

## Nurse`s Skills Regarding Prevention of Postpartum Infection

\*Fahmy NM, \*\*Omran AA, \*\*Mohammed AI, \*\*Afifi SH M

\*Maternity and Newborn Nursing Faculty of Nursing, Ain shams University,

\*\*Maternal and newborn Health Nursing Faculty of Nursing, Benha University,

### ABSTRACT

**BACKGROUND:** **Aim of the study:** The study aimed to assess nurse's skills regarding prevention of postpartum infection. **Setting:** the current study was conducted at delivery & postnatal unit at Benha University Hospital. **Design:** A descriptive study design. **Sampling:** A convenient sample of a total number of 50 nurses were recruited in the present study. **Tools:** Two tools were utilized for data collection, structured interviewing questionnaire tool and observational checklist. **Results:** The majority of the studied nurses had a good knowledge meanwhile, less than half of them had unsatisfactory practices regarding prevention of postpartum infection. There was a statistical significant between studied nurse's total knowledge and their educational qualification ( $P < 0.05$ ). **Conclusion:** The majority of studied nurses had a good knowledge, on the other hand less than half of them had unsatisfactory practices concerning postpartum infection control measures. **Recommendation;** periodic in-service educational courses for nurses regarding their needs about preventive measures of infection.

**Key words:** Nurse, skills, Postpartum infection

### Introduction

The first hours, days and weeks after childbirth are a dangerous time for both woman and newborn infant. Among more than 500,000 women who die each year, due to complication of pregnancy and childbirth, most deaths occur during or immediately after childbirth. In developed countries, the maternal mortality ratio is about 27 per 100,000 live birth and in the developed countries the ratio is 20 times higher. It varies between 480 and 100,000 live births depending on the regions (WHO, 2011).

Meanwhile, world Health Organization added that, every day in 2015, about 830 women died due to complication of pregnancy and childbirth. Almost all of these deaths occurred in low-resources setting. The

primary causes of death are hemorrhage, hypertension, infection, and indirect causes, mostly due to interaction between pre-existing medical conditions and pregnancy (WHO, 2015).

Postpartum infection is a clinical infection of the genital canal that occurs within 28 days after abortion or childbirth. Infection may be result from bacteria commonly found with in the vagina or from the introduction of pathogen from outside the vagina. The infectious process may remain localized in the reproductive or genital area, urinary tract or breast, or it may progress resulting in metritis, endometritis, peritonitis, such infection is a major cause of maternal death (Karsnitz, 2013).

Meanwhile, endometritis is the most common infection in the postpartum period.

Other postpartum infections include post surgical wound infections, perineal cellulites, mastitis, respiratory complications from anesthesia, retained products of conception, urinary tract infection (UTIs) and septic pelvic phlebitis. Wound infection is more common with cesarean delivery (Bauer et al., 2013).

Half of all postnatal maternal deaths occurs during the first week after childbirth, and the majority of these occur during the first 24 hours. The leading cause of maternal mortality in Africa accounting for 34 percent of death is hemorrhage, the majority of which occurs postnatal. Sepsis and infection claim another 10 percent of maternal death. In Egypt infection ranks third among the direct causes of maternal mortality. It is accounting for 3.9% of all death (Unicef, 2015). There was no study done regarding nurse's skills regarding prevention of postpartum infection in faculty of nursing, Benha university. So, the present study aimed to evaluate nursing skills regarding prevention of postpartum infection.

### **Subjects &Methods**

#### **Technical Design:**

Technical design of the study includes: research design, setting of the study, sample and tools of data collection.

#### **Research design:**

A descriptive design.

#### **(A) Research setting:**

postpartum and labor unit in obstetrics and gynecology department of Benha university hospital.

#### **(B) Sampling:**

##### **\* Sample type:**

Convenient sample

##### **\* Sample size:**

A total number of 50 nurses at postpartum and labor unit in obstetrics and gynecological department at Benha university hospital were recruited in the study.

#### **(C)Tools of Data Collection:**

The following tools were designed and used after reviewing related literature and under supervision of the supervisors of the study.

##### **1) Structured interviewing questionnaire:** Which included two parts:

**Part (1):** Concerned with general characteristics data such as age, occupation, level of education, years of experience...etc).

**Part (2):** Concerned with knowledge assessment tool was used to evaluate studied nurse's knowledge regarding postpartum infection, causes, source of infection, it contained (46) questions. Each of them was weight according to number of given answer score.

