

Assessing the Nursing Performance Related To Prevention of Communicable Disease Among Children Under Five Years

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Abstract

Background: Children under five years aren't only constitute a large group but also they are vulnerable or high risk group for communicable diseases. Pneumonia and diarrhea are the leading causes of death among them around the world. **Aim:** This study aimed to assess the nursing performance related to prevention of communicable disease among children under five years. **Research design:** Descriptive research design was used in the study. **Setting:** The study was conducted at the maternal and child health care centers and primary health care units in Banha and Toukh health directorate at Qalyubia governorate. **Sample:** Multistage random sampling technique was used (116 nurses). **Tools of data collection:** Two tools was used in the study. **First Tool:** Self-administered questionnaire to assess socio-demographic characteristics and knowledge of nurses and the factors affecting community health nurses' performance. **Second Tool:** 6 observational checklists about vaccination, hand washing, intradermal, intramuscular, subcutaneous, health education procedure. **Results:** There were more than three quarters of nurses were graduated of technical secondary school, more than half of them had unsatisfactory knowledge, and the majority of them had inadequate level of performance, There was significant statistical relation between total knowledge of nurses and their educational level, There was a highly significant relation between total nurses' knowledge and their total performance, all of nurses mentioned that the factors affecting nursing performance were lack of an equipped room to conduct health education sessions for mothers and lack of infection control supplies. While most of them said that, there is no support and motivation for nurses to encourage them to work. **Conclusion:** Presence of a strong negative statistically significant correlation between the total scores of nurse's performance and factors affecting their performance related to lack of mother's response to health education about modifying bad health habits. **Recommendation:** Continuous supervision and evaluation for nurses concerned with child health care is required to determine the defect related to their knowledge or practice.

Key words: Nursing Performance - Communicable Disease - Children Under Five Years

Introduction:

Under five children, not only constitute a large group but they are also vulnerable or high risk group. The risk is connected with growth, development and survival. First five years are full of health hazards. Since they are high risk group, under five children are exposed to many environmental factors leading to diseases in children. Pneumonia and diarrhea are the leading causes of death among children under 5

years of age around the world (Black et al; 2015).

The first five years of a child's life is a golden period for their development, fostering their future learning skills and social and emotional abilities due to rapid gains in physical and cognitive growth and development (Gertler et al; 2014).

All countries performed well for prevention of infectious diseases caus-

ing child mortality. However, the progress in cause-specific under-5 mortality rate (U5MR) varied from country to country in 2015. Progress for pneumonia related deaths was not appreciable as compared to that of diarrhea or other causes (Cha et al; 2016).

In Sub-Saharan Africa 1 out of 12 children dies before their 5th birthday, in South Asia 1 out of 19 and in high income countries 1 out of 147. In 2015, 6 million child deaths occurred out of which 30% happened in South Asian countries. From every 10 child deaths worldwide, three happen in South Asia (UNICEF, 2015). Communicable diseases (CD) such as, pneumonia, diarrheal diseases and malaria are major causes of childhood morbidity and mortality world-wide which have account for 41% of annual death globally and 49% out of them in Africa (World Health Organization WHO, 2012). The State of the World's Children 2012 report showed that globally, 7.6 million children under 5 years of age die annually and 3.7 million deaths out of them occur in Sub-Saharan Africa (United Nations International Children's Emergency Fund UNICEF, 2015). Several studies in Africa reported communicable diseases (CD) as the leading causes of childhood death (Olumide et al., 2012). The bulk of childhood morbidity and mortality affect mainly children under 5 years of age, these diseases can be prevented, and the treatment is accessible and affordable, (WHO, 2013).

A communicable disease (CD) is a clinically manifest disease of humans or animals due to a specific infectious agent or its toxic products, that arises through transmission of that agent or its products from an infected person, animal or inanimate source to a susceptible host; either directly or indirectly

through an intermediate plant or animal host, vector or the inanimate environment (Helferty et al; 2013).

Traditionally, community health nurses (CHN) were viewed as the individuals who detected disease in the community, and the people who applied bandages and cared for ill or injured child. Although these functions remain important parts of the public nurse's job, the role of the nurse has expanded considerably in recent years. Today's, public health nurse (PHN) manages and coordinates all the care required by healthy children and children with special health care needs. In many settings, community health services have enlarged into family health centers that meet the needs of not only children, but also their families and the community (Black, 2016).

The community, family, and individual have a right to essential health care, Essential health care is accessible, affordable, comprehensive, coordinated, participatory, and culturally appropriate and Nurses in the community have a unique role in contributing to the health of the population. They fulfill this role by working toward the goal of health for all and by providing access to services (Christopher et al; 2011).

Significance of the study:

The United Nations (Interagency estimate for Egypt's under 5 mortality rate (U5MR) was 29,2 /1000 live births in 2012 (Helmy, 2011 and WHO, 2015).

Egypt's under five mortality (U5M) rate was 23/1000 live births in 2018 (Akseer et al; 2018).

The Global Strategy for Women's, Children's and Adolescents'

Health (2016-2030) was launched in September 2015 to reduce under-5 mortality to at least as low as 25 per 1000 live births, respectively; ending major global epidemics (HIV, tuberculosis and malaria); meeting needs such as Essential Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) services coverage, adequate nutrition, clean water and environments; and achieving far-reaching targets such as ending extreme poverty (**Economic & Council, 2016**).

Since 2000, the Egyptian Ministry of Health and Population (MOHP) has reported coverage for all childhood immunizations to be >95% .Due to the success of the immunization program, Egypt has successfully eliminated 2 vaccine - preventable diseases, polio-myelitis since 2005 and neonatal tetanus since 2007 (**WHO, 2011 and UNICEF, 2011**).

The MOHP expanded program on immunization successfully introduced new vaccines for hepatitis B and switched from trivalent oral poliovirus vaccine to bivalent oral poliovirus vaccine at the national level. Coverage for new vaccines since the introduction of pentavalent to routine immunization reached 97 per cent in 2017, up from 0 per cent coverage in 2013 and exceeding the target of 90 percent (**Hanson et al; 2018**).

Aim:

The aim of this study to assess the nursing performance related to prevention of communicable disease among children **under five years:**

1. Assessing knowledge of community health nurses regarding prevention of communicable disease for children under five years.

2. Assessing performance of community health nurses regarding prevention of communicable disease for children under five years.

