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Effect of Training Program regarding Practicing Universal Precaution Measures for Infection Control among Maternity Nurses

M.Fatma[1], Inass Kassem[2], Azza mohamed[3], Sohair Hassen[4]

[1]Head Nurse of infection control unit at National Liver Institute, Menoufia University

[2] Professor of Maternal and Newborn Health Nursing, Faculty of Nursing, Menoufia University

[3] Professor of Microbiology department, National Liver Institute, Menoufia University

[4] Lecturer in Maternal and Newborn Health Nursing department, Faculty of Nursing , Menoufia University

Abstract: **Background: Applying standard precautions at all times and to all patients, will minimize the risks of infections.**

Purpose of study: To identify the effect of a training program regarding practicing universal precaution measures for infection control among maternity nurses. Methods: Research Design: - Quasi experimental design. Sample: Convenient sample of 100 nurses Setting: obstetric & gynecological department in University hospital and Shebin El-kom Teaching hospital. Tools: Two instruments were used throughout the course of study (1) interviewing questionnaire, (II) Observation checklist (pre and post-test) was used to determine nurses' practice regarding implementation of universal precautions. The evaluation of the effectiveness of educational was assessed after 3 months by reassessing the nurses' knowledge and practices regarding universal precautions of infection control.

***Results*: Our data showed highly significant difference in nurse's practices of universal precaution of infection control pre and post intervention .After intervention the majority of nurse's showed improvement in their knowledge and practice regarding universal precaution of infection program Conclusion: The use of educational program is effective in improving maternity nurses' knowledge and practices toward universal precaution of infection control. Recommendation Conducting follow –up tests for nurses to ensure their competence related to practice of universal precaution of infection control to maternity nurses.**

Keywords: **infection control- Universal precautions– maternity nurses.**

1. OPERATIONAL DEFINITION

Universal precautions

Refers to the practice, in medicine, of avoiding contact with patients' body fluids, by means of the wearing of nonporous articles such as medical gloves, goggles, and face shields.

Infection control

Refers to the policies that must be applied in area to minimize the risk of spread of infection

Maternity nursing

Nurses that provide care in the obstetric unit to all patients during pregnancy, labor and post-partum

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2. INTRODUCTION

"Universal precautions", (UP) defined by Centers for Disease Control (CDC), are a set of precautions designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other blood borne pathogens when providing first aid or health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other blood borne pathogens **(CDC2012)**. The basic levels of infection control precautions which used, as a minimum, for caring of all patients, include; performing hand washing, wearing personal protective equipment (e.g. gloves, gown, goggle.... etc), respiratory hygiene and cough etiquette, prevention of needle sticks and other sharps-related injuries, patient care equipment and instruments/devices, management of linens and waste disposal (CDC2015).

Health care workers are at high risk of needle stick injury (NSI) and blood borne pathogens (BBP) (Beltrami E.M, **et al., 2000)**. According to a World Health Organization estimate, in year 2002, sharp injuries resulted in 16,000 hepatitis C virus (HCV), 66,000 hepatitis B virus (HBV) and 1000 human immunodeficiency virus (HIV) infections in health-care workers world-wide ***(Pruss-ustun A , et al.,2005)***

Infection control standards become an integral part of the accreditation program for all therapeutic settings in Egypt ***(Eskander H G, et al.,2013).*** Infection control standard precautions include certain measures such as hand hygiene, sharps safety, staff health, use of personal protective equipment (PPE), equipment safety, waste management and environmental cleaning. Many infection control measures, such as appropriate hand hygiene and the correct application of basic precautions during invasive procedures are simple and of low-cost ***(Bouallègue O, et al.,2013).***

Nurses are the core and hands of the health team and they comprise the first line care providers to the patients, who apart from giving drugs or version routine care to patients. This would mean constant contact and exposure with various nosocomial infections present in the hospital setting. It is the duty and responsibility of nurse to strictly comply and observe to the hospital's preventive measures against nosocomial infections and other infectious diseases

Prathibha S V., & Umarani.J(2014).