##### **2) Observational checklist**

Observational checklist developed by researcher was used to evaluate the practice of the studied nurses regarding prevention of postpartum infection, it was concerning with following procedures as (hand washing, gloving, gowning, catheter, perineal care, episiotomy care, vaginal examination, insertion of urinary catheter, breast care) was designed by the researcher under guidance of the supervisors and after reviewing the related literature.

#### **Ethical consideration:**

---

Approval from director of Benha university, nurses were assured that data

collected had confidentiality and used only for research. Each study subject was free to withdraw at any time of data collection

Content validity was tested by a panel of three experts specialized in maternity health nursing. The questionnaire was modified according to the panel's judgment.

**Content Validity:**

**Results**

**Table (1):** Numbers& Percentages distribution of general characteristics of nurses (n=50).

| Variable                                                                 | No          | %     |
|--------------------------------------------------------------------------|-------------|-------|
| <b>Age in years</b>                                                      |             |       |
| 20-25                                                                    | 9           | 18.0  |
| 26-30                                                                    | 13          | 26.0  |
| 31-40                                                                    | 14          | 28.0  |
| >40                                                                      | 14          | 28.0  |
| <b>Mean ±SD</b>                                                          | 34.10±13.98 |       |
| <b>Educational qualification</b>                                         |             |       |
| secondary Nursing education                                              | 28          | 56.0  |
| Technical Institute education                                            | 16          | 32.0  |
| Bachelor of Nursing                                                      | 6           | 12.0  |
| <b>Years of experience</b>                                               |             |       |
| One year                                                                 | 2           | 4.0   |
| 2-5                                                                      | 13          | 26.0  |
| 6-10                                                                     | 7           | 14.0  |
| >10                                                                      | 28          | 56.0  |
| <b>Mean ±SD</b>                                                          | 9.21±9.39   |       |
| <b>Training course on the prevention of infection after giving birth</b> |             |       |
| No                                                                       | 40          | 80.0  |
| Yes                                                                      | 10          | 20.0  |
| <b>Number of training course</b>                                         |             |       |
| 1                                                                        | 10          | 100.0 |

Table (1) shows, the mean age of the studied nurses 34.10±13.98 years. 56.0% of them had a secondary nursing education and had more than 10 years of experience. In addition, only 10.0% of them had a training courses regarding the prevention of post partum infection.

## Nurse's Skills Regarding Prevention of Postpartum Infection

**Table (2):** Frequency distribution of nurses under the study regarding to their knowledge about postpartum infection(n=50).

|                                                    | Don't know |      | Incomplete answer |      | Complete answer |      |
|----------------------------------------------------|------------|------|-------------------|------|-----------------|------|
|                                                    | No         | %    | No                | %    | No              | %    |
| <b>Knowledge about general infection</b>           |            |      |                   |      |                 |      |
| <b>Concept of infection</b>                        | 0          | 0    | 16                | 32.0 | 34              | 68.0 |
| <b>Modes of transmission of infection</b>          | 0          | 0    | 16                | 32.0 | 34              | 68.0 |
| <b>General causes of infection</b>                 | 0          | 0    | 17                | 34.0 | 33              | 66.0 |
| <b>Preventive measures of general infection</b>    | 0          | 0    | 13                | 26.0 | 37              | 74.0 |
| <b>Knowledge about postpartum infection</b>        |            |      |                   |      |                 |      |
| <b>Causative agent of postpartum infection</b>     | 0          | 0    | 10                | 20.0 | 40              | 80.0 |
| <b>Causes of postpartum infection</b>              | 20         | 40.0 | 19                | 38.0 | 11              | 22.0 |
| <b>Signs of postpartum infection</b>               | 0          | 0    | 16                | 32.0 | 34              | 68.0 |
| <b>Risk factors of postpartum infection</b>        | 0          | 0    | 15                | 30.0 | 35              | 70.0 |
| <b>Preventive measures of postpartum infection</b> | 1          | 2.0  | 19                | 38.0 | 30              | 60.0 |

Table (2) illustrates that 80.0% of them had a complete knowledge about causative agent of postpartum infection, 70.0% of them had a complete knowledge about risk factors of postpartum infection. On the other hand, 40.0% of them were don't know the causes of postpartum infection

**Table (3):** Frequency distribution of the studied nurses regarding to their practice for prevention and control of postpartum infection during labor (n=50).