3. Assessing factors affecting community health nurses in prevention of communicable disease for children under five years.

Research questions:

1. Are there relations between knowledge of community health nurses regarding prevention of communicable disease for children under five years and their socio-demographic characteristics?

2. Are there relations between performance of community health nurses regarding prevention of communicable disease for children under five years and their socio-demographic characteristics?

3. What are the relations between knowledge of community health nurses regarding prevention of communicable disease for children under five years and their performance?

4. What are the factors affecting knowledge and performance of community health nurses regarding prevention of communicable disease for children under five years?

Subject and methods

Technical design:

This comprises a description of the study design, setting, subjects, and data collection tools.

Research design:

Descriptive research design was used in the conduction of the study.

Study setting:

The study was conducted at the Maternal and Child Health care centers (MCH) and Primary Health Care units (PHC) in Qalyubia governorate .

Qalyubia governorate has 191 health sectors divided into (111) accredited (PHC) units, (26) unaccredited (PHC) units, (26) accredited medical centers, (14) unaccredited medical centers, (11) health offices and (3) MCH centers, according to the instructions of ministry of health the number of nurses supposed in (PHC) unit is 8 nurses and 15 nurses for (MCH) center and medical center . The health care centers provide maternal and child care, emergency, compulsory vaccinations for children, family planning, dental services and some of these centers give Integrated Management Child Illness (IMCI) for children under five years.

Sampling:

Multistage random sampling technique (type of cluster sampling) was used in collecting the sample of the study.

1st stage: Qalyubia governorate consists of 11 health directorate mentioned as (Kanater, Benha, Qalub, Qaha, El Obour, Kafr Shokr, Sheben El Qanater, Toukh, Shoubra Sharq, Shoubra Qarb and El Khanka health department), 2 health affairs was selected randomly which named as (Benha, Toukh health directorate).

2nd stage: Benha health directorate consists of (24) accredited PHC units, (5) unaccredited PHC units, (3) unaccredited medical centers, (4) health offices and (2) MCH centers, Toukh health directorate consists of (23) accredited PHC units, (3) unaccredited PHC units, (1) accredited medical centers. 50 % of the health sectors in the

previous mentioned 2 health directorates were selected as 19 health sectors (1 MCH center and 18 PHC units) in Benha health directorate and 13 health sectors (1 medical center and 12 PHC units) in Toukh health directorate .

3th stage: we selected randomly 10 % of all nurses working in the health sectors previously mentioned which consisted of 62 nurses who working in Banha health directorate and 54 nurses who working in Toukh health directorate.

The sample size was calculated to observe the nursing performance related to prevention of communicable disease among children under five years in primary health care units in Qalyubia governorate to be 62 nurses in Banha health directorate and 54 nurses in Toukh health directorate, the total sample size was composed of 116 nurses form the previously mentioned directorate.

Nurses were recruited in the study sample upon fulfilling the following eligibility criteria. The all nurses in health sectors mentioned previously in Qalyubia governorate will constitute the sampling. All the eligible nurses in the sampling will be included in the study sample.

Tools of data collection:

it was developed by the investigator based on reviewing related literature, magazines and experts' opinions to assess nursing performance related to communicable diseases prevention among children under five years, the data were collected using two following tools.

First tool:

Self-administered questionnaire (Appendix 4) was developed by the investigator in Arabic language which consists of three parts:

Part I: Questions to assess socio-demographic characteristics of the study sample of nurses concerned with prevention of communicable diseases, it included close ended questions (Q1-Q7) such as age, gender, marital status, qualification, experience, income and training.

Part II: This part represents knowledge of community health nurses regarding prevention of communicable disease for children under five years which divided to 3 sections.

1st section represents knowledge of nurses regarding the communicable diseases, it include 10 multi choice question (Q1- Q11 except Q3) and 3 open questions (Q3 - Q12 - Q 13) covered Definition of communicable diseases, classification of communicable diseases, The relationship between communicable diseases and mortality rate among children under five, Direct and indirect methods of transmission of infectious diseases, Infectious pathogens (causative agent), Signs and symptoms of communicable diseases, Diagnostic measures and The most common communicable diseases among children etc.

Scoring system of total knowledge about communicable diseases :

For each of the knowledge items about communicable diseases, Complete and correct knowledge was scored 2, incomplete knowledge was scored 1 and incorrect one was scored 0, these scores were summed up and converted

into percent scores for each area of knowledge.

The total score for all items related to knowledge about communicable diseases was 26 points and categorized into 3 levels as followings > 85% (23:26 marks) was considered good, 60% : <85% (16:22 marks) is considered average and > 60% (0:15 marks) is considered poor.

2nd section represents their role toward prevention of communicable diseases among children under five, it include 10 multi choice question (Q 14 – Q 23) covered The basic information about infectious diseases community health nurses should be familiar with, Role of community nurse toward the health promotion of under five children, role of community nurse toward the specific protection to prevent communicable diseases, materials used to give health education and role of community nurse toward early detection communicable diseases among children

Scoring system of total knowledge about role toward prevention of communicable diseases among children under five :

For each of the knowledge items, complete and correct knowledge was scored 2, incomplete knowledge was scored 1 and incorrect one was scored 0, these scores were summed up and converted into percent scores for each area of knowledge.

The total score for all items related to the role of community health nurses about communicable diseases prevention among children under five years was 20 points and categorized into 3 levels as followings > 85% (18:20 marks) was considered good, 60% : <85% (12:17 marks) is consid-

ered average and $> 60\%$ (0:11 marks) is considered poor .

3rd section represents their knowledge regarding the immunity and the obligatory immunization among children under than five , it includes 12 multi choice questions (Q25 – Q37 except Q27) and 2 open questions (Q24 , Q27) covered The difference between natural immunity and acquired immunity, methods of acquiring immunity against infectious diseases, the obligatory immunizations given to children, definition and types of vaccine Immunization program, the appropriate temperature for keeping the vaccines in the refrigerator in health units, the role of the immunization program in communicable diseases prevention , simple side effects of the vaccines and complicated side effects

Scoring system of total knowledge about Immunity and obligatory Immunization for children under five years :

For each of the knowledge items about immunity and obligatory immunization for children under five years, complete and correct knowledge was scored 2, incomplete knowledge was scored 1 and incorrect one was scored 0, these scores were summed up and converted into percent scores for each area of knowledge.

