be addressed through primary care. Emergency treatment should be sought when signs and symptoms are significant or life-threatening.

Rest and sleep: While regular activity is essential for physical health, allowing the body to rest is just as important. Spending time relaxing or taking short naps can help rejuvenate the body. Sleep should take place in a quiet, dark environment and should last approximately 7-9 hours. Consistent sleep that is much shorter or longer than this duration, or is low quality, may need to be addressed by a health professional(*Sudy.com, 2018*).

2.1.4 Psychological Health:

Childhood and adolescence is an important time for social and emotional development. At the same time, having good mental and physical health supports young people in managing the challenges they encounter during their development (*SHE, 2018*).

Mental health should be a feature of all school health promotion initiatives. Not only the foundation of life-long mental health is established in the early years, a whole school approach will also lead to a higher school connectedness, a better school climate and school improvement.

Schools can play an important role in the mental health and well-being of their students and staff. Obtaining the skills needed for academic success can contribute to a better life quality in students.(*SHE, 2018*). A positive school

environment can promote good mental health in students and staff; in turn, good mental health of students and staff can promote academic performance in students and reduce staff absenteeism. Bullying and feelings of not being accepted by peers and teachers contributes to poor mental health in students (*SHE, 2018*).

Important strategies for promoting mental health in schools include:

- social and emotional learning
- include family, community and services
- integrate and plan mental health promotion that complement each other and are included in overall strategic planning

2.2 Previous Studies:

A cross sectional study of representative samples of 35 schools of selected regions of Nepal, including government and private schools, was conducted. Onsite observations and health checkups, along with interview with pupils and teachers, were carried out. Specific scores were given for all criteria. The data were analyzed and edited using the Epi Info program. Concluded that the main causes are poor socio-economic status, illiteracy of parents, negligence, physically demanding housework for children, disease, malnutrition, incomplete immunization and lack of health education.

The poor environmental conditions at school include crowded classrooms, poor ventilation, shortage of clean drinking water, unhygienic or untidy clothing worn by pupils, poor nutrition, lack of greenery in the school area, location of schools close to main roads, air pollution and lack of environmental awareness among teachers and parents. The government schools have limited budgets and resources when compared to private

schools. Most of the lower and lower middle class family children are studying in government schools; these schools are attended by 82% of the total number of pupils, nationally (*Joshi, S D; Pandit, N; Kuma, S, 2005*).

It has been pointed out that typical school buildings and classroom layouts vary between countries in ways that are related to understandings and philosophies of education as well as to material resources (*Alexander, 2000*). From a study of 30 primary schools in five countries, Alexander reports some interesting consistencies such as the much more elaborate displays of children's finished work in the American and British schools (*op.cit.,p.184*); the arrangement of the children in rows of individuals in India, rows of pairs in Russia and around work 'centres' in the USA (p.333-334); and the contrast of 'a great deal of light' in all the Russian classrooms with some British and American classrooms 'so inadequately fenestrated that they required artificial light throughout the day'. (p.185).

Reducing the disease burden of environmental risk factors will contribute significantly to the Millennium Development Goals.

GOAL (1): Minimizing exposures to environmental risk factors indirectly contributes to poverty reduction, because many environmentally mediated diseases result in lost earnings. Also, disability or death of one productive household member can affect an entire household. With respect to hunger, healthy life years lost to childhood malnutrition is 12-times higher per capita in developing regions, compared with developed regions. There was a 60-fold difference in WHO sub regions with the highest and lowest malnutrition rates.

GOAL (2): Providing safe drinking-water and latrines at school (particularly latrines for girls) will encourage primary school attendance. Interventions that

provide households with access to improved sources of drinking-water and cleaner household energy sources also improve student attendance, saving time that children would otherwise spend collecting water and/or fuel. The same interventions can save children from missing school as a result of illness or injury(*UN, 2017*).

CHAPTER THREE

Methodology

CHAPTER THREE

3.1 Study Design:

This is a descriptive cross-sectional community-based study.

3.2 Study Area:

This study conducted at Ali Abn Abe Talp primary school in Khartoum locality –State of Khartoum- Sudan.