| Procedure                            | Good<br>≥75% |      | Satisfactory done<br>60-<75% |      | Unsatisfactory done<br>< 60% |       |
|--------------------------------------|--------------|------|------------------------------|------|------------------------------|-------|
|                                      | No           | %    | No                           | %    | No                           | %     |
| <b>Hand hygiene</b>                  | 12           | 24.0 | 20                           | 40.0 | 18                           | 36.0  |
| <b>Gloving</b>                       | 8            | 16.0 | 18                           | 36.0 | 24                           | 48.0  |
| <b>Gowning</b>                       | 8            | 16.0 | 12                           | 24.0 | 30                           | 60.0  |
| <b>Masking</b>                       | 16           | 32.0 | 10                           | 20.0 | 24                           | 48.0  |
| <b>Perineal care</b>                 | 10           | 20.0 | 20                           | 40.0 | 20                           | 40.0  |
| <b>Vaginal examination</b>           | 0            | 0    | 0                            | 0    | 50                           | 100.0 |
| <b>Insertion of urinary catheter</b> | 0            | 0    | 5                            | 10.0 | 45                           | 90.0  |
| <b>Total practice score</b>          | 8            | 16.0 | 12                           | 24.0 | 30                           | 60.0  |

Table (3) indicates that 90.0% of them had unsatisfactory practice regarding insertion of uterine catheter procedure, 64.0% of them had a satisfactory practice regarding hand washing procedure.

**Table (4):** Frequency distribution of the studied nurses regarding to their practice for prevention and control of postpartum infection at postpartum unit (n=50).

| Procedure                     | Good<br>≥75% |      | Satisfactory done<br>60-<75% |      | Unsatisfactory<br>done<br>< 60% |      |
|-------------------------------|--------------|------|------------------------------|------|---------------------------------|------|
|                               | No           | %    | No                           | %    | No                              | %    |
| Hand Washing                  | 12           | 24.0 | 20                           | 40.0 | 18                              | 36.0 |
| Gloving                       | 8            | 16.0 | 18                           | 36.0 | 24                              | 48.0 |
| Perineal care                 | 10           | 20.0 | 20                           | 40.0 | 20                              | 40.0 |
| Episiotomy care               | 10           | 20.0 | 20                           | 40.0 | 20                              | 40.0 |
| Lochia assessment             | 10           | 20.0 | 20                           | 40.0 | 20                              | 40.0 |
| Breast care                   | 8            | 16.0 | 15                           | 30.0 | 27                              | 54.0 |
| Insertion of urinary catheter | 0            | 0    | 5                            | 10.0 | 45                              | 90.0 |
| <b>Total practice score</b>   | 6            | 12.0 | 12                           | 24.0 | 32                              | 64.0 |

Table (4) Illustrated that 90.0% of them had unsatisfactory practice regarding insertion of uterine catheter procedure, 60.0% of them had a satisfactory practice regarding perineal care and lochia assessment procedure.

**Table (5):** Frequency distribution of the studied nurses regarding to their total knowledge score in relation to their general characteristics (n=50).

| Items                                                                    | Fair |   | average<br>N=8 |      | Good<br>N=42 |      | X <sup>2</sup> | P value |
|--------------------------------------------------------------------------|------|---|----------------|------|--------------|------|----------------|---------|
|                                                                          | No   | % | No             | %    | No           | %    |                |         |
| <b>Age in years</b>                                                      |      |   |                |      |              |      | 4.66           | >0.05   |
| 20-25                                                                    | 0    | 0 | 0              | 0    | 9            | 21.4 |                |         |
| 26-30                                                                    | 0    | 0 | 3              | 37.5 | 10           | 23.8 |                |         |
| 31-40                                                                    | 0    | 0 | 1              | 12.5 | 13           | 31.0 |                |         |
| >40                                                                      | 0    | 0 | 4              | 50.0 | 10           | 23.8 |                |         |
| <b>Educational qualification</b>                                         |      |   |                |      |              |      | 4.73           | <0.05*  |
| secondary Nursing education                                              | 0    | 0 | 7              | 87.5 | 21           | 50.0 |                |         |
| Nursing technician Institute                                             | 0    | 0 | 0              | 0    | 16           | 38.1 |                |         |
| Bachelor of Nursing                                                      | 0    | 0 | 1              | 12.5 | 5            | 11.9 |                |         |
| <b>Years of experience</b>                                               |      |   |                |      |              |      | 0.742          | >0.05   |
| One year                                                                 |      |   | 0              | 0    | 2            | 4.8  |                |         |
| 2-5                                                                      | 0    | 0 | 2              | 25.0 | 11           | 26.2 |                |         |
| 6-10                                                                     | 0    | 0 | 1              | 12.5 | 6            | 14.3 |                |         |
| >10                                                                      | 0    | 0 | 5              | 62.5 | 23           | 54.8 |                |         |
| <b>Training course on the prevention of infection after giving birth</b> |      |   |                |      |              |      | 1.33           | >0.05   |
| No                                                                       | 0    | 0 | 5              | 62.5 | 34           | 81.0 |                |         |
| Yes                                                                      | 0    | 0 | 3              | 37.5 | 8            | 19.0 |                |         |