The total score for all items related to the role of community health nurses about communicable diseases prevention among children under five years was 28 points and categorized into 3 levels as followings $> 85\%$ (24:28 marks) was considered good , $60\% : <85\%$ (17: 23 marks) is considered average and $> 60\%$ (0:16 marks) is considered poor .

Total knowledge scoring system about communicable diseases prevention for child under five years old was 74 points and categorized into 2 levels as following $\geq 85\%$ (62:74 marks) is considered as satisfactory knowledge and $>85\%$ (0:61 marks) is considered as unsatisfactory knowledge.

Part III: represents the factors affecting community health nurses' performance toward prevention of communicable disease for children under five years , it included 3 questions (Q1- Q3) covered the factors affecting community health nurses' performance related to nursing personnel , infrastructures and working conditions

Scoring system of factors affecting community health nurses' performance toward prevention of communicable disease for children under five years :

For each factor affecting community health nurses' performance toward prevention of communicable disease for children under five years, each item checked as fulfilled was scored 1 and wasn't checked zero, these scores were converted into percent scores.

2nd tool: An observational checklist (Appendix 3)

It consisted of 6 checklists Intra-dermal, subcutaneous, intramuscular, hand washing checklists are adapted from supreme council of universities, the health education checklist was adapted at standard way from (Guilbert, 2013) and the vaccination checklist was adapted from (II, 2017) and was adopted by the investigator to fit the protocols followed in the Egyptian Ministry of Health and Population.

This tool used to assess performance of nurses in prevention of communicable disease for children under five years.

I. The vaccination checklist consisted of 3 phases:

A. Nurse's practical skills for Pre-vaccination steps that contained 31 items regarding assess the pre training of nurses, work area, nursing observation for the child who vaccines, planning catch-up vaccination.

B. Nurse's practical skills for vaccination administration steps that contained 13 items regarding assess storage of vaccination, safe handling technique for vaccination and safe administration by using the right route and the right site according to the type of vaccine.

C. Nurse's practical skills for post-vaccination steps that contained 27 items regarding assess the safe disposal way for the clinical wastes , the nursing observation of the reaction of the injection ,the identification of the side effect (simple and complicated) and how to manage it , right documentation of the vaccination process and sending the information of the vaccination process electronically.

Scoring system of total performance of nurses about vaccination procedure :

For each of the practice items about immunization procedure, each observed item, scored as either done = 1 or not done = zero. The sum of the total practices were calculated and transferred to percentage

The total score for all items related to it was 70 points and categorized

into 2 levels as following > 75% (53:70 marks) is considered as adequate practices and <75% (0:52 marks) is considered as inadequate practices .

I. Intramuscular injection (IM) checklist to assess the nurse's skills about the safe IM injection by the right way and the right site which consisted of 43 items.

Scoring system of total performance of nurses about IM injection procedure :

For each of the practice items about IM injection procedure, each observed item, scored as either done = 1 or not done = zero. The sum of the total practices were calculated and transferred to percentage

The total score for all items related to IM injection procedure was 43 points included preparation checklist and categorized into 2 levels as following > 75% (32:43 marks) is considered as adequate practices and <75% (0:31 marks) is considered as inadequate practices.

II. Subcutaneous injection (S.C) checklist to assess the nurse's skills about the safe SC injection by the right way and the right site which consisted of 38 items.

Scoring system of total performance of nurses about SC injection procedure :

For each of the practice items about SC injection procedure, each observed item, scored as either done = 1 or not done = zero. The sum of the total practices were calculated and transferred to percentage

The total score for all items related to SC injection procedure was 38 points included preparation checklist and categorized into 2 levels as following > 75% (29:38 marks) is considered as adequate practices and <75% (0:28 marks) is considered as inadequate practices.

III. Intra-dermal injection (ID) checklist to assess the nurse's skills about the safe SC injection by the right way and the right site which consisted of 39 items.

Scoring system of total performance of nurses about ID injection procedure :

For each of the practice items about ID injection procedure, each observed item, scored as either done = 1 or not done = zero. The sum of the total practices were calculated and transferred to percentage

The total score for all items related to ID injection procedure was 39 points included preparation checklist and categorized into 2 levels as following > 75% (29:39 marks) is considered as adequate practices and <75% (0:28 marks) is considered as inadequate practices.

IV. Hand-washing checklist to assess the nurse's skills about self-hygiene to safe vaccination administration which consisted of 21 items.

Scoring system of total performance of nurses about Hand Washing procedure :

For each of the practice items about Hand Washing procedure, each observed item, scored as either done = 1 or not done = zero. The sum of the total

practices were calculated and transferred to percentage

The total score for all items related to Hand Washing procedure was 21 points and categorized into 2 levels as following > 75% (16:21 marks) is considered as adequate practices and <75% (0:15 marks) is considered as inadequate practices.

V. Health Education checklist to assess the nurse's skills about Identify priority community health problems related to communicable disease prevention which contain 29 items regarding assess priority personnel needs according to detected problems, proper selection of the place, time, topics and instruments used for health education, Nurses' ability to present the health topics using the available instruments, Presentation skills, obtain Positive feedback .

Scoring system of total performance of nurses about Health education procedure :

For each of the practice items about Health education procedure, each observed item, scored as either done = 1 or not done = zero. The sum of the total practices were calculated and transferred to percentage

The total score for all items related to Health Education procedure was 29 points and categorized into 2 levels as following > 75% (22:29 marks) is considered as adequate practices and <75% (0:21 marks) is considered as inadequate practices.

Scoring system of total nurses' performance toward prevention of communicable diseases among children under five years :

Total nurses' Performance score toward prevention of communicable diseases among children under five years was 240 points and categorized into 2 levels as following > 75% (180:240 marks) is considered as adequate performance and <75% (0:177 marks) is considered as inadequate performance as mentioned in (Guilbert 2013).

II. Content Validity and reliability :

Content and face validity were performed by 5 professors of the 5 expertise, 3 of them were professors of Community Nursing and 2 of them specialized in Pediatric Nursing, Faculty of Nursing, were affiliated to Ain Shams University, who reviewed the tools for content accuracy. The developed tools were tested for reliability on a sample of 12 subjects, the reliability test of translated version was established by using the Cronbach alpha and Spearman correlation which showed good internal consistency constructs validity.