3.3 Study population:

All pupils learning at Ali Abn Abe Talp primary school. It is governmental school located in Emtedad (Sahafa Zalat) near Samir health center state of Khartoum. The school consists of eight classes.

3.3.1 Inclusion Criteria:

- Pupils of age < 14 yrs.
- Learning in 5th and 6th level.

3.3.2 Exclusion Criteria:

- Pupils whose age >14 yrs.
- Wholearning in other levels.
- Who refused to participate in the study.

3.4 Sampling Technique:

Full coverage method used to select the study sample from the two classes (fifth and sixth classes).

3.5 Sample Size:

The study sample consisted of (40) pupils; (20) pupils from class five and (20) from class six selected intentional.

3.6 Method of Data Collection:

The data collected from the study sample by using:

1- A questionnaire: designed by the researcher and reviewed by experts. It consisted of two parts;

Part one: dealt with socio-demographic data of participants.

Part two: included questions related to physical and psychological health of children.

2- Check list: consisted of four parts;

Part one: general appearance.

Part two: child behavior.

Part three: slums environmental factors.

Part four: child growth measurements.

3.7 Study Variables:

Socio-demographic variables (age, school grade, order in family, marital status of parents, family income)

Study variables (self hygiene practices, general appearance, behavior, ventilation, lighting, source of drinking water, source of eating, source of electricity, site of school)

3.8 Method of Data analysis:

The collected data analyzed by using the computer software (SPSS), version (16) Statistical package for social sciences.

3.9 Ethical Considerations:

- 1- The permission to conduct the study was obtained from the State ministry of health, and from the school administration.
- 2- The children in each setting were informed about the purpose and objectives of the study. Issues of confidentiality of person and information; voluntariness in participation; withdrawal from the study at any point if they wish were stressed. After ascertaining that participants had clear understanding of the study, consent was obtained.

CHAPTER FOUR

Results

CHAPTER FOUR

Results

Table.(1): Distribution of children according to Age

| Age | Number | Percentage |
|--------------|---------------|-------------------|
| (9-11) yrs. | 15 | 37.5% |
| (12-14) yrs. | 25 | 62.5% |
| Total | 40 | 100% |

Table (1), Showed that more than a half of studied children (62.5%) of age range (12-14) years. The mean age was 11.87 ± 0.843 . Concerning children learning level (50%) were in the fifth and (50%) were in the sixth level.

Table.(2): Distribution of children according to type of family

| Marital status of parents: | Number | Percentage |
|-----------------------------------|---------------|-------------------|
| Live together | 29 | 72.5% |
| Separated | 11 | 27.5% |
| Total | 40 | 100% |

Distribution of children with regard to type of family showed that (72.5%) of the children parents live together.