(\*) statistical significant difference at level (<0.05)

Table (5) shows distribution of nurses' total knowledge score in relation to their personnel characteristics. It reveals that there was a statistical significant difference between nurse's total

## Nurse's Skills Regarding Prevention of Postpartum Infection

knowledge score and their educational qualification ( $p < 0.05$ ). While there was no statistical significant difference between total knowledge and their age, years of experience, and training courses ( $p > 0.05$ ).

**Table (6):** Frequency distribution of nurses' total practice score regarding postpartum infection in relation to their personnel characteristics. (n=50).

| Items                                                                    | Good<br>N=13 |      | Satisfactory<br>N=15 |      | Unsatisfactory<br>N=22 |      | X <sup>2</sup> | P value |
|--------------------------------------------------------------------------|--------------|------|----------------------|------|------------------------|------|----------------|---------|
|                                                                          | No           | %    | No                   | %    | No                     | %    |                |         |
| <b>Age in years</b>                                                      |              |      |                      |      |                        |      | 1.88           | >0.05   |
| 20-25                                                                    | 3            | 23.1 | 3                    | 20.0 | 3                      | 13.6 |                |         |
| 26-30                                                                    | 2            | 15.4 | 5                    | 33.3 | 6                      | 27.3 |                |         |
| 31-40                                                                    | 4            | 30.8 | 4                    | 26.7 | 6                      | 27.3 |                |         |
| >40                                                                      | 4            | 30.8 | 3                    | 20.0 | 7                      | 31.8 |                |         |
| <b>Educational qualification</b>                                         |              |      |                      |      |                        |      | 2.77           | >0.05   |
| Secondary Nursing education                                              | 6            | 46.2 | 8                    | 53.3 | 14                     | 63.6 |                |         |
| Nursing technician Institute                                             | 4            | 30.8 | 6                    | 40.0 | 6                      | 27.3 |                |         |
| Bachelor of Nursing                                                      | 3            | 23.1 | 1                    | 6.7  | 2                      | 9.1  |                |         |
| <b>Years of experience</b>                                               |              |      |                      |      |                        |      | 3.75           | >0.05   |
| One year                                                                 | 1            | 7.7  | 1                    | 6.7  | 0                      | 0    |                |         |
| 2-5                                                                      | 2            | 15.4 | 4                    | 26.7 | 7                      | 31.8 |                |         |
| 6-10                                                                     | 3            | 23.1 | 2                    | 13.3 | 2                      | 9.1  |                |         |
| >10                                                                      | 7            | 53.8 | 8                    | 53.3 | 13                     | 59.1 |                |         |
| <b>Training course on the prevention of infection after giving birth</b> |              |      |                      |      |                        |      | 0.723          | >0.05   |
| No                                                                       | 11           | 84.6 | 12                   | 80.0 | 16                     | 72.7 |                |         |
| Yes                                                                      | 2            | 15.4 | 3                    | 20.0 | 6                      | 27.3 |                |         |

Table (6) reveals distribution of nurses' total practice score in relation to their personnel characteristics. It reveals that there was no statistical significant difference between total practice score and their age, educational qualification, years of experience, and training courses ( $p > 0.05$ ).

### Discussion

Regarding socio-demographic data the present result showed that mean age  $\pm$  SD of studied nurses was (34,10  $\pm$  13,98) years old and more than half of them aged above 30 years. These findings came in accordance with (Devi & Tamang, 2014) and found the age of the majority of studied nurses was between (31-40) years old. This may be due to the hierarchal pyramidal system of the obstetric and gynecological department based on wide base of nurses have this age.

In addition, studied nurses educational qualification the present study illustrated that

more than half (56%) of the studied nurses had secondary nursing education that they graduated since long time and majority of them didn't attend continuous in-service educational training p courses. These findings agreed with (Kaur, Kaur, Saha., 2014) who assessed skill development of nurses in managing the fourth stage of labour and found that more than half (60%) of studied nurses were graduated in diploma nursing. In addition, (Abdalla & Salah, 2015) who assessed effectiveness of infection control standers on practice among healthcare personnel working in MCH centers at Quahah governorate, and indicated that majority of the studied nurses more than two

third (74%) had secondary nursing diploma education.