Nursing education and an in-service training play an important role in improving nurses' knowledge and practices in infection prevention and control measures. So, it is important to, ensure nurses' compliance with these infection control measures, which successively leads to reducing the NIs rate ***(Fashafsheh, et al., 2015)***. However, evaluating the existing level of knowledge and practices represents a prerequisite for planning and developing any new educational program in nursing education. This is because such evaluation provides a useful database to guide the development and implementation of future educational programs on infection prevention and control with the aim of decreasing NIs ***(Dramowski, et al., 2016).***

Significant of the study:

The importance of strong health system as the essential route to achieve improvements in maternal health and reductions in maternal mortality is widely accepted. Effective coverage of maternity services requires timely and affordable access, by all sectors of the population, to appropriate care of sufficient quality and safety to help assure positive health outcomes. Good access, safety and quality are the overriding aims of all health systems and such factors are crucial when considering the problem of infections resulting from childbirth. Improving and maintaining infection control as part of delivery care requires an efficiently functioning health system ***(Seacat & Inglehart, 2013).*** For all this cause the researcher conduct studies to evaluate the Effect of the educational program about infection control for nurses working at Menoufia governorate Universality hospitals and shebien Elkam Teaching hospital.

Purpose of the Study

To examine the effect of a training program regarding practicing universal precaution measures for infection control among maternity nurses.

Research Hypothesis

The nurses will have good knowledge after implementation a training program than before.

The nurses who practice universal precaution measures will improve their practice after the implement program than before.

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3. METHODS

Research Design:

Quasi Experimental design (Pre intervention-Post intervention) was used.

The study was conducted at obstetric & gynecological department in University hospital and Shebin El-kom Teaching hospital. participants

The participants (N= 100) were selected using convenient sample from 500 nurses who attended the obstetric &gynecological department at the study settings and fulfilled the inclusion criteria as well as their willingness to fill in the questionnaires.

Sample Size:-

The sample size is calculated using Kish's (1995) formula

The study population staff nurses who are working in both hospital mention before (100) the working nursing staff in these care hospitals. Prevalence of knowledge as per previous studies was 80%.6 Taking this as P, 5% of allowable error and 10% as non-responders we calculated the final sample size of 100 staff nurses using the formula

n= {Z2 * P (1–P)}/e2 was calculated.

- Z– 1.96 for 95% CI.
- P– Expected true proportion.
- E– Desired precision (1/2 the width of CI).

Technique of sample:-

All nurses that provide care to patient in obstetric &gynecological department who met inclusion criteria were included in this study and would like to participate in it. Random sample of 100 nurses were admitted to this study. [The participate collect them from two hospitals in an equal number in three days every week(Sunday , Monday and Thursday they were present to area and set with the group to give them session.]

Inclusion criteria of the sample:

- Nurses working in obstetric &gynecological department in both hospitals. Their age range between (20-<40).

Instruments of data collection

Three tools were used in the current study to collect the necessary data.

Structured interviewing questionnaire instrument developed by the researcher team after reviewed the related literature; it was consisted of three parts:

- **Part (I):** include the nurses Socio-demographics data such age, education, job, qualifications, years of experience and previous training courses.

- **Part (II)**: Knowledge to assess nurses knowledge about Infection control and standerd precautions: It was modified by researcher and adopted from(Tavolacci *et al.*, 2008; Amin & Al Wehedy,2009) was used it to assess nurse knowledge about Infection Control (IC) and Standard Precautions(Sp) with a total of 60 items of closed ended questions in multiple choice (true or false), such as general concepts of IC and SPs infection control (7 questions), hand hygiene (10 questions), personal protective equipment (PPE) (5questions), sharps disposal and injuries (7 questions) Safety Injection(6questions)Waste disposal**(**10questions) clean &dis infection (6questions) cough etiquette (5questions).health education about immediate vaccination anti B vaccine of new born(5)questions.

- **Part (III):** Observational checklist tool that were adopted from Patricia and Anne, (2005) and Terese and Marlene, (2010); Observational checklist was developed for assessing nurses' practice; this tool was used to evaluate the extent of which the training guidelines affected nurses practice. Observational checklist included procedure related to (hand hygiene, personal protective equipment (gloves, mask, gown), handling sharp instrument, visitors, environmental hygiene, handling laboratory specimen, respiratory hygiene, safe injection practice, urinary catheter, infection control for mechanical ventilator, caring of wound dressing and giving intravenous infusion). It was done during routine work.

