

Compliance to standard precautions among nurses working in Qassim hospitals in KSA

Fathia Ahmed Mersal^{1*}, Lamiaa Ismail Keshk²

¹Associate professor of community health nursing College of Nursing Qassim university

²Assistant professor of Nursing Administration College of Nursing Qassim university

*Corresponding author E-mail: khomarkh@yahoo.com

Abstract

Background: Compliance with standard precautions has been shown to reduce the risk of exposure to blood and body fluids. Nurses represent the largest percentage of the health care workers hence; their compliance with standard precautions guidelines seems to be more crucial in preventing the disease transmission among patients.

Aim: this study aims to evaluate compliance to standard precautions among nurses working in Qassim Hospitals in KSA.

Methodology: A cross sectional study was conducted in 4 multispecialty hospitals of Al-Qassim region, KSA. A purposive sampling approach was adopted whereas sample consisted of 284 male and female nurses working in multispecialty hospitals. Data collected through self-administrative questionnaire which consists of; personal and work characteristics of nurses, nurses' knowledge and compliance of standard precautions.

Results: Nearly half of nurses had poor knowledge regarding standard precautions and the majority of nurses had better compliance to standard precautions. However nearly one third of nurses had good compliance to waste disposal.

Conclusions: Compulsive training courses found to be vital for developing awareness among nurses, improving compliance to standard precautions and good clinical practice.

Recommendations: Further studies are recommended by using different methods for data collection. Written universal precautions guidelines for infection control should be available.

Keywords: Compliance; Nurses; Standard Precautions; Saudi Arabia.

1. Introduction

Standard or universal precautions encompasses wide range of guidelines designed to reduce the risk of nosocomial infection from both known and unexpected sources in the healthcare setting as well as to help prevent health workers from being occupationally infected. The Centers for Disease Control (CDC) has recommended that standard precautions must be consistently used on all patients, regardless of knowledge about their infection status. Hence, nurses' firm adherences comprise an important factor in determining the rate of hospital associated infections [1], [2].

Compliance with these standard precautions has been shown to reduce the risk of exposure to blood and body fluids. The term "standard precautions" is replacing "universal precautions", as it expands the coverage of universal precautions by recognizing that any body fluid may contain contagious and harmful microorganisms [3].

The recommendations of Universal precautions include; hand washing, use of barriers as wearing gloves, gowns and aprons when collecting or handling blood and body fluids contaminated with blood; wearing face shields when there is danger of blood splashing on mucous membranes. Others include adequate discarding of sharp instruments including needles; another essential measure is adequate (HCWs) immunization, as this guarantees anticipated protection against immune-preventable diseases. These recommendations are for doctors, nurses, patients, and health care support workers who are required to come into contact with pa-

tients or body fluids. Finally, it is furthermore recommended that all health care workers receive precautions to prevent injuries caused by needles, scalpels and other sharp instruments or devices [4], [5].

Hospital acquired infections is one of the most important problems in health care services worldwide. It comprises one of the leading causes of morbidity and mortality associated with clinical, diagnostic and therapeutic procedures. These infections affect the quality of medical care and increase medical care costs. More than one million Health care workers are at a high risk of needle stick injuries and blood-borne pathogens as they perform their daily routine work activities in a hospitals [6], [4].

Despite the availability of detailed guidelines and training on universal precautions, the knowledge and compliance with standard precautions vary among HCWs and have been found to be insufficient in both developed and developing countries. Health care workers (HCWs) are at risk of occupational exposure to infection with blood-borne pathogen during their routine work. Worldwide, approximately three million HCWs experience percutaneous exposure to blood-borne pathogens each year. Various exposures can be prevented through careful compliance to universal precaution [7].

Nurses represent the largest percentage of the health care workers and they are the "core of the health care system". Because they spend more time with patients than any other HCWs, their compliance with Standard Precautions guidelines seems to be more crucial in preventing the disease transmission among patients [8].

Nurses are potentially exposed to various infections during their clinical practice, they are exposed to blood borne infections by pathogens, such as Human Immunodeficiency Virus (HIV), hepatitis B and hepatitis C Viruses, from sharps injuries and contacts with deep body fluids. Nursing staff have a huge responsibility to protect themselves, their families, and their patients from danger because they work in an environment that encourages infections, and (HCWs) are always facing new dangers from untreatable infections. Therefore, nurses' compliance with standard precautions of infection control guidelines and preventive measures has been recognized as being an efficient means to prevent and control the transmission of infectious pathogens [9].

