

## KNOWLEDGE, ATTITUDES AND PRACTICES OF STANDARD PRECAUTIONS AMONG NURSING PROFESSIONALS AT A TEACHING HOSPITAL

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### Abstract

*Background:* Standard precautions (SPs) are considered essential in curtailing the menace of infections. Local data on the use of SPs by healthcare workers are almost non-existent. This study explored the nursing professional's knowledge, perceptions and adherence to SPs at a local teaching hospital.

*Methods:* A cross-sectional exploratory survey of nurses (n = 50) working at Central Park Teaching Hospital (CPTH) was conducted between March-May 2017, using a comprehensive questionnaire assessing their knowledge, compliance and attitude toward SPs as well as availability and accessibility of safety equipment.

*Results:* Forty eight of the 50 nurses surveyed had received formal training regarding SPs while 49 expressed fair knowledge of SPs. High compliance (97%) with handwashing while low compliance (65%) with the use of gloves was observed. A high proportion (72% of nurses) considered SPs as idealistic, waste of resource and interference in work and 84% accepted overlooking compliance with SPs when under heavy workload. Almost all respondents deemed institutional provision of sharps bins, masks, gloves and antiseptic liquids as acceptable but more than half described availability and/or accessibility to surgical gloves, eye goggles and plastic aprons as unsatisfactory. Most nurses (> 80%) perceived occupational health risks adequately but the practice of post-exposure screening and prophylactic vaccination was seen in less than 35% of the nurses.

*Conclusion:* A fair level of knowledge and compliance to SPs was observed with a few shortcomings identified particularly in the attitude and perception towards SPs. Institution of teaching programs, surveillance mechanisms and appropriate provision of safety utilities is recommended to strengthen knowledge, alter attitude and enhance adherence of nursing professionals to SPs.

*Keywords:* Standard precautions, Occupational health, Infections.

### INTRODUCTION

Infections constitute a very common health problem worldwide, causing considerably high morbidity and mortality.<sup>1,2</sup> Healthcare workers are more commonly exposed to blood and body fluids and are also susceptible to needle prick injuries and infections among healthcare workers are usually the result of these exposures.<sup>3</sup> Initially, the Center for Disease Control and Prevention (CDC) recommended certain precautions for patients known or suspected to be infected. It was later revised that precautions must be consistently used regardless of infection status, and they were called 'Universal Precautions'.<sup>4</sup> CDC later included the universal precautions in a comprehensive new prevention concept termed the 'Standard Precautions' (SPs) which included hand washing, use of protective barriers (gloves, gown, caps, masks), care of equipment and clothing used during procedures, environmental control (surface processing protocols, waste handling) and adequate discarding of sharp instruments.<sup>5</sup>

Preventative healthcare and SPs are now considered pivotal components of good clinical practice.<sup>6</sup> In the developed world, great emphasis is laid in ensuring that (SPs) are adhered to by all medical professionals involved in dispensing healthcare to patients including doctors, nurses, paramedical staff and other healthcare related professionals.<sup>7</sup> Healthcare workers should follow SPs because this helps in reducing the incidence of spread of infections.<sup>8</sup>

There are several factors, ranging from personal to organizational, which are responsible for non-adherence to the basic principles of SPs among healthcare providers.<sup>9-11</sup> Although there is an increasing awareness locally about the need of instituting safe clinical practice, the extent to which this is practiced remains unknown. Medical doctors are seemingly more cautious about compliance with safety procedures due to their direct involvement with patients.<sup>12</sup> The associated healthcare staff such as nurses and paramedical personnel are even more exposed to patients and their adhe-

rence to SPs is also vital. This safety aspect of modern medical practice is important for the well-being of the people providing medical care as well as the patients who are being looked after by them. However, the loco-regional data on SPs are extremely limited, and mainly related only to the complications arising from non-observance of SPs.<sup>13,14</sup> The aim of the current study was to estimate the extent of adopting SPs by the nursing staff at a local teaching hospital and identify possible reasons of any observed deviation from SPs.