Scoring system of nurses practice: Total score of practice test was ranged from 0- 60. One mark was given for done and zero for not done. It was distributed as follow: (hand hygiene 7 score, personal protective equipment 12 score (gloves, mask, gown), handling sharp instrument 7 score, safe injection practice 9 score, caring of wound dressing 8 score, waste disposal7 score, and operation room cleaning10 score). The scored below 60% had poor practice, the scored 60% and more had fair practice and the scored 80% or over had good practice. The World Health Organization (2011) and Centre for Disease Control (2017). **Pilot study**: A pilot study conducted to test feasibility, clarity and applicability of the tool, and to estimate the time needed to make it. It was conducted on 10 nurses of the total sample. They were excluded from the study population to assure the stability of the results and did the necessary modification. The result of pilot study was used to finalized the instrument and schedule the time needed for the fieldwork. Some changes were done in the questionnaire based on the findings of the piloting. **Validity &Reliability**

Validity

The validity of the instrument was established by five qualified experts (two professors in maternal and newborn health nursing department at the faculty of nursing, two physicians from obstetrics and gynecology department at the faculty of Medicine and one physician from microbiology department from national liver institute). They judged the instrument for the content accuracy and internal validity. They were also asked to judge the items for completeness and clarity (content validity). Suggestions were considered and modifications were made.

Reliability

The reliability of the instrument was tested to determine the extent to which items in the tool were related to each other. Pearson correlation co-efficiency was done to test the internal consistency(r=0.96) of all item of the tool.The World Health Organization (2011) and Centre for Disease Control (2017).

Ethical consideration: written letter form the faculty of nursing explaining the purpose of the study will be directed to director of hospital conduct the study. Oral consent took from each participant before enrolling them in the study and after explains the purpose of study. Participants were ensured to maintain the confidentiality. Participants have the right to withdraw from the study at any time without any adverse consequences. There are no any invasive methods will be used during the study.

Approval letters:

An approval to conduct the study was granted from the ethical committee obtained from the dean of faculty of nursing to director of University hospital and director Shebin El-kom Teaching hospital after explanation the purpose of this study.

Field work: The study was carried out through four phases: initial assessment, planning, implementation, and follow up and evaluation. These phases were carried out from beginning of April 2017 to end of October 2017. Covering a long period of one year.

Preparatory Phase

An extensive review related to the study area was done including electronic dissertations, available books, articles and periodicals. A review of literature to formulate knowledge base relevant to the study area was also done. A written permission from the institutional authority of the four settings was obtained before carrying out the study. The researcher prepared the data collection instrument, in addition to seeking the managerial arrangement to carry out the study. Also prepared booklet to help for understands the sessions.

Initial Assessment Phase

At the beginning the researcher distributed the questionnaire to find out the general characteristics of the nurses who received the program of infection control in all level of education .Then application of the study according to the inclusion criteria .The researcher greeted the nurses at the beginning of interview ,introduced herself to all nurses included in the study ,Every nurse was interviewed to collect general socio-demographic data ,previous attended infection control course, in the time between 5 to 10minutes at from the first session.

Implementation phase: this study hypothesized that the nurse's practice of universal precaution measures will improve after the implement program than before. the implementation of program universal precaution of infection control guideline was implemented through small group discussion. It consisted of 6 sessions were conducted for 10 groups each groups had 10 nurses .Three days /week each day special for one group to cover all nurses .Duration of each between 45-60 minutes. The researcher gave session in place of work to nurses .Each session started by summary of previous session and objectives of new session, using very simple slang language to be suitable to nurses education. These education sessions include definition of each key concept and its objectives. The education booklet was used as a learning material.{ Booklet was developed by researcher as guidelines for nurses to use in work}. Different learning methods were used during the educational session namely interactive lecture and discussion.

Pre intervention assesses nurse's practice by self-administrated instrument initial data collection was carried out to obtain information about nurses socio-demographic. The researcher was set with participant to check practice by check list questionnaire pretest to evaluate level of practice. The preliminary assessment showed that the nurse had poor score level of practice, universal precaution of infection control. Further they had negative practice of universal precaution of infection control.

Developing guideline: - According to the preliminary data assessment of practice and evidence recommendations of universal precaution of infection control guideline was developed by the researcher according to nurses practice defect.

Evaluation phase: the last phase in which the researcher assess the achievement of the aim of the study through reintroducing the research tools.

Post intervention determines whether there was effective and comprehensive universal precaution of infection control education by using post intervention.

Follow up intervention after 3 months determine whether there was effective and comprehensive universal precaution of infection control education through evaluation of nurses practice universal precaution of infection control education by using follow up test.

