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Assessment of Compliance of Medical Interns toward Personal Protective Equipment at King Abdul-Aziz University-Saudi Arabia

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Abstract: ***Few studies exist concerning the assessment of medical intern's perspectives' towards Personnel protective equipment's. The purpose of this article was to assess the medical intern's compliance' towards Personnel protective equipment's at King Abdul-Aziz University-Saudi Arabia. Methods: A descriptive research design was utilized in the current research. A total of 200 medical interns of King Abdul-Aziz University of Medicine were given a structured questionnaire one week before graduation during the internship for the academic year 2015-2016. They were asked to indicate their perspectives towards personnel protective equipments required to safely implementation of clinical procedures. For each item concerning the (PPE), the proportion of intern's perspectives towards the protective equipments was calculated. Descriptive statistics like percentage was used to describe the findings using SPSS 20. Results: The current research study objectives were to evaluate self-reported compliance with personal protective equipment (PPE) use among the medical interns at King Abdul-Aziz University. A total of 200 medical students, from King Abdul Aziz University, were surveyed using a confidential questionnaire. The results indicated that compliance with PPE varied considerably. Compliance was high for gowns and protective eyewear (93.0) & (92.5%) respectively, but compliance level was low for wearing masks (86.5).While presentable number of participants showed non compliance for protective Gowns (6.0%). Conclusions: The findings of the current research are revealed Compliance was high for gowns and protective eyewear. Although, it considers to be worrisome, because considerable number of medical interns' compliance level towards the personnel protective equipments showed low level of adherence in relation to some of the elements of personnel protective equipments, especially in relation to wearing mask. While presentable number of participants showed non compliance for protective Gowns, which was expected to report (100 %) as a standardized level of compliance. More accents on universal precautions during undergraduate and interns' medical education are required.***

Keywords: Compliance, Personal Protective Equipment, Universal Precaution

1. Introduction

Personnel Protective Equipments are set of measures utilized to prevent the transmission of blood borne pathogens and other pathogens from recognized and unrecognized sources when providing health care services. Health care workers in particular medical students are at risk of acquiring infection through professional exposure to infectious diseases. The minority studies have reported on medical students' adherence towards personnel protective equipments and reported lack of adequate practices in relation to compliance towards the personnel protective equipments. (Janjua, et al., 2007)

According to Kotwal & Taneja, (2010) , exposure to particular health hazards are expected to influence definite high-risk for all the health care providers. All the health care workers especially the medical staff who are working in surgical units and Operation Theater are more required to have a reason of a better understanding in adherence with PPE usage which is significant as it provides an assessment of the efficacy of accessible preventative strategies. This could then assist to recognize the preventive variables which are likely to improve the compliance and decrease the risk of infection transmission. Then, it is possible to integrate these preventative approaches into the strategies of health care setting.

Universal precaution is the only strategy so that all these infections could be prevented. Attributable to their inadequate experience in performing invasive procedures, medical students are at particular risk of exposure to blood-borne pathogens (Chopra, et al., 2008). Medical students should have satisfactory knowledge and skills in relation to adherence to personnel protective equipments before their initial training period at hospital which is a vital requirement for compliance. Furthermore, Elliott et al. (2005), reported that dedicated training must be conducted before a medical student carried out any patient procedure especially the ones concerning sharp devices. Physicians' compliance towards the personnel protective equipments has been reported to be with low rate. (Jawaid, Iqbal & Shahbaz, 2009).

In relation to the hazards caused by non compliance to personnel protective equipments by the health care providers , statistics reported by the Central Register of Occupational Diseases in Poland indicates that among 314 new cases of occupational diseases in HCWs in 2005, HBV and HCV represented 42.6% of all cases.9 Despite the substantial reduction in HBV infection since vaccination was introduced in 1989, the incidence of HCV hepatitis in Poland is still on the increase in this occupational group. (Wacawik, siorowski & Inglot , (2003) & Wilczyn, et al., (2005) .

There are many published studies which have focused on the use of PPE among HCWs as part of existing health preventive measures. However; there have been no similar studies on the use of protective equipment by medical interns. This specific study therefore intends to assess

compliance with personnel protective equipments use among medical interns at King Abdul Aziz University, Saudi Arabia, . The results of this study are likely to be of value in modifying existing education programs provided to medical interns in order to enhance the safety measures implementation concerning the interns adherence to standardized use of personnel protectitive equipments.(Damani, 2003).