Operational design:

This design includes the preparatory phase, pilot study, and fieldwork.

Preparatory phase:

A review of literature was done regarding current and past available literature, covering the various aspects of the problem, using text books, articles, magazines and internet sites through research gate. This was necessary for the investigator to get acquainted with, and oriented about aspects of the research problems, as well as to assist in development of data collection tools.

Pilot study:

A pilot study was carried out on 12 nurses approximately 10% of the study sample to assess the feasibility of the study and the applicability of the tools. It was conducted in primary health care centers other than those included in the study sample. The tools were finalized according to the pilot results. It also helped in the estimation of the time needed to fill in the forms and they excluded from the main study sample.

Fieldwork :

Official permission was obtained to perform the study. The actual process of data collection was carried out in the period from the beginning of March 2018 to the end of July 2018 Data were collected 2 days / week starting from 10 am to 1 pm in order to collect the total sample.

The investigator interviewed himself to the PHC unit administrator and other health team work that help him in data collection to save the time , All attended nurses fulfilling study criteria were included. All participants were informed about purpose of the study. Oral consent was obtained from each participant. At the beginning of interview the investigator briefly explained the aim of the study to nurses to gain their confidence and trust to convince them to participate in the study. Interview was conducted in groups .

The interviewing Arabic questionnaire sheets were distributed after explaining the way to fill it within (20-30 minutes) to assess total knowledge of nurses regarding prevention of communicable diseases and the factors affecting their performance, the investigator was present all time to respond to any queries. The filled forms were collected and checked for completeness.

The observational checklist for vaccination procedure was completed within (20-30) minutes; each of other checklists for IM, ID, SC Injection procedure, hand washing and health education procedure was completed within (15-20) minutes. The investigator repeated the previous steps until finished predetermined numbers of total study sample (116) pregnant nurses.

Administrative design:

Before conducting the study, official steps were taken to get the official approvals from pertinent authorities. This was done through letters addressed from the Dean of the Faculty of Nursing, Ain-Shams University to the administration of the Medical and Health affairs in Qalubia involved. Then, the investigator met with the directors of the selected primary health care units to clarify the aim of the study, take their approvals, and arrange for data collection.

Ethical considerations:

Approval of the study protocol was secured from the investigator ethics committee in the Faculty of Nursing at Ain-shams University. A verbal in-

formed consent was obtained from each nurse before collecting any data and after explanation of the study aim and procedures, as well as the rights to refuse or withdraw. Nurses were also informed that any obtained information would be confidential and not used outside this study. No harmful processes were performed or used, and no foreseen hazards were anticipated. **Statistical Design:**

Data were coded, scored, tabulated, and analyzed by using Microsoft office excel 2007, while statistical analysis was done using the Statistical Package for Social Sciences (SPSS), version 19.0. Quality control was done at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables. Qualitative variables were compared using Chi-square test (X^2).

Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones .

The significance of the results was considered as not significant*, if $P > 0.05$; significant**, if $P < 0.05$; and highly significant***, if $P < 0.001$.

Results:**Table (1): Distribution of the study sample of nurses in MCH centers according to their socio- demographic characteristics (n=116).**

Characteristics	No	%
Gender		
Male	2	1.7
Female	114	98.3
Age		
20: < 30	13	11.2
30: < 40	42	36.2
40: < 50	39	33.6
50 +	22	19.0
Educational level		
Technical secondary schools	98	84.5
Technical health institute.	10	8.6
Bachelor	8	6.9
Marital status		
Married	111	95.6
Single	3	2.6
Divorced	1	0.9
Widow/ widower	1	0.9
Years of experience in this field		
< 1 year	0	0
1: < 5	5	4.3
5: < 10	12	10.3
10 +	99	85.4
Monthly income		
1500: < 2000 LE.	16	13.8
2000: < 3000 LE.	79	68.1
> 3000 LE.	21	18.1
Financial sufficiency		
Sufficient	44	37.9
Insufficient	72	62.1
Previous attendance of training program about communicable diseases prevention		
Yes	19	16.4
No	97	83.6
Number of training programs attended (n=19)		
One	14	73.7
Two	3	15.8
Three	1	5.5
Four	1	5.5

Table (1): Shows that 98.3% of study sample of nurses who concerned with providing primary health care for children under five years were female, 36.2% of them their age ranged from 31 to 40 years and 95.7% of them were married .As regard to level of education, 84.5% were graduates of technical secondary school of Nursing and the rest of the studied nurses 8.6% and 6.9% were either graduates of technical health insti-

tute or Bachelor respectively .Also the table presents that, there were 85.3% of nurses had more than 10 years of experience in this field. There was 83.6% of nurses never attend any previous training programs, 16.4% of them attended training program, while 73.7% out of them had attended only one training program.

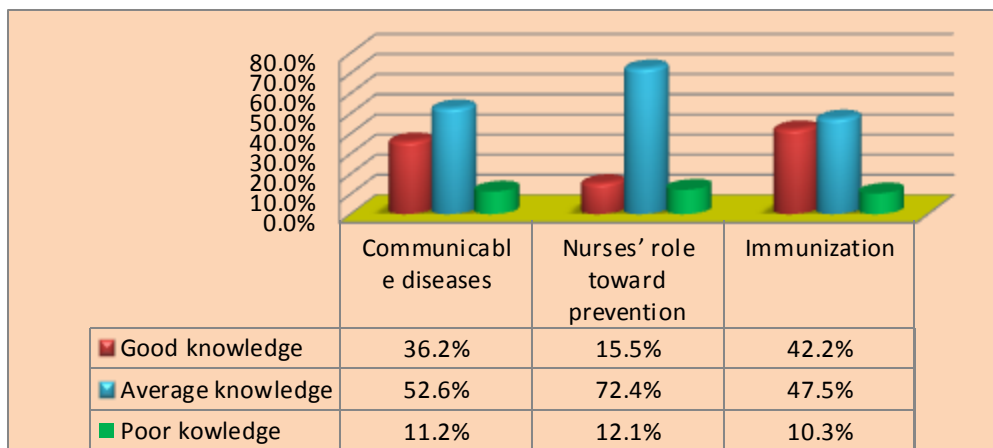


Figure (1): Illustrated that, there was 52.6% of nurses had average level of knowledge regarding communicable diseases and 72.4% of them about their role toward prevention of communicable diseases while, 42.2% of them had good level regarding immunization.