2. Aim of the study

The study aims at evaluating compliance to standard precautions among nurses working in Qassim Hospitals in KSA through the followings:

- Determine the nurses' self-reported knowledge with regards to standard precautions.
- Explore nurses' self-reported compliance to standard precautions.

3. Research Questions

Are nurses working in Qassim hospitals comply with standard precautions ?

Are nurses working in Qassim hospitals knowledgeable about standard precautions?

4. Subject and methods

4.1. Study design

A cross sectional descriptive study was conducted in 4 multi-specialty hospitals of Al-Qassim region, Saudi Arabia.

4.2. Study setting

The data has been collected from 4 hospitals affiliated to ministry of health in Al-Qassim region, first; King Fahd Hospital, Second King Saud Hospital, third; Central Buridah hospital, forth; Prince Sultan Hospital. These hospitals serve the major proportion of Qassim population owing to their multispecialty and provision of improved clinical services as per international standards.

4.3. Study sample

The purposive sampling approach was adopted whereas sample consisted of 284 male and female nurses working in the previously mentioned settings for at least one year continuously with full time employment. The generated sample size was adequately powered to achieve 80 % power with a medium effect and an alpha of 0.05 the required sample size was 250 participants. We invite 450 nurses who agreed to participate, 284 of them completed the questionnaires.

4.4. Tools of data collection

For data collection a self-administrative questionnaire were used to assess:

- Nurses' personal characteristics as regards their age, marital status, gender, educational level and nationality.
- Work characteristics as regards departments, past experience, previous training, and work place.
- Nurses' Knowledge of Standard Precautions; it was developed by the researchers in English language based on recent literature and it consists of 22 items. The score one was given for each correct answer and zero for incorrect answer. The total knowledge considered good if the percent score reached 75% or more, average from 60% to 74.9% and poor from less than 60%.
- Compliance with Standard Precautions Scale. It was adopted with approval from Lam [10], it consists of 20-item included areas related to the use of personal protective equipments, disposal of sharp instruments and waste, decontamination of spills and used articles, and prevention of cross infection. The response set was a 4-point Likert scale, which consisted of replies such as "never," "seldom," "sometimes," and "always. Most of the items were positively worded statements, except for questions C2, C4, C6, and C15. Given that healthcare workers were required to comply fully with local standard precautions' guidelines, only the "always" option in positively worded statements and the "never" option in negatively worded statements were given a score of 1. The other options were not given any scores. The total scores ranged from 0 to 20, and a higher score indicated a better compliance with standard precautions.

4.5. Data collection and analysis

Data were collected in February 2016 to May 2016 by self-administered questionnaire. The questionnaire was distributed to the participants by the authors and research assistants. Data were coded and statistically analyzed using SPSS version 16. Descriptive analysis was conducted whereas all qualitative variables were described as numbers and percentages while quantitative variables as mean \pm standard deviation (SD). The percent total knowledge score was calculated.

4.6. Ethical consideration

Ethical Approval from Local Research Ethics Committee of Qassim Province was obtained and then approval from hospitals administration. Furthermore, verbal consent was obtained from the respondents prior to participation in the study with brief explanation on the objectives and benefits of the study with emphasis that personal data would be confidential and used for the scientific work only.

5. Results

Table (1) shows that the mean age of the studied sample was 30.03 ± 5.11 years, more than half of the studied sample (54.6%) were single, the majority (97.2%) of nurses were females, and in relation to the educational level; most (80.3%) of them had bachelor degree in Nursing. Regarding nationality more than half (53.3%) of them were Indian.

Table (2) explains that (60%) of nurses working in medical surgical departments, (39.4%) of them had 5 to 10 years past experience and (87%) of them attended training program related to infection control. Regarding working place nearly one third (31.7%) working in King Saud Hospital.