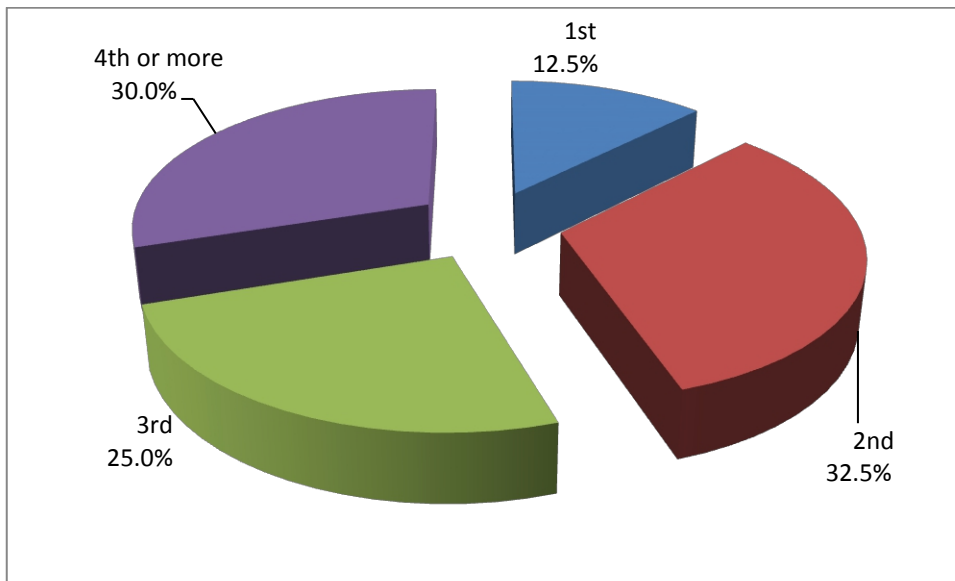


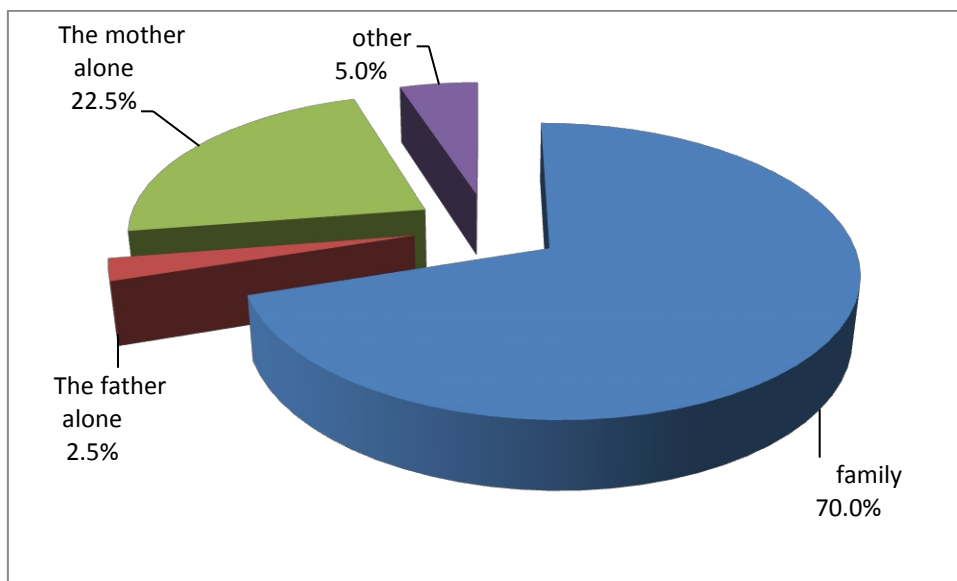
Fig.(i): Distribution of children according to order

Regarding children order among their brothers and sisters, fig.(i) illustrated that about one third (32.5%) were second in order.

Table (3): Distribution of children according to family income

| Family income: | Number | Percentage |
|----------------|-----------|-------------|
| Low | 36 | 90% |
| Moderate | 4 | 10% |
| Total | 40 | 100% |

From table (3) the most of the studied children (90%) their family had low income.



Fig(ii): Distribution of children according to children live with

Fig.(ii) showed that more than two thirds of children (70%) lived with their families.

Table (4): Distribution of children according to methods of hand washing.

| Method | Number | Percentage |
|-----------------|-----------|-------------|
| with water only | 34 | 85% |
| Water and soap | 6 | 15% |
| Do not wash | 0 | 0% |
| Total | 40 | 100% |

Table (4) illustrated that the majority of the studied children (85%) wash their hands with water only.