Data analysis

Up on completion of data collection, the collected data were organized, tabulated; each answer sheet was coded and scored. The researcher coded the data into a coding sheet so that data could be prepared for computer use statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 20, SPSS Inc. Chicago, IL, USA). Where the following statistics were applied: Data from questionnaires was being entered as numerical or categorical, as appropriate. Two types of statistics were being done. Descriptive statistics to Quantitative data were being shown as mean, SD, and range. Qualitative data were being expressed as frequency and percent. Analytical statistics Chi square test were used to measure association between qualitative variables. Student t test were being used to compare mean and SD of 2 sets of quantitative normally distributed data, while willcoxon test were being used when this data is not normally distributed. Pearson's correlations were being used to study correlation between two variables having normally distributed data, while Spearman's correlations were be used when this data is not normally distributed. McNemar test were being used to measure association between two dependent qualitative variables.

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4. RESULTS

Table (1): Socio demographic Characters of Nurses Staff (N=100).

Variables	No	%
-Age(Mean±SD):	(26.92±6.292)	
-Age groups:		
✓ 20-30	76	76%
✓ 31-39	14	14%
✓ ≥40	10	10%
Education		
1-Nursing Technician Institute	45	45%
2- Secondary Nursing Diploma	34	34%
4. Bachelor	21	21%
Job		
1-Nurse Supervisor	25	25%
2- Technical Nurse	55	55%
3-Student intership	15	15%
Years of Experience		
1-5	50	50%
5:10	43	43%
10:15	5	5%
=>15	2	2%
Previous attendance of training courses:		
Yes	16	16%
No	84	84%

Table (1) Illustrated that sociodemographic data of nurses staff the age of(76%-14%and10% respectively) ranged between 20-30,31-39 and ≥ 40respectively.according to staff nurses level of education 45%had technical institute nursing,34 had secondary school of nursing while 21had bachelor degree.

The years of experience 50%,43%,5%,2% respectively)range between 1-5,5-10,10-15 ≥ 15respectively)previous at attendance of training program16%attendance while majority 84%not attend.

Table (2): Knowledge of Nurses Staff about Standard Precautions pre &post intervention N=100

Variables	Pre-intervention		Post-intervention		p- value	Chi square
	True	false	True	false		
Standard Precautions protect	54 54%	46 46%	84%	16 16%	.0001	23.117
Content Standard Precautions	45 45%	55 55%	82%	16 16%	.0001	32.185
Personal Protective Equipment	56 56%	44 44%	82%	16 16%	.0001	33.625
Universal precaution include saliva	62 62%	3636%	90%	10 10%	.0001	21.491
Universal precaution not include nasal secretion	56 56%	44 44%	85%	15 15%	.0001	33.523
Universal precaution apply to all patient	42 42%	48 48%	80%	20 20%	.0001	30.349
Universal precaution include hand wash , PPE gloves	49 49%	51 51%	85%	15 15%	.0001	29.158
Universal precaution protect all health worker	42 42%	48 48%	80%	20 20%	.0001	30.349

Table (2): Shows that there was highly significant difference regarding nurse's knowledge about standard precaution pre &post intervention nurse's staff about standard precaution pre& post intervention. (p value>.001) after training program than before, P value <0.001: Highly Significant.

Table (3): Relationship between Nurse's Education and Knowledge of Universal Precaution of Infection Control.

Variables	Education			McNemar	P value
	Supervision	Student	Nurses		
Pre hand					
poor	6	31	2		
fair	1	31	2	7.839	0.988
good	0	21	3		
Post hand					
poor	1	12	0		
fair	1	41	0	12.490	0.014
good	5	33	7		
Post sterilization					
poor	1	18	2		
fair	6	56	3	3.713	0.715
good	0	11	2		
Pre sterilization					
poor	7	84	7	.332	0.998
fair	0	1	0		
good	0	1	0		
Pre waste					
poor	6	81	6		
fair	0	5	0	13.193	0.010
good	1	0	1		
Post waste					
poor	6	74	5		
fair	0	9	2	5.108	0.276
good	1	3	0		
Pre sharp injury					
poor	6	55	5	1.786	0.775
fair	1	27	2		
good	0	4	0		
Post sharp injury					
poor	2	14	0		
fair	5	45	6	6.229	0.398
good	0	1	0		
Pre safety injection					
poor	6	78	7		
fair	1	6	0	1.431	0.839
good	0	2	0		
Post safety injection					
poor	6	70	6	0.862	.930
fair	0	5	0		
good	1	11	1		

Table (3) showed there wasn't significant enunciation between level of nurses education& their knowledge about universal precaution of infection control

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Table (4) Relationship between the nurses age and knowledge of universal precaution of infection control