Regarding nurses knowledge about postpartum infection, The present study illustrated that more than two third (70%) of studied nurses had good knowledge about risk factor of postpartum infection. These results agreed with (Marie, 2010) who assessed knowledge of nurse-midwives while providing midwifery services in twelve different health facilities in Bangladesh and who found that two third of studied nurses (68,8%) had good knowledge about risk factors of postpartum infection.

In addition, the present study illustrated that more than two third (68%) of studied nurses had good knowledge about signs of postpartum infection. These results came in accordance with (Harper, 2011) who emphasized that midwives involved in maternity care have a duty to be aware of early signs of infection during postpartum period as (offensive vaginal discharges, vaginal bleeding, fever).

Moreover, the present study pointed out that the majority (80%) of studied nurses had complete knowledge about causative agent of postpartum infection. These results agreed with (Momoh et al., 2010) who aimed at identifying the causes and management of puerperal sepsis from the health personnel's view point of Nnamdi Azikiwe University Teaching Hospital Nnewi then found that the majority of studied nurses had good knowledge regarding different causative agents of postpartum infection.

In relation, total practice score of the studied nurses regarding postpartum care the present study showed that less than half (44%) of studied nurses had unsatisfactory practice regarding prevention of postpartum infection. These results were consistent with (Mahmoud, 2015) who assessed level of quality of immediate postpartum nursing practice that provided to mothers after birth,

and revealed that there were low for most nursing procedures. The finding of the present study mentioned that two third (64%) of studied nurses had a satisfactory practice regarding hand washing procedure. In addition, (Kowitt et al., 2013) who assessed factors associated with hand washing compliance at tertiary teaching hospitals, and founded nurses were the health care workers with the highest compliance rate of hand washing. on other hand those result not agreed with (Yaswon & Hesse, 2013) who reported that hand hygiene compliance among nurses and doctors is low. This is may be due to nurses practice hand washing as a daily routine care.

In addition, nurses practice regarding vaginal examination the present study showed that (100%) of studied nurses had unsatisfactory practice regarding vaginal examination procedure. Those finding in the same line with (Abed El-menem, 2007) who assessed infection control measures practiced by nurses in labor and delivery unit in Benha University Hospital, who mentioned that all nurses have in correct practice during vaginal examination procedures. Concerning nurses practice related episiotomy care & perineal care of the women the present study showed that more than half (60% & 60%) respectively had satisfactory practice regarding episiotomy care and perineal care, those finding supported by (Hedayati et al., 2010) who stated that following birth, many women will experience some pain, swelling or tenderness in the perineum due to perineal trauma such as tear or episiotomy. Where trauma has occurred, nurses midwives should check the perineum and assess the healing regularly until they are sure that full healing has occurred. In addition, (Fekry, 2008) who showed that (57%) of the studied nurses did perineal care incompletely.

Concerning the relation of studied nurses total knowledge regarding postpartum infection and their personnel characteristics, the present study showed that there was a

statistical significant difference between nurses total knowledge score and their educational qualification. Those findings supported by (Abd El Fattah & Zein El Dien, 2012) who assessed quality of nursing care provided immediately after birth at university hospital in Shebin El-kom and added that there was a significance relationship between nurses education and their knowledge.

As regarding the relation of studied nurses total practice and their personnel characteristics, the present study revealed that there was no statistical significant difference between total practice and their age, educational qualification, years of experience and training courses. Those finding supported by (Fashafesh, 2015), who assessed knowledge and practice of nursing staff toward infection control measures in governmental hospital in Palestine and found that, there was no statistical significant difference between mean practice score toward age, years of experience and training courses. This is may be due to that practice as a skill highly correlated with environmental preparation, that allow all nurses to behave in the manner.

### **Conclusion**

---

The majority of the studied nurses had a good level of knowledge regarding prevention of postpartum infection, on the other hand less than half of them had un satisfactory practice concerning postpartum infection control measures. There was a statistical significant difference between studied nurses total knowledge and their educational qualification. There was significant negative correlation between studied nurse's total practice and their personnel characteristics.