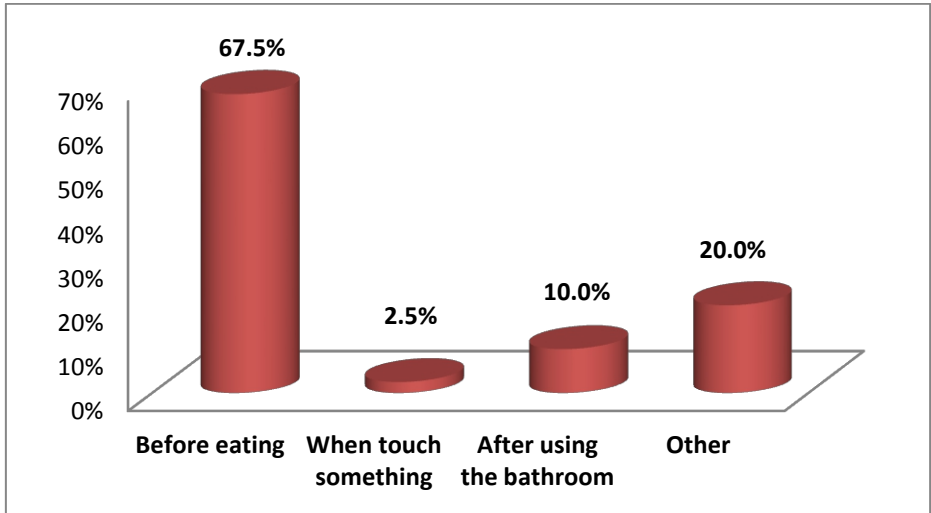


Fig.(iii): Distribution of children according to Time of washing hands.

Fig.(iii) described that about two thirds of children (67.5%) wash their hands before eating.

Table (5): Distribution of children according to frequency of bathing.

| Frequency | Number | Percentage |
|--------------|-----------|-------------|
| Once | 31 | 77.5% |
| Twice | 9 | 22.5% |
| Three times | 0 | 0% |
| Total | 40 | 100% |

From table (5) more than two thirds of studied children had once shower per week.

Table (6): Distribution of children according to accessible health Service.

| Frequency | Number | Percentage |
|--------------------|---------------|-------------------|
| School nurse | 0 | 0% |
| External physician | 0 | 0% |
| Health unit | 40 | 100% |
| Total | 40 | 100% |

Table (6) showed that all the studied children said they go to the health unit when feel sick.

Table (7): Distribution of children according to place of vaccination

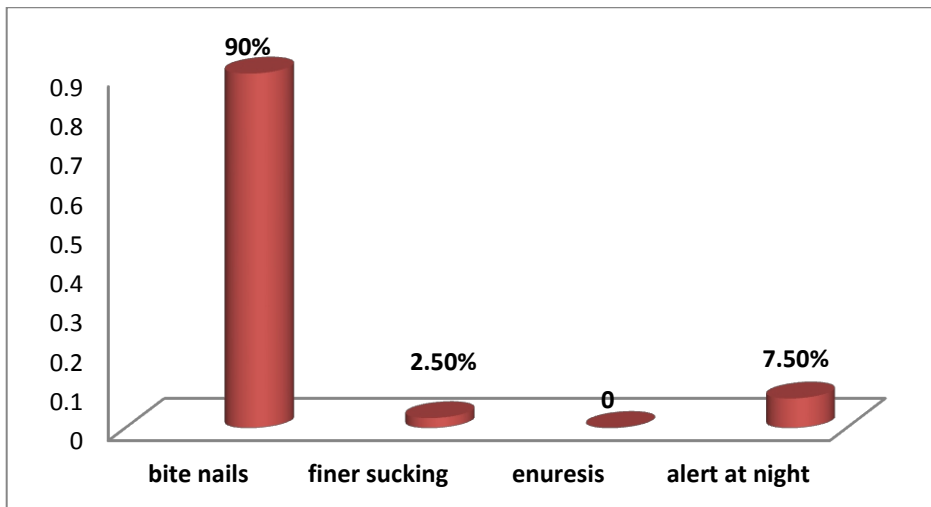
| Place of vaccination | Number | Percentage |
|-----------------------------|---------------|-------------------|
| School | 0 | 0% |
| Health unit | 40 | 100% |
| Total | 40 | 100% |

Also, it is clear that all studied children get vaccination at the health unit, as described in table (7).

Table (8): Distribution of children according to smoking

| Smoking type | Number | Percentage |
|--------------|-----------|-------------|
| Cigarette | 2 | 5% |
| Shisha | 0 | 0% |
| Banjo | 0 | 0% |
| nothing | 38 | 95% |
| Total | 40 | 100% |

The children responses showed that most of them (95%) did not have any type of smoking.



Fig(iv): Distribution of children according to unhealthy habits

Fig.(iv)illustrated children unhealthy habits, results revealed most of children (90%) bite nails.