2. Methods

A descriptive research design was utilized in the current research. A total of 200 medical interns of King Abdul-Aziz University of Medicine were given a structured questionnaire one week before graduation during the internship for the academic year 2015-2016.this number constitute , more than two third of the medical interns for the time of data collection. All wards representing units concerning all the subspecialties' based on the interns rotation were consider as a setting for the current research. The interns at each unit were contacted to discuss the importance of the research and the study protocol. An anonymous 4-items questionnaire was prepared by the authors using the guidelines from a previous American study; Updated US Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, HIV and Recommendations for PEP (2001). all questions had fixed answer categories.

The questionnaire was pilot-tested and dealt with the following topics: demographic data; exposures to patients' blood or body fluids during the previous year; compliance with the use of Personnel Protective Equipments, i.e. gloves, masks, protective eyewear (spectacles included), and gowns when in contact with potentially infective material; possible answers were 'always', 'often' and 'never';. This research examines the data relating to the compliance with Personnel Protective Equipments use. The participants were asked to indicate their perspectives towards personnel protective equipments required to safely implementation of clinical procedures. For each item concerning the (PPE), the proportion of intern's perspectives towards the protective equipments was calculated. Descriptive statistics like percentage was used to describe the findings using SPSS 20. All categories data were analyzed using the Chi-squared test with or without Yates' correction; Statistical significance for all analyses was presumed for P at 0.05.

For the purposes of comparing female & male interns, we grouped all interns based on gander classification. Since occupational experiences had not been organized in a systematic manner for educational purposes, we placed the term intervention in parentheses.

3. Results

The current research study objectives were to evaluate self-reported compliance with personal protective equipment (PPE) use among the medical interns at King Abdul-Aziz University. A total of 200 medical students, from King Abdul Aziz University, were surveyed using a confidential questionnaire. The results indicated that compliance with PPE varied considerably. Compliance was high for gowns and protective eyewear (93.0) & (92.5%) respectively, but compliance level was low for wearing masks (86.5).While presentable number of participants showed non compliance for protective Gowns (6.0%). The statistical comparison among the female and male interns in relation to the compliance to PPE use among the medical interns shows that there was a statistical significant difference in relation to wearing gowns (0.05*), while, the statistical comparison among the interns in relation to the compliance to PPE use was shows the no statistical significant difference in relation to wearing gloves (0.33). None of the interns present in the ward on the day when the questionnaire was administered refused to participate.

Table 1: Compliance to personal protective equipment use among medical interns' students (N 200)

Personal protective equipments	No. of respondents (%)		
	Always	Often	Never
Gloves	197 (89.5)	9 (4.5)	12 (6.0)
Gowns	186 (93.0)	7 (3.5)	7 (3.5)
Protective eyewear	185 (92.5)	8 (4.0)	7 (3.5)
Masks	12 (6.0)	15 (7.5)	173 (86.5)

Table 2: Statistical Comparison of among the Male & Female medical interns Students towards Personnel Protective Equipments' at King Abdul Aziz University

Personal protective equipments	Mean Score		T	P
	Female interns	Male Interns		
Gloves	7.46	7.39	0.433	0.33
Gowns	13.45	14.12	1.6018	0.05*
Protective eyewear	2.31	2.57	2.5645	0.006*
Masks	8.22	8.21	0.0273	0.48
Total	38.08	39.18	1.4166	0.08

Significance at the Level of P<0.05

4. Discussion

The response rate to the current research was excellent, suggesting that this was an area of importance for medical interns. In this research, more than two third of the medical interns were not used mask which were higher compared to a study conducted by Mukharjee et al where (46%) of the doctors wore mask. Moreover, In Saudi Arabia, it was reported that there was a lack of knowledge and compliance of infection control measures by health care providers in hospitals as well as at primary level of care Hesse, et al., 2006).. This was partially explained by the deficiency of the curricular content of medical and nursing schools in Saudi Arabia (Hesse, et al., 2006). as well as in many other developing countries where the role of infection control is not emphasized are often practiced incompletely, with limited understanding and thus suboptimal compliance (Kermode et al., 2005). Assessing medical students' knowledge towards using personnel protective equipments will aid in prevention of nosocomial infections and can provide the foundations for curricular reform necessary to provide them with adequate knowledge and skills.