Variable Age	Mean	P value	T test
Pre *Elements to universal/ standard*			
poor	26.96	.938	.129
fair	27.14		
good	24.50		
Post *Elements to universal/standard*			
poor	29.25	.381	1.931
fair	27.44		
good	26.25		
Pre hand hygiene vaginal exams			
poor	28.03	.098	4. 649
fair	24.97		
good	27.85		
post hand hygiene vaginal exams			
poor	29.54	.626	.938
fair	26.64		
good	26.94		
Pre safety injection			
poor	27.13	.474	1.494
fair	24.29		
goog	27.50		
Post safety injection			
poor	27.07	.409	1.788
fair	25.80		
good	26.94		
Pre sterilization& clean			
poor	26.98	.348	.882
fair	28.00		
good	22.00		
Post sterilization & clean			
poor	26.43	.376	1.958
fair	26.15		
good	28.08		
Post sharp injury			
poor	27.17	.759	.552
fair	27.07		
good	26.59		
Pre sharp injury			
poor	27.38	.381	1.930
fair	26.5		
good	23.00		
Pre waste management			
poor	27.01	.515	1.325
fair	24.40		
good	26.94		
Post waste management			
poor	26.85	.937	.129
fair	27.36		
fair	27.75		

Table (4) show there was no significant enunciation between age and knowledge of universal precaution of infection control.

Table (5): Mean Nurses' Practices about Infection Control pre &post Intervention N=100

Item	Pre intervention	Post intervention	Wilcoxon	P value
Stander precaution	4.37 ±1.12	5.47± 1.07	5.89	.001
Hand hygiene	4.13±1.72	5.13 ± 1.38	4.01	.001
Person protect equipment	2.22 ±1.32	3.85 ± .94	4.07	.001
Waste management	5.74 ± 1.72	7.3 ± 1.46	7.62	.001
Clean& sterilization	3.30 ± 1.65	4.3 ± 1.13	4.9	.001
Safety injection	3.94 ± 1.89	6.9± 1.37	7.77	.158
Sharp	3.02 ± 1.31	4.64 ± 1.17	6.59	.318

Data in table 5: Show improvement in the compliance regarding infection control measures among studied group of nurses from pre-test level stander precaution (4.37 ±1.12) posttest (5.47± 1.07) it was significant t test 5.89 p value <.001.

Table (6): Difference between pre intervention &post intervention overall level of nurse's staff practice score of universal precaution measure of infection control program.

Item	Poor	Fair	Good	Total	P-value
Pre stander precaution **Post stander precaution**	91% 55%	5% 35%	4% 10%	100%	<0.001
Pre hand hygiene **Post hand hygiene**	39% 35%	34% 20%	27% 45%	100%	<0.001
Pre sharp injury **Post sharp injury**	67% 17%	26% 55%	7% 27%	100%	<0.001
Pre safety injection **Post safety injection**	65% 50%	33% 20%	2% 30%	100%	
Prepersonprotectequipment **Postpersonprotectequipment**	50% 35%	30% 20%	20% 45%	100%	<0.001
Predisinfection&sterilization **Postdisinfection&sterilization**	55% 35%	20% 15%	25% 50%	100%	<0.001
Pre wast management **Post wast management**	94% 65%	4% 20%	2% 15%	100%	<0.001

Table (6) show that high significant difference between pre intervention& post intervention of stander precaution practice score of nurses (P value<.001).

5. DISCUSSION

Infection control is a key component of practice for all healthcare professionals including nursing staff, not only for their health but also to reduce infections transmission and thus improve the patient safety.

The finding of the current study succeeded to accept the research hypothesis. Findings are discussed in the following sequences:-

Regarding the nurses in the present study they had no long experience, especially in current job and their qualification, was mostly at the diploma level. These results are in an agreement with **Meltany (2006)** who reported that, the studied sample had higher mean scores of knowledge of nurses who had medium experience and have Secondary Nursing Diploma.

The current study showed that the majority staff nurses weren't trained previously on infection prevention precautions. This finding comes in agreement with result of **Fashafsheh, et al.,** who evaluated the knowledge and practice of nursing staff towards infection control measures and revealed that only one quarter courses were trained . The researchers explained this result due to the similarity of nursing courses in most of universities and the respondents were with poor knowledge that may be due to lack of infection control training.

The Present study showed that the majority of staff nursing interns demonstrated post intervention improvement in their practice regarding general measures of infection control standard precautions include hand hygiene, personal protective equipment, handling sharp instruments, environmental hygiene and handling laboratory specimen than pre intervention. This finding agreed with ***Al-Hussami and Darawad and Rosenthal et al.,*** who found that the educational programs about the infection control precautions significantly influenced the staff nurse practice.