Table (9): Distribution of children according to health problems related to digestive system (n=40)

| Digestive health problems | Number | Percentage |
|---------------------------|--------|------------|
| Food poisoning | 25 | 62.5% |
| Diarrhea | 3 | 7.5% |
| Gastritis | 3 | 7.5% |
| constipation | 2 | 5% |

The above table illustrated that food poisoning was the most common digestive health problem affected (62.5%) of the studied children, followed by diarrhea and gastritis, each affected (7.5%) of the study sample, and then constipation affected (5%).

Table(10): Distribution of children according to health problems related to respiratory system (n=40)

| Respiratory health problems | YES | | NO | |
|-----------------------------|--------|------------|--------|------------|
| | Number | Percentage | Number | Percentage |
| Asthma | 2 | 5% | 38 | 95% |
| Pneumonia | 1 | 2.5% | 39 | 97.5% |
| Bronchitis | 0 | 0% | 100 | 100% |
| influenza | 35 | 87.5% | 5 | 12.5% |

Table (10) described that influenza was the most common health problem of respiratory system attacked (87.5%) of the studied children, then Asthma (5%), and pneumonia (2.5%).

Table (11): Distribution of children according to health problems related to dermatology (n=40)

| derma problems | YES | | NO | |
|----------------|--------|------------|--------|------------|
| | Number | Percentage | Number | Percentage |
| Eczema | 2 | 5% | 38 | 5% |
| Itching | 5 | 12.55 | 35 | 87.5% |

From table (11) illustrated there were (12.5%) of the studied sample had itching and (5%) had Eczema.

Table (12): Distribution of children according to health problems related to general appearance. (n=40)

| Problems | Yes | | No | |
|---------------|--------|------------|--------|------------|
| | Number | Percentage | Number | Percentage |
| Eye: | | | | |
| hyphema | 0 | 0 | 40 | 100% |
| Corneal wound | 23 | 57.5% | 17 | 42.5% |
| Face: | | | | |
| wounds | 25 | 62.5% | 15 | 37.5% |

Concerning health problems related to general appearance, there were (57.5%) of children had corneal wound in their eyes, and (62.5%) had wounds in their faces. There was no health problems related to mouth, head, nose, arms and legs as displayed in table (12).

Checklist Analysis

Table(13): Distribution of children according to general appearance measures (n=40)

| | clean | | unclean | |
|----------------------|--------|------------|---------|------------|
| | number | percentage | number | percentage |
| Hair | 25 | 62.5% | 15 | 37.5% |
| Eye | 37 | 92.5% | 3 | 7.5% |
| Nose | 24 | 60% | 16 | 40% |
| Oral and dental | 24 | 60% | 16 | 40% |
| Hands and feet nails | 16 | 40% | 24 | 60% |

Table (13) check list analysis for general appearance showed that the majorities had clean hair (62.5%), clean eyes (92.5%), clean nose (60%), clean oral and dental (60%). But (60%) had unclean hand and feet nails.

Table (14):Distribution of children according to Behavior measures (n=40)

| Problem | Low | | Moderate | | Severe | |
|---------------------|--------|------------|----------|------------|--------|------------|
| | Number | Percentage | Number | Percentage | Number | Percentage |
| Anxiety | 27 | 67.5% | 12 | 30% | 1 | 2.5% |
| Self esteem | 25 | 62.5% | 15 | 37.5% | 0 | 0% |
| Aggressive behavior | 24 | 60% | 11 | 27.5% | 5 | 12.5% |

Table (14) illustrated check list analysis for behavior measures showed that the majority (67.5%) had low level of anxiety,(30%) had moderate level and only (2.5%) had severe anxiety.

With regard to self-esteem (62.5%) had low level and (37.5%) had moderate level?Regarding aggressive behavior, (60%) were low aggressive, (27.5%) moderately aggressive and (12.5%) severely aggressive.