As well as , this research results is congruent with the results of Dhaliwal, et al., (2011), who reported that medical students' knowledge and attitudes towards adherence to personnel protective equipments' and handling wastes based

on the standards of universal precaution, was revealed low level of performance especially in relation to handling the sharp injuries. The observance of hygiene recommendations by students is reported as being reported a low level of compliance in utilizing personnel protective equipments' (Khapre et al., 2012). Poor compliance may have its roots in a failure to learn this simple, essential behavior at medical school (Mukherjee , et al., 2013). Learning practices are indispensable for improving student knowledge of nosocomial infection and the prevention of infection transmission (Adinma , et al.,2009).

Furthermore, more than (90%) of the medical interns were used gowns and gloves. this present study finding was more as compared to a study conducted in Pakistan by Chopra et al ., (2007) , where only 20.9% of doctors wore gloves . In this study, compliance with personnel protective equipments use was significantly related to the fear of acquiring HIV and probably other infectious diseases at work, with a dose response effect evident. In several published studies, including ours, gloves have been shown to be the most frequently used protective equipment, possibly reflecting the long tradition of wearing them. Moreover, glove use has been shown to be the largest contributor to the efficacy of standard precautions.

Moreover, The current research results revealed that The statistical comparison among the female and male interns in relation to the compliance to PPE use among the medical interns shows that there was a statistical significant difference in relation to wearing gowns (0.05*) which is similar to previous study conducted by Fahey et al., 2001 & Goldman, (2002) , who reported that the main reason behind the surgical staff compliance to personnel protective equipments was fearing from acquiring HIV from patients was ranked as a strong influence on compliance with PPE use. A fear of BBI tends also to be the prime motivator for hospital personnel to change their behavior.

While, more than two third of the medical interns were used protective eyewear which were higher compared to a study conducted by Mukharjee et al (2013) , where (46%) of the doctors wore protective eyewear m in which he explained his study findings due to lack of availability of personal protective equipments which was available with satisfactory number within the current research setting.

5. Conclusions

The findings of the current research are revealed Compliance was high for gowns (93.0) and protective eyewear (92.5%). Although, it consider to be worrisome, because considerable number of medical interns' compliance level towards the personnel protective equipments showed low level of adherence in relation to some of the elements of personnel protective equipments, especially in relation to wearing mask, (86.5). While presentable number of participants showed non compliance for protective Gowns (6.0%), which was expected to report (100 %) as a standardized level of compliance. The statistical comparison among the female and male interns in relation to the compliance to PPE use among the medical interns shows that there was a statistical significant difference in relation to wearing gowns, while, the statistical comparison among the interns in relation to the compliance to PPE use was shows the no statistical significant difference in relation to wearing gloves.

We recommend wider implementation, evaluation and improvement of training in infection control, preferably combined with practical experience especially in caring for infectious patients and easier access and improved comfort of personnel protective equipments.

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Ethical approval: The study was approved by the Institutional Ethics Committee

6. Limitations

The study has a number of limitations. First, compliance' is difficult to quantify reliably. Comparisons of observed and self-reported adherence to barrier precautions among medical interns found significant differences in the respective rates for more protective barriers. Second, because the study sampled only medical interns, the results may not be generalizable to all interns. Third, recall bias is possible. Finally, descriptive research design can be used only to show associations and cannot confirm a cause-and-effect relationship. The 100% response rate to the questionnaire means that the results of this study are likely to reflect accurately the situation regarding the use of PPEs in the selected setting. The current research - findings indicate that despite common contacts with blood, compliance with PPE use among medical interns are acceptable concerning certain items of personnel protective equipments but it shows not acceptable for other items as high rate of non compliance in relation to wearing mask, which shows that the existing strategies to control infections to interns have not been adequate.

There is a need to consider factors that enable medical students, interns and other health care providers to change their behavior, and also the availability, cost and convenience of the preventive barriers. Thus, a combination of strategies is required, including continuous education in infection control, easy accessibility to personnel protective equipments, and improvement in the comfort and convenience of barrier precautions.

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