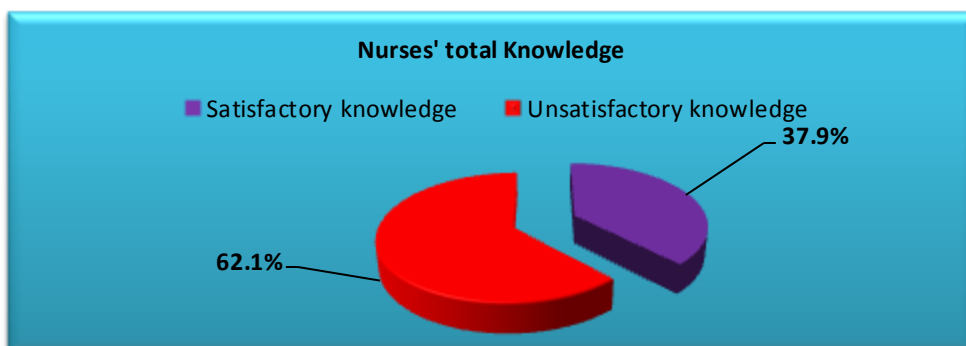


Figure (2): Regarding the total knowledge about prevention of communicable diseases this table illustrated that, 62.1% of study sample of nurses had unsatisfactory knowledge.

Table (2): Distribution of study sample of the community health nurses according to their performance regarding the Health Education (n=116).

Steps	Done		Not done	
	No	%	No	%
Getting ready				
Identify priority community health problems related to communicable disease prevention	0	0	116	100.0
List priority personnel needs according to detected problems.	0	0	116	100.0
Developing specific educational objectives.	0	0	116	100.0
Determine target group of population	116	100.0	0	0
Determine characteristics of target group.	0	0	116	100.0
Prepare well for health education by :				
Proper selection for the place.	0	0	116	100.0
Proper selection for the time.	0	0	116	100.0
Proper selection for the topics according to target group needs.	116	100.0	0	0
Preparation of the required health message.	116	100.0	0	0
Preparation of the required materials.	0	0	116	100.0
Welcome the attended group and present the main goal of health education session	116	100.0	0	0
Assure necessary privacy.	0	0	116	100.0
Introduce yourself.	116	100.0	0	0
Procedure				
Give complete attention to the client.	116	100.0	0	0
Present the information in easy, direct and attractive way.	116	100.0	0	0
Encourage the client to ask question.	0	0	116	100.0
Answer the client questions clearly in health education session to discuss and solve health problems.	0	0	116	100.0
Help the client to take a decision to change his/her unhealthy attitude.	0	0	116	100.0
Repeat the instruction.	116	100.0	0	0
Using the proper instrument like photos, brochures, posters and videos.	0	0	116	100.0
Allow participants to give feedback frequently.	0	0	116	100.0
Listen with empathy to encourage participants discuss the health problems, negative health behaviors and suggest the appropriate solutions.	0	0	116	100.0
Summarize the topics at the end of the session to ensure clear understanding.	0	0	116	100.0
Finish the health educator the session at time detected before.	0	0	116	100.0
Evaluate each participant has reached ,failed to reach to the educational objectives using any measurement technique (pretest and posttest)	0	0	116	100.0
Post Procedure Activities				
Document the result in complete, concise and accurate manner.	116	100.0	0	0
Communicate findings to other health care providers.	0	0	116	100.0
Evaluate the educational program using observation the unhealthy behavior change or not.	0	0	116	100.0
Determine the obstacles.	0	0	116	100.0

Table (2) In relation to the health education procedures this table reveals that, all nurses 100% didn't apply some steps such as list priority personnel needs according to detected problems, developing specific educational objectives, determine characteristics of target group, prepare well for health education by proper selection for the place, time, and the required materials, also didn't apply all steps of implementation procedure except give complete attention to the client, present the information in easy, direct and attractive way, and repeat the instruction.

Table (3): Distribution of study sample according to the factors affecting community health nurses' performance toward prevention of communicable disease for children under five years (n=116).

Factors affecting nurses' performance	No	%
I- Factors affecting nursing performance related to nursing personnel.		
Lack of adequate training about preventive measures of infectious diseases.	37	31.9
Overload of work with limited time.	85	73.3
Assign nurses too many non-nursing work.	109	94.0
Lack of health awareness of low educated mothers about prevention of infectious diseases.	47	40.5
Lack of mother's response to health education about modifying bad health habits.	63	54.3
Mothers prefer to make follow up through private clinics.	44	37.9
II- Factors affecting nursing performance in relation to infrastructure		
The lack of clean service workers and the accumulation of hazardous waste in the MCH center and improper disposal.	81	69.8
Lack of an equipped room to conduct health education sessions for mothers.	116	100.0
Existence of maintenance problems of the building.	42	36.2
There is no hand wash basin in some service delivery rooms for the beneficiaries.	75	64.7
There is no place for isolation of infected children.	44	37.9
Lack of infection control supplies.	116	100.0
No sterilization	0	0
III- Factors affecting nursing performance in relation to working conditions		
Lack of a committee of infection control.	21	18.1
Lack of policy used to refer infected children.	35	30.2
There is no actual follow-up of nurses to infected children after referral to the hospital.	59	50.9
There is no accountability for nurses errors	20	17.2
There is no support and motivation for nurses to encourage them to work	93	80.2

- (Not mutual exclusive)

Table (3) Clarifies that, regarding the factors affecting nursing performance related to nursing personnel there was 94.0% of nurses reported that the main factor was assigning nurses many non-nursing work. All of nurses 100% mentioned that, the factors affecting nursing performance in relation to infrastructure were lack of an equipped room to conduct health education sessions for mothers and lack of infection control sup-

plies. As regard factors affecting nursing performance in relation to work-ing conditions, there was 80.2% of nurses said that, there is no support and motivation for nurses to encourage them to work.

Table (4): The correlation between total community health nurses' performance and the factors affecting their performance toward prevention of communicable disease for children under five years (n=116).