Table (15): Slums environmental factors (n=40)

| Factors | Good | | Poor | |
|---------------------------|--------|------------|--------|------------|
| | number | percentage | number | percentage |
| Ventilation | 40 | 100% | 0 | 0% |
| Lighting | 40 | 100% | 0 | 0% |
| Source of drinking water. | 0 | 0% | 40 | 100% |
| Source of eating | 0 | 0% | 40 | 100% |
| Sewage sanitation | 40 | 100% | 0 | 0% |
| Collecting garbage | 40 | 100% | 0 | 0% |

Table (15) displayed that the slums environment of the studied children had good ventilation, lighting, sewage sanitation and collecting garbage. But it had poor source of drinking water and poor source of eating, that can negatively affects the children health status.

Table (16): slums environment safety (n=40)

| Factors | Safe | | Unsafe | |
|---------------------------------|--------|------------|--------|------------|
| | number | percentage | number | percentage |
| Securing source of electricity. | 0 | 0% | 40 | 100% |
| Securing source of fire. | 0 | 0% | 40 | 100% |
| Securing windows. | 40 | 100% | 0 | 0% |
| Site of school | 40 | 100% | 0 | 100% |

Table (16) illustrated that the children environment had unsafe source of electricity and unsafe source of fire. But the environment had safe secured windows and safe school site.

Table (17):Distribution of children according to growth measurements (n=40)

| Measurements | Normal | | Abnormal | |
|--------------|--------|------------|----------|------------|
| | Number | Percentage | Number | Percentage |
| Height | 37 | 92.5% | 3 | 7.5% |
| Weight | 34 | 85% | 6 | 15% |

Table (17) illustrated that most of studied children had normal height measurement (92.5%) and normal weight measurement (85%). This reflects that the majority of studied students with normal growth measurements.

Association tests:

Table (18): association between school environment and the children physical status:

| Environment factors | digestive problems | respiratory problems | derma problems |
|---------------------|---------------------|----------------------|---------------------|
| Chi-Square | 16.900 ^a | 28.900 ^a | 16.900 ^a |
| df | 1 | 1 | 1 |
| p-value. | 0.000 | 0.000 | 0.000 |

From table (18) , association is statistically significant between school environment and health problems related to digestive system ($\chi^2 =16.9$, p-value = 0.000 , $\alpha = 0.05$). Also a association is statistically significant between school environment and health problems related to respiratory

system ($\chi^2 = 28.9$, p-value = 0.000 , $\alpha = 0.05$). and also a association is statistically significant between school environment and health problems related to dermatology system ($\chi^2 = 16.9$, p-value = 0.000 , $\alpha = 0.05$).

These results indicate there is association between school environment and the children physical status.

Table (19): Association between school environment and the children behavior:

| Environment factors | Anxiety | Self-esteem | Aggressive behavior |
|----------------------------|---------------------|--------------------|----------------------------|
| Chi-Square | 25.550 ^a | 2.500 ^b | 14.150 ^a |
| Df. | 2 | 1 | 2 |
| p-value. | 0.000 | 0.114 | 0.001 |

From table (19), association is statistically significant between school environment and anxiety ($\chi^2 = 25.55$, p-value = 0.000, $\alpha = 0.05$). Also association is statistically significant between school environment and aggressive behavior ($\chi^2 = 14.150$, p-value = 0.001 , $\alpha = 0.05$). the association is not statistically significant between school environment and self-esteem ($\chi^2 = 2.50$, p-value = 0.114 , $\alpha = 0.05$).

These results indicate there is association between school environment and the children physical status.

CHAPTER FIVE

Discussion, Conclusion & Recommendation

CHAPTER FIVE

Discussion, Conclusion & Recommendation

5.1 Discussion:

In an attempt to enable a better accounting and monitoring of slums, the UN in 2003 formulated one of the first operational definitions for slums. Specifically, a slum was defined as a group of households lacking one or more of the following: (1) durable housing of a permanent nature that protects against extreme climate conditions; (2) inadequate living space; (3) easy access to safe water in sufficient amounts at an affordable price; (4) adequate access to sanitation in the form of a private or public toilet shared by a reasonable number of people; and (5) security of tenure that prevents against forced evictions (*UN-Habitat, 2003*).