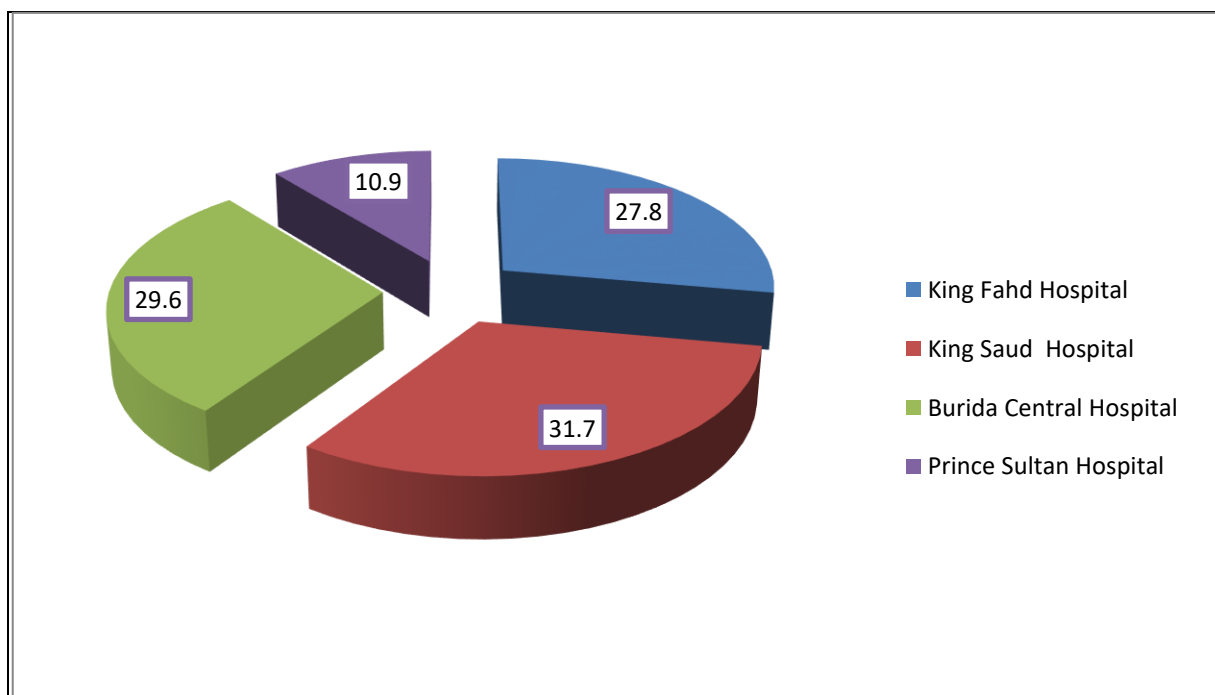
Table 1: Assessment of Personal Characteristics of the Studied Sample

Parameter	No = 284	%
Mean of Age (years):	30.03 \pm 5.11	
Age		
<25	11	3.9
25-	152	53.5
30-	72	25.4
35-	24	8.5

≥40	25	8.8
Marital status		
Single	155	54.6
Married	129	45.4
Gender		
Female	276	97.2
Male	8	2.8
Educational level		
Diploma nurse	51	18
Bachelor degree	228	80.3
Master degree	5	1.8
Nationality		
Indian	151	53.3
Filipino	105	37
Saudi	24	8.5
Other	4	1.4

Table 2: Assessment of Work Characteristics of the Studied Sample

Parameter	No = 284	%
Department		
emergency	41	14.4
pediatric	9	3.2
Maternity	20	7
Medical surgical	173	60
Critical care	36	12.7
ambulatory	5	1.8
Past Experience		
<5	106	37.3
5-	112	39.4
≥10	66	23.2
Mean of past experience (years):	6.86±4.28	
Previous training		
Yes	247	87
No	37	13
Work place		
King Fahd Hospital	79	27.8
King Saud Hospital	90	31.7
Burida Central Hospital	84	29.6
Prince Sultan Hospital	31	10.9

**Fig. 1:** Percent Distribution of Workplaces of the Studied Sample.

Regarding working places figure one shows that nearly one third (31.7%) working in King Saud Hospital and (29.6%) working in Burida Central hospital.

Table 3: Assessment of Standard Precautions Knowledge of the Studied Sample

Parameter	No = 284	%
Good	111	39.1
Average	50	17.6
poor	123	43.3
Total mean of knowledge	13.68±4.64	

Regarding standard precautions knowledge table 3 illustrates that nearly half (43.3%) of nurses had poor knowledge regarding standard precautions. Whereas the mean of total knowledge was 13.68 ± 4.64 .