Factors affecting nurses' performance	Total nurses' performance	
	Spearman's rank correlation coefficient r	P value
I- Factors affecting nursing performance related to nursing personnel.		
Lack of adequate training about preventive measures of infectious diseases.	-0.033	0.364
Overload of work with limited time.	-0.087	0.175
Assign nurses too many non-nursing work.	0.074	0.215
Lack of health awareness of low educated mothers about prevention of infectious diseases.	0.017	0.429
Lack of mother's response to health education about modifying bad health habits.	- 0.181*	0.026
Mothers prefer to make follow up through private clinics.	0.002	0.490
II- Factors affecting nursing performance in relation to infrastructure		
The lack of clean service workers and the accumulation of hazardous waste in the MCH center and improper disposal.	-0.031	0.372
Lack of an equipped room to conduct health education sessions for mothers.		1.00 No relation
Existence of maintenance problems of the building.	0.063	0.249
There is no hand wash basin in some service delivery rooms for the beneficiaries.	-0.059	0.265
There is no place for isolation of infected children.	0.002	0.490
Lack of infection control supplies.		1.00 No relation
No sterilization		1.00 No relation
III- Factors affecting nursing performance in relation to working conditions		
Lack of a committee of infection control.	0.040	0.336
Lake of policy used to refer infected children.	-0.043	0.322
There is no actual follow-up of nurses to infected children after referral to the hospital.	0.073	0.219
There is no accountability for nurses errors	-0.056	0.276
There is no support and motivation for nurses to encourage them to work	0.035	0.353

(*) Statistically significant at $p < 0.05$

(**) statistically significant at $p < 0.01$

Table (4) illustrates the presence of a strong negative statistically significant correlation between the total scores of nurse's performance and factors affecting their performance toward prevention of communicable disease for children under five years related to lack of mother's response to health education about modifying bad health habits ($r = -0.181$).

Figure (3): Distribution of nurses according to their performance regarding Vaccination, Hand Washing, Health Education, Intradermal Injection, Intramuscular Injection, and Subcutaneous Injection (n=116).

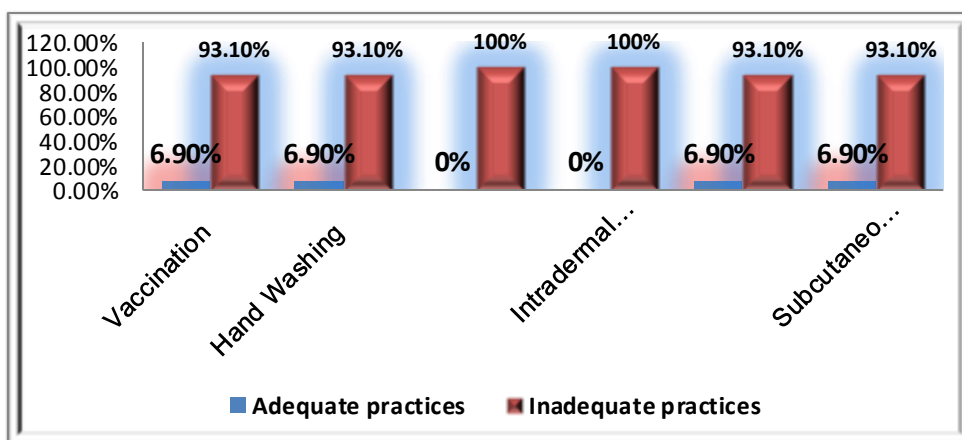


Figure (3): Illustrates that 93.1% of nurses performed vaccination, hand washing, intramuscular injection, and subcutaneous injection procedures inadequately as well; all of them (100%) had inadequate level of practices regarding health education and intradermal injection.

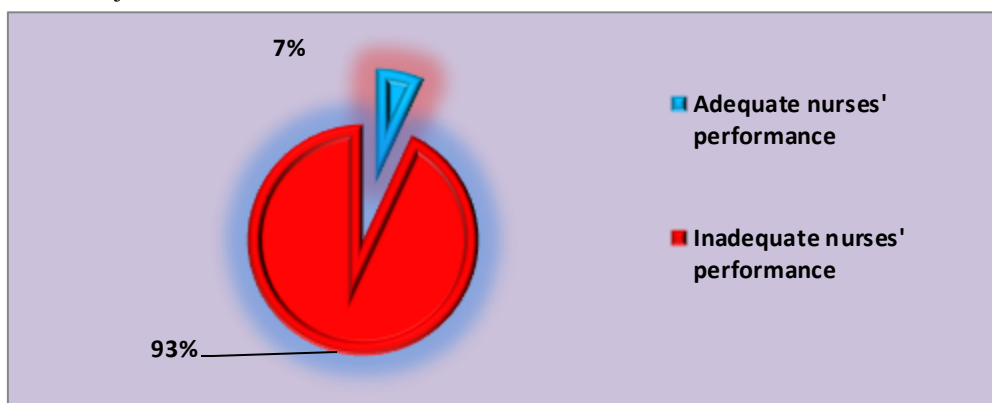


Figure (4): Distribution of nurses according to their performance regarding prevention of communicable diseases (n=116).

Figure (4): Illustrates that there was 93% of study sample of nurses had inadequate level of performance regarding prevention of communicable diseases among children under five.

Table (5): The relation between total knowledge of community health nurses regarding prevention of communicable disease for children under five years and their socio-demographic characteristics (n=116).

Socio-demographic characteristics	Satisfactory knowledge (n=44)		Unsatisfactory knowledge (n=72)		Chi-Square X ²	P value*
	No	%	No	%		
Gender						
Male	0	.0%	2	1.7%	1.244	0.265 NS
Female	44	37.9%	70	60.3%		
Age						
20: < 30	7	6.0%	6	5.2%	4.876	0.181 NS
30: < 40	19	16.4%	23	19.8%		
40: < 50	10	8.6%	29	25.0%		
50 +	8	6.9%	14	12.1%		
Educational level						
Technical secondary schools	32	27.6%	66	56.9%	14.269	0.001* S
Technical health institute.	4	3.4%	6	5.2%		
Bachelor	8	6.9%	0	.0%		
Marital status						
Married	44	37.9%	67	57.8%	3.193	0.363 NS
Single	0	.0%	3	2.6%		
Divorced	0	.0%	1	.9%		
Widow/ widower	0	.0%	1	.9%		
Years of experience in this field						
< 1 year	0	0.0	0	0.0	2.056	0.358 NS
1: < 5	3	2.6%	2	1.7%		
5: < 10	6	5.2%	6	5.2%		
10 +	35	30.2%	64	55.2%		
Monthly income						
1500: < 2000 LE.	7	6.0%	9	7.8%	1.069	0.586 NS
2000: < 3000 LE.	31	26.7%	48	41.4%		
>3000 LE.	6	5.2%	15	12.9%		
Financial sufficiency						
Enough	13	11.2%	31	26.7%	2.117	0.146 NS
Not enough	31	26.7%	41	35.3%		
Previous attendance of training program about communicable diseases prevention						
Yes	9	7.8%	10	8.6%	0.860	0.354 NS
No	35	30.2%	62	53.4%		
Numbers of training programs (n=19)						
One	6	5.2%	8	6.9%	6.416	0.170 NS
Two	3	2.6%	0	.0%		
Three	0	.0%	1	.9%		
Four	0	.0%	1	.9%		