This study aimed to study effects of slum environment on child health in Ali Ibn Abe Talp primary school- Khartoum State- Sudan. The study included (40) children. (20) learning in fifth level and (20) in sixth level classes, more than a half of studied children (62.5%) of age range (12-14) years with mean age was 11.87 ± 0.843 . (72.5%) of the children parents live together, about one third (32.5%) were second in order among their brothers and sisters. Findings also showed most of the studied children (90%) their family had low income, And more than two thirds of children (70%) lived with their families.

Hand washing can help prevent illness. It involves five simple and effective steps (Wet, Lather, Scrub, Rinse, Dry) to reduce the spread of diarrheal and respiratory illness to stay healthy. Regular hand washing, particularly before and after certain activities, is one of the best ways to remove germs, avoid getting sick, and prevent the spread of germs to others. It's quick, it's simple,

and it can keep us all from getting sick. Hand washing is a win for everyone, except the germs (*Centers for Disease Control and Prevention, 2018*). In this study findings reported that the majority of the studied children (85%) wash their hands with water only. And about two thirds of children (67.5%) wash their hands before eating. Also Studies of personal and domestic hygiene and its relationship to diarrhea in developing countries demonstrate the effectiveness of proper waste disposal, general sanitary conditions, and hand washing (*Ekanem, 1991*). Also the study found that more than two thirds of studied children had once shower per week. This reflects low level of hygiene practice that increases liability of being sick.

The study findings also revealed that all the studied children go to the health unit when feel sick, and all took their vaccination in the health unit. This reflects the important role the health units played and shows complete absence of school nursing role.

Regarding smoking the study results showed low level smokers among the studied children, (95%) were non-smokers. Unhealthy habits usually related to psychological symptoms and signs, the results found there were (90%) of children use to bite nails, a few of them (2.5%) suck fingers, and there (7.5%) alert at night.

World Health Organization reported that Diseases with the largest absolute burden attributable to modifiable environmental factors included: diarrhoea; lower respiratory infections; 'other' unintentional injuries; and malaria.

Unclean eating is the main cause of food poisoning. The results showed there (62.5%) of children experience food poisoning. This high percentage reflects unsafe source of eating in children environment. Also there were low level of Diarrhea (7.5%), and Gastritis (7.5%). Also WHO reported that lower

respiratory infections are associated with indoor air pollution related largely to household solid fuel use and possibly to second-hand tobacco smoke, as well as to outdoor air pollution. In developed countries, an estimated 20% of such infections are attributable to environmental causes, rising to 42% in developing countries. In this study influenza was the most common among the children (87.5%).

Joshi, et al.(2005) reported the poor environmental conditions at school include crowded classrooms, poor ventilation, shortage of clean drinking water, unhygienic or untidy clothing worn by pupils, poor nutrition, lack of greenery in the school area, location of schools close to main roads, air pollution and lack of environmental awareness among teachers and parents. The government schools have limited budgets and resources when compared to private schools.

This recent study found that children environment had good ventilation, lighting, sewage sanitation and collecting garbage. But it had poor source of drinking water and poor source of eating, that can negatively affects the children health status. The study results showed that the children environment has unsafe source of electricity and fire which endanger children life. The study showed that the most of children had normal growth measurements.

The results revealed there significant association between school environment and physical health (digestive- respiratory problems and dermatology status. and also a significant association between school environment and psychological health (Anxiety, Self-esteem and Aggressive behavior).

5.2 Conclusion:

This research came out with the following findings:

- The studied school had bad source of drinking water.
- There was no safety source of eating.
- No proper and safe electricity and fire sources.
- The children faced some physical as food poisoning, influenza, skin etching, and low level of psychological health problems such as anxiety, Self-esteem and Aggressive behavior.

5.3 Recommendations:

- 1- Encouraging schools to promote water.
- 2- Educate or conduct awareness program to both mothers and children about self-hygiene measure.
- 3- Ministry of education has to improve school environment to be safety.
- 4- Ministry of health necessary to provide school nursing and health units of well- infrastructure.
- 5- School management should provide safe food source for the children.

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Appendixes