Table 4: Assessment of Compliance with Standard Precautions among Studied Samples

Parameter	No = 284	%
Use of protective device		
C7: I remove PPE in a designated area	241	84.9
C10: I wear gloves when I am exposed to body fluids, blood products, and any excretion of patients	276	97.2
C13: I wear a surgical mask alone or in combination with goggles, face shield, and apron whenever there is a possibility of a splash or splatter	219	77.1
C14: My mouth and nose are covered when I wear a mask	256	90.1
C15: I reuse mask or disposable PPE	61	21.5
C16: I wear a gown or apron when exposed to blood, body fluids, or any patient excretions	239	84.2
Disposal of sharps		
C4: I recap used needles after giving an injection	53	18.7
C5: I put used sharp articles into sharps boxes	257	90.5
C6: The sharps box is only disposed when it is full	94	33.1
Disposal of waste		
C17: Waste contaminated with blood, body fluids, secretion, and excretion are placed in red plastic bags irrespective of patient's infective status	106	37.3
Decontamination of spills and used articles		
C18: I decontaminate surfaces and equipment after use	87.50	16
C19: I wear gloves to decontaminate used equipment with visible soils	264	93
C20: I clean up spillage of blood or other body fluid immediately with disinfectants	245	86.3
Prevention of cross infection from person to person		
C1: I wash my hands between each patient contact	266	93.7
C2: I only use water for hand washing	118	41.5
C3: I use alcoholic hand rubs as an alternative if my hands are not visibly soiled	222	78.2
C8: I take a shower in case of extensive splashing even after I have put on PPE	183	64.4
C9: I cover my wound(s) or lesion(s) with waterproof dressing before patient contacts	263	92.6
C11: I change gloves between each patient contact	269	94.7
C12: I decontaminate my hands immediately after removal of gloves	267	94

Regarding compliance with standard precautions table 4 illustrates that majority of nurses had good compliance of wearing gloves, covering their mouth and nose when wearing mask while minority (21.5%) of them reused disposable mask. Regarding disposal of sharps the majority of nurses put used sharp articles into sharps boxes while nearly one third (33.1 %) of them disposing the sharps box only when it is full. Additionally, (18.7%) recapping used needles after giving an injection. Only (37.3%) of nurses had good compliance to waste disposal whereas the majority of them had good compliance to decontamination of spills and used articles. Regarding prevention of spreading infection the majority of nurses had better compliance to hand washing and changing gloves between each patient contact, covering their wounds before patient contact and decontaminate their hands immediately after removal of gloves. Moreover (64.4%) of nurses take a shower in case of extensive splashing and (78.2%) of them use alcoholic hand rubs as an alternative while (41.5%) of them use water for hand washing.

6. Discussion

It is very important to ensure the provision of high quality medical care and security by the prevention and control of hospital infections. Nurses play a vital role in the prevention and control of hospital infections because they responsible on a high proportion of the treatment and care of patients. The standard precautions has been documented as an efficient and effective means in the control of hospital infections [6]. Hence, this study aimed to assess the nurses level of compliance with universal precautions of infection control.

Pertaining to nurses' characteristics our findings revealed that the majority of nurses were female and had bachelor degree in nursing sciences. More than one third of nurses their experience more than 5 years. Similarly Fayed et al [11] examine the effect of instructional program on nurses compliance with universal precautions of infection control in neonatal intensive care units. They found that more than half of nurses had bachelor degree and had more compliance to universal precautions comparing to nurses who had diploma. Therefore continuing education regardless of age can significantly enhance compliance to universal precautions and

reduces rates of infection. Additionally, Adly et al [1] conduct a quasi-experimental study to improve nurses' compliance with standard precautions of infection control in pediatric critical care units. They reported that years of experience in the emergency departments had a major effect on the nurses' knowledge and practices which consequently enhance nurses' compliance to universal precautions.

It is vital that health care workers especially nurses have good knowledge about the risk of blood-borne pathogens at work place and about the preventive measures for reducing risk. Unfortunately regarding knowledge of universal precautions our results showed that nearly half of nurses had poor knowledge.

A research conducted by Chaudhuri et al [12] in a tertiary health care centre in Manipur evaluated the knowledge and attitudes of standard precautions among nursing staff, and showed that almost nine in ten of the participants were aware of universal precaution. But regarding details, only few of nurses had complete knowledge.