* Significant *P-value <0.05

Table (5) Demonstrates that, there was significant statistical relation between total knowledge of community health nurses regarding prevention of communicable disease for children under five years and their educational level with $X^2 = 14.269$ and P value = 0.001.

Table (6): The relation between performance of community health nurses regarding prevention of communicable disease for children under five years and their socio-demographic characteristics (n=116).

Socio-demographic characteristics	Adequate performance (n=8)		Inadequate performance (n=108)		Chi-Square X^2	P value*
	No	%	No	%		
Gender						
Male	0	.0%	2	1.7%	0.151	0.698 NS***
Female	8	6.9%	106	91.4%		
Age						
20: < 30	4	3.4%	9	7.8%	16.508	0.001 S*
30: < 40	4	3.4%	38	32.8%		
40: < 50	0	.0%	39	33.6%		
50 +	0	.0%	22	19.0%		
Educational level						
Technical secondary schools	0	.0%	98	84.5%	116.000	0.000 HS**
Technical health institute.	0	.0%	10	8.6%		
Bachelor	8	6.9%	0	.0%		
Marital status						
Married	8	6.9%	103	88.8%	.387	0.943 NS***
Single	0	0.0%	3	2.6%		
Divorced	0	0.0%	1	0.9%		
Widow/ widower	0	0.0%	1	0.9%		
Years of experience in this field						
< 1 year	0	0%	0	0%	31.751	0.000 HS**
1: < 5	3	2.6%	2	1.7%		
5: < 10	3	2.6%	9	7.8%		
10 +	2	1.7%	97	83.6%		
Monthly income						
1500: < 2000 LE.	2	1.7%	14	12.1%	2.398	0.301 NS***
2000: < 3000 LE.	6	5.2%	73	62.9%		
>3000 LE.	0	.0%	21	18.1%		
Financial sufficiency						
Enough	2	1.7%	42	36.2%	610	0.435 NS***
Not enough	6	5.2%	66	56.9%		
Previous attendance of training program about communicable diseases prevention						
Yes	2	1.7%	17	14.7%	466a	0.495 NS***
No	6	5.2%	91	78.4%		
Numbers of training programs (n=19)						
One	1	.9%	13	11.2%	3.491	0.479 NS***
Two	1	.9%	2	1.7%		
Three	0	.0%	1	.9%		
Four	0	.0%	1	.9%		

Table (6) Presents that, there was significant statistical relation between performance of community health nurses regarding prevention of communicable disease for children under five years and their age with $X^2 = 16.508$ and P value = 0.001. Also there were highly significant statistical relations between the performance of community health nurses and their educational level and years of experience in this field with $X^2 = 116.000$ and 31.751 respectively and P value > 0.001.

Table (7): The relation between total nurses' knowledge and their total performance regarding prevention of communicable disease among children under five years (n=116).

Total performance		Total knowledge		Total	Chi-Square X^2
		Satisfactory knowledge	Unsatisfactory knowledge		
Adequate performance	perfor-	8	0	8	$X^2 = 14.061$ $P = 0.000$ HS**
		6.9%	0.0%	6.9%	
Inadequate performance	perfor-	36	72	108	
		31.0%	62.1%	93.1%	
Total	No	44	72	116	
	%	37.9%	62.1%	100.0%	

** High Significant

Table (7) Presents that; there was a highly significant relation between total nurses' knowledge and their total performance regarding prevention of communicable disease among children under five years with $X^2 = 14.061$ and P value > 0.001.

Discussion:

Children are susceptible to a variety of communicable diseases and illnesses. They can catch diseases and illnesses by interacting with other children and staff, and by eating contaminated food. Diapering infants and toddlers is the most important factor associated with high rates of intestinal infection in child care settings. Regarding the care provided by the nursing team to children with CD, the following interventions are highlighted: venous puncture, medication dosages and precaution measures, as well as the strategies of the team used to provide this care **Guidelines for Communicable Disease Prevention (2015)**.

The aim of this study to assess the nursing performance related to prevention of communicable disease among children under five years

Part (I): This part represents socio-demographic characteristics of the study sample of nurses concerned with prevention of communicable diseases.

Based on the findings of the current study, the vast majority of nurses was female, was graduates of technical secondary school of Nursing, and had more than 10 years of experience in this field (**Table 1**).

The demographics of current study agree in many aspects with those of many other studies done among

nurses. In terms of gender, majority of the participants in this study were females and was graduates of technical secondary school of Nursing similar to that of **El Shazlya Khalilb, Ibrahema and Abdel Wahed (2016)** Who studied Knowledge and practice of healthcare providers as regards routine children vaccination in primary healthcare facilities of Qewisna District, Menoufia Governorate, Egypt reported that the majority of the sample were females and were diploma nurses.

Part (II): This part answer the research question number 3 "what are the factors affecting knowledge and performance of community health nurses regarding prevention of communicable diseases for children under five years?"

Regarding the factors affecting nursing performance related to nursing personnel, the majority of nurses reported that the main factor was assigning nurses many non-nursing work. All of nurses reported that, the factors affecting nursing performance in relation to infrastructure were lack of an equipped room to conduct health education sessions for mothers and lack of infection control supplies. As regard factors affecting nursing performance in relation to working conditions, more than two third of nurses said that, there is no support and motivation for nurses to encourage them to work (Table 3).

Fahim, El – kreem, Marzouk and Shehata (2011) who studied nurses' practices regarding to infection control during vaccination in children at el Minia, Egypt, reported that regarding the factors affecting nursing performance; lack of nurses' time, extreme tiredness, inadequate work experience and inappropriate work environment

may be related to the medication administration errors made by the nurses.