### **Recommendation**

---

In the light of the present study findings, the following recommendations are suggested:

- \* Periodic in-service educational courses for nurses regarding their needs of preventive measures of infection.
- \* Provide nurses with simple illustrated posters and booklet regarding the main topics of infection prevention.

### **References**

---

- Abdallah, N. & Salah, A.A., (2015): Effectiveness of infection control standers on practice among health care personnel working in MCH centers at Quena governorate, vol (4), Issue (4), p.61-70. JOSR (Journal of nursing and health science), www.josrgournals.org.
- Abd El Fattah, N. & Zein El Dien, N. (2012): Assessment of quality of nursing care provided immediately after birth at university hospital, life science Journal, 2012; 9(4) 2115-2126 (ISSN: 1097-8153).
- Abed El-Menem, O.S. (2007): Assessment of infection control measures practiced by nurses the labour and delivery unit Master thesis at faculty of nursing, Benha University.
- Bauer, M.E.; Bateman, B.T.; Bauer, S.T., et al. (2013): Maternal sepsis mortality and morbidity during hospitalization for delivery: temporal trends and independent associations for severe sepsis. *Anesth Analg.* 2013 Oct. 117(4):944-50. [Medline].
- Devi, B. and Tamang, R. (2014): Knowledge on practice of aseptic technique during delivery among health professional in selected government hospitals of Sikkim,

- SMU Medical Journal, Vol (1), No (2).  
ISSN: 2349-1604. epidemiology, 34 (11), P.P(1146-1152).  
doi: 10.10861673465.
- Fahafesh, I. (2015): Knowledge and practice of nursing staff towards infection control measures in Palestinian hospital. *Journal of Education and Practice*. Vol (6) No. (4).2015
- Fekry, R.M. (2008): Study on Attitudes of normally laboring women toward the involvement of nursing students in their care, pp (107-108).
- Harper, E. (2011): Sepsis, in centre for maternal and child enquiries (CMACE) saving mother's lives: reviewing maternal deaths to make motherhood safer; the eight report to confidential enquiries into maternal death in United Kingdom. ED.G. Lewis. *Bjog: An international British journal of Obstetrics and Gynecology*: 118-(suppl-1): P.P (85-96).
- Hedayati, H.; Parsons, J. and Growther, C. (2010): Topically applied anesthetics for treatment of perineal pain after birth. *Cochrane library* (2). John Wiley & Sons, Chichester.
- Karsnitz, D.B. (2013): puerperal infection of the genital tract; A clinical review. *Journal of midwifery & women's health*, (58) pp.632-642. doi: 10.1111/jmwh.12119
- Kaur, N.; Kaur, S. and Saha, P.K. (2014): Skill development of nurses in managing the fourth stage of labour. *Nursing and Midwifery Research Journal*, vol (10), No. 1, January 2014.
- Kowitz, B.; Jefferson, J. and Mermel, L. (2013): Factors associated with hand washing compliance at tertiary teaching hospitals. *Infection control and hospital epidemiology*, 34 (11), P.P(1146-1152). doi: 10.10861673465.
- Mahmoud, H.M. (2015): Quality of immediate postpartum nursing care as perceived by nurses in Menoufia Hospital, master thesis, faculty of nursing.
- Marie, Berg (2010): An assessment on skilled birth attendant's knowledge in Bangladesh, saving lives of Mothers and Babies. University of Gothenburg. International confederation of midwives.
- Marshall, J. and Raynor, M. (2014): *Myles' Textbook for midwife*, sixteen ed p. 515 Churchill- Livingstone, Elsevier.
- Momoh, M.; Ezugworie, O. J. & Ezeigwe, H. O. (2010): Causes and management of puerperal sepsis: The health personnel view point. *Advanced in biological research*, 4 (3). pp.154-158. retrieved from march 3,2014, from [http:// www. idosi.org/abr/4\(3\)/2.pdf](http://www.idosi.org/abr/4(3)/2.pdf).
- World Health Organization (WHO), (2011): Practical guidelines for infection control in health care facilities *journal of hospital infection*.pp.7-702.
- World Health Organization (2015): WHO, UNICEF, The World Bank, United Nations Population Division. The Inter-Agency Group for Child Mortality Estimation (UN IGME). Levels and Trends in Child Mortality. Report 2015. New York, USA, UNICEF, 2015.WWW.WHO.INT/GHO/MATERNAL-HEALTH MORTALITY
- Yawson, A., & Hesse, A. (2013): Hand hygiene practice and resources in a teaching hospital in Ghana. *Infection control and hospital epidemiology*. 17;7(4): 338-4s7.