Another study conducted by Fayaz et al [13] who assess knowledge and practice of universal precautions among health care workers in four national hospitals in Kabul, Afghanistan. They concluded that The HCWs in Kabul had insufficient knowledge of and poor practice in applying universal precautions. Furthermore, the finding is also in agreement with Abubakar et al [14] who assess knowledge and practice of standard precautions among nurses working at Federal Medical Centre Nigeria. They reported that minority of nurses had good knowledge related to components of standard precautions.

In contrast a study done by Bolaji-Osagie et al [15] to assess the knowledge and practice of universal precautions amongst midwives in Central Hospital, Benin City, who stated that knowledge of universal precautions amongst midwives is significantly high.

Our findings revealed that the majority of nurses had better compliance to standard precautions. This is may be related to hospital regulations and repeated education. Additionally, the majority of nurses had better compliance to hand washing and changing gloves between each patient contact. The results obtained were similar to those found in the study of Taze and Cavdar [16] among surgical nurses who confirmed that nearly 99 % of the nurses certainly washed their hands if they were contaminated with blood or

body fluids regardless the diagnosis. Whereas hand washing represents the most important methods of preventing infections. As well as the results of investigations by Punia et al [6] on perceptions and determinants of compliance among health care workers in the emergency and trauma triage of a tertiary care hospital in South India. Who stated that the majority of HCWs confirmed use of hand rub (74.7%) following most procedures. Compliance with glove use was declared by 85.1%.

Additionally, our findings revealed that the majority of nurses had better compliance regarding recapping used needles after giving an injection. Nearly one third of nurses had good compliance to waste disposal.

In a recent study conducted by Pereira et al [17] to evaluate the differences of compliance with SP among nurses from Brazil and Hong Kong. They reported that Brazilian nurses had significantly better compliance regarding recapping used needles after giving an injection and waste disposal comparing to Hong Kong nurses.

In contrast Luo et al [7] who assess registered nurse compliance with standard precautions, they reported that compliance with the standard precautions is low in nurses. Moreover the use of protective items such as eye shields, masks, and quarantine clothes had the lowest compliance while hand washing, sterilization and the disposal of sharp instruments were relatively higher compliance.

The reproduction of the Compliance with Standard Precautions Scale was approved (approval code B500N24-201509)

7. Conclusions

Nearly half of nurses had poor knowledge regarding standard precautions and the majority of nurses had better compliance to standard precautions. However nearly one third of nurses had good compliance to waste disposal. Therefore, compulsive training courses emerged was found to be vital for developing awareness among nurses, as well as improving compliance to standard precautions and good clinical practice. Hence hospital authorities and hospital infection control department should pay more attention to nurse compliance with standard precautions.

8. Recommendations

Further studies are recommended by using different methods for data collection. Written universal precautions guidelines for infection control should be available and updated periodically. Obligatory seminars/workshops on standard precautions should be continuously structured by hospital managers to increase awareness and practice of HCWs especially nurses. The findings of this study can be used by nurses, hospital managers, policymakers, risk managers, and nurse educators as a means of enhance compliance of standard precautions among nursing personnel.

Acknowledgements

The researchers appreciatively acknowledge the financial support of Qassim University. Additionally, the researchers would like to acknowledge the valuable help of associate professor Simon C. Lam for CSPS reproduction approval. They would also like to thank those nurses who kindly participated in the study.