Regarding obstacles the hinder compliance with infection control standards precaution, **El- Greeb, Ahmed, Atia and Abdel- Mouty (2018)** who studied assessment of Nurses' Compliance with Infection Control Standard Precautions at Outpatient Clinics of Urology and Nephrology Center - Mansura University, Egypt, showed that, the present study showed that the main work barriers were workload and insufficient staff, while the main human barriers were lack of personal protective equipment resources. In addition, the main barriers during attending training course were workload .

While **Awases, Bezuidenhout and Roos (2013)** who studied, Factors affecting the performance of professional nurses in Namibia, who presented that, more than a third of the respondents indicated that their performance were not reviewed and indicated that the reviews took place in an informal when there was a performance problem. Also the respondents said the results of performance appraisals were not used, More than a half of the respondents disagreed with the availability of the necessary instruments, that the instruments were in working condition, Half of the respondents disagreed with the statement that the work environment was safe and hazard free, also increase in the workload resulted in increased absenteeism and a decrease in quality of care

In relation to the health education procedures the present study reveals that, all nurses didn't apply some steps such as list priority personnel needs according to detected problems, developing specific educational objec-

tives, determine characteristics of target group, prepare well for health education by proper selection for the place, time, and the required materials, also didn't apply all steps of implementation procedure except give complete attention to the client, present the information in easy, direct and attractive way, and repeat the instruction (**Table 2**).

This confirms the previous results of **Barber-Paker (2012)** who studies, integrating patient teaching into bedside patient care participant-observation study of hospital nurses. Patient Education and Counseling claimed that patient education was based on nurses' assumptions of patient needs. In this study, no need assessment instruments were used to obtain a deep insight of patients' knowledge expectations, instruments, including assessment tools could have proved useful. In planning, the preparation for patient education was insufficient, and the objectives were deficient. Also indicated that patient education was not planned, and no clear goals were set for it

These findings disagreed with **Kelo, Martikainen and Eriksson (2015)** who studied Patient Education of Children and Their Families: Nurses' Experiences, Finland, reported that in this study, nurses used empowering education and described adequate preparation and objectives based on individual needs. The preparation was composed of practical arrangements and accounting the background of the participants, therefore suggested that patient education objectives should be specific, achievable and measureable. In this study, these requirements were primarily met.

All of nurses didn't help the client to take a decision to change his/her unhealthy attitude related to from point

of view of investigator that the nurses and mothers are so busy with other duties.

All of nurses didn't use the proper instrument like photos, brochures, posters related to from point of view of investigator that facilities didn't deliver from the ministry of Health and Population.

The present study illustrates that all of nurses had inadequate level of practices regarding health education and intradermal injection (**Figure 3**).

This finding related to from point of view of investigator intradermal injection for vaccination need more organized training accredited from ministry of health and population and health education depended on the level of nurses' education so most of nurses had low level of education as presented in (**Table 1**)

Part (III): This part represents the answers of research questions.

The present study demonstrated that, there was significant statistical relation between total knowledge of community health nurses regarding prevention of communicable disease for children less than five years and their educational level (**Table 5**).

These finding is in agreement with, **Fahim, El-kreem , Marzouk and Shehata (2011)** who indicated that total scores of nurses' knowledge who attended training courses about infection control were higher than those who didn't attend.

These findings contradicted by **Arhaim and Elzahaf (2016)** who reported that The younger age of studied sample the higher percentage of those

adequately performed their activities regarding control and prevention of communicable diseases. Also, majority of those who had nursing bachelor and training courses twice performed their duties in this activity adequately. However, there was no statistical relation between the performance of community health nurses and their sociodemographic character.

There was a highly significant relation between total nurses' knowledge and their total performance regarding prevention of communicable disease among children under five years (Table 7).

These findings supported by **Bahgat, Ramadan and El – Salieh (2013)** that demonstrated Nurses' Perception and Developing an Improvement Plan Regarding Child Safety in Benha Hospitals, Egypt, Who found that, there was statically significant relation between total knowledge, perception and performance. Therefore, mentioned that the formal training courses plays an important role in enhancing and updating nurses' knowledge, perception and performance besides improving the quality of child care.

Part (IV): This part represents the correlation between total community health nurses' performance and the factors affecting their performance toward prevention of communicable disease for children under five years.

The present study illustrated that, the presence of a strong negative statistically significant correlation between the total scores of nurse's performance and factors affecting their performance toward prevention of communicable disease for children under five years

related to lack of mother's response to health education about modifying bad health habits (Table 4).

In accordance with **Wandur et al (2016)** who studied the performance of community health workers in the management of multiple childhood infectious diseases in Lira, northern Uganda, emphasized that there were statistically significant correlation between nurse's performance and factors affecting their performance toward statistically significant correlation between the total scores of nurse's performance and factors affecting their performance toward prevention.

Conclusions

The results of study conduce to the conclusion and research questions that majority of study sample of nurses who concerned in the study were female, married, more of them were graduates of technical secondary school of nursing also more of nurses had more than 10 years of experience in this field and never attend any previous training programs.

More nurses in the study settings had unsatisfactory knowledge about their role toward prevention of communicable diseases among children under five years.

There was significant statistical relation between total knowledge of community health nurses regarding prevention of communicable disease for children under five years and their educational level, there was significant statistical relation between performance of community health nurses regarding prevention of communicable disease for children under five years and their age, educational level and years of experience in this field, There was a highly

significant relation between total nurses' knowledge and their total performance regarding prevention of communicable disease among children under five years.

Presence of a strong negative statistically significant correlation between the total scores of nurse's performance and factors affecting their performance toward prevention of communicable disease for children under five years related to lack of mother's response to health education about modifying bad health habits.

Recommendations:

In the light of the findings of current study the following recommendations are suggested:

- Continuous supervision and evaluation for nurses concerned with child health care is required to determine the defect related to their knowledge or practice regarding communicable diseases prevention.
- Written guidelines should be available in vaccination centers about Prevention of Communicable Disease, cold chain, schedule, contraindications of vaccines plus side effects and how to deal with based on evidence nursing practice.
- All nurses should commit to the job description and shouldn't assign any non-nursing work, severe punishment for non-committed nurses.
- Nurses should be encouraged to attend specific meeting as workshop and seminars to be acquainted with most recent advances and skills in the field.

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