The current study reported no relationship between knowledge or practice regarding infection control and age, years of experience, and training course of the studied group. In this regards ***Hamid et al (2010),*** indicated that, factors such as age and years of experience did not contribute knowledge and practice of infection control. The finding was similar to ***Gijare, (2012)*** who reported that there was no significant statistical difference in pre and posttest knowledge and practice scores of various age groups and different years of experience.

Regarding the nurses' knowledge and practices and their qualifications, the present study revealed non-significant differences regardless nurses who had Bachelor in Nursing Sciences, Diploma of Technical Nursing Institute or Diploma of Secondary Nursing School. The study finding dis agreed with ***Hassan and Aboulazm (2007)*** **who** stated that, the highest mean scores of knowledge and practice was found among nurses with Secondary Nursing Diplom, and also found that there were improvement of scores of knowledge and practice in post program related to invasive procedure. These results are in disagreement with those of ***Abolwafa (2009)*** who found that, the total scores of nurses' knowledge with Diploma of Secondary Nursing School were significantly higher scores than those with Bachelor in Nursing Sciences. Also ***Ahmed (2007)*** reported that, education increases knowledge and practice of nurses having Diploma of Secondary Nursing School.

The Current study showed that in pre intervention, the minority of nurses had good practice of hand hygiene nearly half had poor practice and about third had fair practice but in post intervention third had poor practice, quarter had fair practice and nearly half had good practice the finding was agreement with ***Johnson O, (2013)*** knowledge and practice for prevention of infection in burn unit at a university hospital: suggested nursing guidelines.

Concerning with nurse's practice of safety injection the majority of nurses had poor practice, minor of nurse's had fair and good practice in pre intervention but in post intervention third of nurses had good practice, half had poor practice and nearly quarter had fair practice. That study was agreement with ***Onyemocho et al., (2013)***who assessed the level of knowledge and practice of injection safety among health care workers of Nigerian prison service health facilities in Kaduma State, Command. The study showed that half of the health workers had good practice scores of key injection safety practice; nearly quarter had fair practice while 29% had poor general practice scores. After the program, nurses showed significant improvement for the total practice, in relation to infection control (hand hygiene, person protect equipment, safety injection, sharp injury, disinfection, sterilization, waste management) and total scores of nurses' practice about infection control. The study finding in the same line with **Adinma *et al*. (2009)** who stated that , knowledge of universal precautions measures was good for nurses. In relation to invasive procedure(endotracheal intubation, umbilical vessel catheterization, peripheral intravenous line placement and blood sampling). **Paudyal *et al*., (2008)** found that most of nurses had good scores of knowledge regarding universal infection control precautions. **Badr (2004)** cited that, without clear orientation and enough training for nurses, no clear outcomes could be achieved. This present findings of improvement of nurses' knowledge and practice after exposure to an educational program, is in congruence with **Rance and Trent (2005)** who stat that, improvement of nurses' knowledge and practice was found for the majority of nurses after implementation of the training program about infection control.

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6. CONCLUSION

The current study examined the Effect of a Training Program regarding Practicing Universal Precaution Measures for Infection Control among Maternity Nurses.

The current study concluded that:

- Maternity Nurses knowledge about universal precaution of infection control had been improved highly significantly between pretest and posttest of universal precautions of infection control this answered the research hypothesis the nurses will have good knowledge after implementing the training program than before.
- There was significant difference between the studied groups regarding their nurses practice of infection control after the training program. This answered the research hypotheses that the nurse's practice of universal precaution measures of infection control will improve after implementing the program than before.

7. RECOMMENDATIONS

According to the findings of the current study, the following recommendations are proposed:

1. Continuous training for Nurses in the hospital is essential to infuse the knowledge of standard precautions.
2. Strict and regular adherence to standard Precautions should be reinforced to reduce adverse outcome in healthcare setting.
3. Create awareness about reporting procedure in case of potential exposure.
4. . The reduction of waiting time by health workers for post exposure prophylaxis to infection.
5. Administrative reporting should be developed and constantly reviewed
6. Availability of post exposure prophylaxis instruction and protocol is advocated in all clinical setting.

Suggestions for future studies:

1. A training program about universal precautions of infection control should be held for the health care workers who work in hospital to increase their awareness of the early detection and prevention of infection during work.

2. Replication of this study to further settings using a larger sample.

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