Conflict of interest

The authors declare that they have no Conflict of Interest

References

- [1] Adly R. M., Amin F.M. and Abd El Aziz M.A.(2014): Improving Nurses' Compliance with Standard Precautions of Infection Control in Pediatric Critical Care Units, World Journal of Nursing Sciences 3S: 01-09, 2014, DOI: 10.5829/idosi.wjns.2014.3S.95159.
- [2] Mollaoglu M, Mollaoglu M, Şanal L (2015) Compliance with Standard Precautions of Students in Clinical Practice. J Family Med Community Health 2(8): 1064.
- [3] Amoran, O., &Onwube, O. (2013). Infection Control and Practice of Standard Precautions among Healthcare Workers in Northern Nigeria. Journal of Global Infectious Diseases, 5(4), 156–163. <https://doi.org/10.4103/0974-777X.122010>.
- [4] Vaz K, McGrowder D, Alexander-Lindo R, Gordon L, Brown P, Irving R (2010): Knowledge, Awareness and Compliance with Universal Precautions among Health Care Workers at the University Hospitals of the West Indies, Jamaica. International Journal of Occupational and Environmental Medicine, 1(4): 171-181.
- [5] Paul B., Pawar A., Kumar D., Sujesh P.K. (2014): A Study on Knowledge, Attitude and Practice of Universal Precautions among Medical and Nursing Students, Sch. J. App. Med. Sci., 2014; 2(5E):1821-1823
- [6] Luo Y, He GP, Zhou JW, Luo Y. Factors impacting compliance with standard precautions in nursing, China. Int J Infect Dis 2010; 14:e1106-14. <https://doi.org/10.1016/j.ijid.2009.03.037>.
- [7] Punia S., Nair S., and Shetty R. S., "Health Care Workers and Standard Precautions: Perceptions and Determinants of Compliance in the Emergency and Trauma Triage of a Tertiary Care Hospital in South India," International Scholarly Research Notices, vol. 2014, 5 pages, 2014. <https://doi.org/10.1155/2014/685072>.
- [8] Shinde M. B, Mohite V. R (2014). A Study to Assess Knowledge, Attitude and Practices of Five Moments of Hand Hygiene among Nursing Staff and Students at a Tertiary Care Hospitals at Karad, International Journal of Science and Research, Volume 3 Issue 2, 311-321.
- [9] Baniyousef A.M., Mehlab E. M., Al Sobhi H. and Hussain K. (2015): Attitudes, Knowledge, and Sources of Information among Nursing Staff toward Standard Precautions and Infection Control at King Abdulaziz Tertiary Hospital- Makkah, International Journal of Research in Applied, Natural and Social Sciences Vol. 3, Issue 3, Mar 2015, 45-60
- [10] Lam, S.C., Fung, E.S.S., Hon, L.K.Y., Ip, M.P.Y., Chan, J.H.T., 2010. Nursing students' compliance with universal precautions in Hong Kong. Journal of Clinical Nursing 19, 3247–3250. <https://doi.org/10.1111/j.1365-2702.2010.03419.x>.
- [11] Fayed N. M., Elbahnasawy H. T., and Omar T. K.(2016): Effect of Instructional Program on Nurses Compliance with Universal Precautions of Infection Control, International Journal of Novel Research in Healthcare and Nursing Vol. 3, Issue 1, pp: (81-92).
- [12] Chaudhuri, S., Baidya, O. P. & Singh, T. G. (2016) Knowledge and attitude of universal precaution among nursing staff in a tertiary hospital of Manipur. International Journal of Community Medicine and Public Health, 3 (2), 451-454. <https://doi.org/10.18203/2394-6040.ijcmph20160430>.
- [13] Fayaz SH, Higuchi M, Hirosawa T, Sarker MA, Djabbarova Z, Hamajima N. Knowledge and practice of universal precautions among health care workers in four national hospitals in Kabul, Afghanistan. J Infect Dev Ctries. 2014 Apr 15;8(4):535-42. <https://doi.org/10.3855/jidc.4143>.
- [14] Abubakar S.M., Haruna H., Teryila K.R., Hamina D., Ahmadu I., Babaji M. and Bulama K.U. Assessment of knowledge and practice of standard precautions among nurses working at Federal Medical Centre Gombe, Nigeria, Direct Research Journal of Health and Pharmacology (DRJHP) Vol.3 (1), pp. 1-11, March, 2015
- [15] Bolaji-Osagie, S.O., Adeyemo, F.O., &Onasoga, O.A. (2015). The knowledge and practice of universal precautions amongst midwives in Central Hospital, Benin City. Journal of Public Health and Epidemiology, 7(11), 331-336. <https://doi.org/10.5897/JPHE2015.0732>.
- [16] Taze S. S. and Cavdar I. (2016): Universal Precautions that Surgical Nurses are taken for Preventing from Diseases Transmitted by Blood and Body Fluids in Istanbul, International Journal of Caring Sciences January – April 2016 Volume 9 | Issue 1| Page 111-121
- [17] Pereira FM, Lam SC, Chan JH, Malaguti-Toffano SE, Gir E. (2015): Difference in compliance with Standard Precautions by nursing staff in Brazil versus Hong Kong, American Journal of Infection Control 43 (2015) 769-72. <https://doi.org/10.1016/j.ajic.2015.03.021>.

[1] Adly R. M., Amin F.M. and Abd El Aziz M.A.(2014): Improving Nurses' Compliance with Standard Precautions of Infection Control