**MATERIAL AND METHODS**

This cross-sectional exploratory study was conducted during the period of March-May 2017 at Central Park Teaching Hospital (CPTH) which is affiliated with Central Park Medical College (CPMC). The institution is recognized by Pakistan Medical and Dental Council (PMDC) and College of Physicians and Surgeons, Pakistan (CPSP) as a tertiary healthcare and medical teaching facility (for both undergraduate and postgraduate training).

Non-random convenience sampling technique was employed. A total of 50 nursing personnel working at CPTH participated in the study. The sample size was calculated using the formula  $N = 4Z_{\alpha}^2 S^2 / W^2$  with 95% confidence interval for mean. The study employed a validated comprehensive structured questionnaire having Likert-type rating scale.<sup>6</sup> Such questionnaires have been used by most investigators previously.<sup>15</sup> The questionnaire included items assessing the nursing staff's basic knowledge and compliance with content and activity requirement of SPs. The questionnaire was in the English language and consisted of 42 items divided into 6 sections namely socio-demographic data, compliance with standard precautions, knowledge of standard precautions, attitude and perception of preventive effectiveness, availability and accessibility of safety gear, and risk perceptions.

The questionnaires were handed out to participants by the investigators at the site personally and collected the following day once they had been completed. All the participants were informed of the study details by a member of the research team and written consent was obtained prior to data collection. Confidentiality and anonymity of the respondents were maintained throughout the study data collection. The study was reviewed and approved by the Central Park

Research Committee.

The data obtained were key-coded and entered into a spreadsheet using Microsoft Excel. The data sheet was then imported into Statistical Package for Social Sciences (SPSS) software version 23 for statistical analysis. Frequencies, percentages, mean and median were used for analyzing socio-demographic data and assessing level of knowledge, perception and degree of compliance with SPs.

**RESULTS**

There were 50 respondents in the study of which 49 were females (98%) and only 1 male (2%). All of them were trained nurses working in different departments of CPTH. The age range of the respondents was 18 to 46 years with a mean age of 28 years. 45 (90%) of the respondents were single while 5 (10%) were married. Most of them (96%) had received formal education of SPs in curricular studies (48%) and as part of in-service training (48%) while 4% lacked such training. Nearly all of the respondents (98%) were well-aware of SPs and 94% claimed to routinely follow SPs while working at the hospital. 94% were of the view that SPs must be followed regardless of a patient's infection status. Hand washing before and after handling the patients had the highest rate of compliance (97%) while the use of gloves had the lowest rate of compliance (65%) (Table 1). A rather nonprofessional trend was observed in terms of the healthcare worker's attitude toward SPs. More than three-quarters of the nurses considered SPs as idealistic, waste of resource and hindrance to delivery of efficient nursing care (Table 2). Work pressure also seemed to negatively influence nurses' adherence to SPs with 84% agreeing that they may forget complying with SPs in the face of excessive workload (Table 2). Regarding safety apparatus, almost all (> 95%) of the surveyed individuals described the provision of sharps containers, gloves, face masks and antiseptic liquids by the institution as adequate. However, only 48%, 28% and 28% of the respondents expressed satisfaction with the availability of and/or access to surgical gloves, eye goggles and plastic aprons respectively (Table 3). The participants showed adequate risk perception (> 80%) but the practice of screening and vaccination post-exposure was found to be low (< 35%) (Table 4). The detailed results of the administered survey are summarized in Tables 1-4.

**Table 1:** Compliance with standard precautions.

No.	Questions	Always	Usually	Often	Sometimes	Seldom	Never
1.	I wash my hands before touching a patient	94%	1%	3%	2%	0%	0%
2.	I wear gloves before touching a patient	65%	1%	5%	28%	1%	0%
3.	I wash my hands after touching a patient	97%	2%	1%	0%	0%	0%

4.	I wash my hands immediately after the removal of gloves	97%	1%	2%	0%	0%	0%
5.	I consider all patients as potentially contagious	74%	21%	1%	2%	2%	0%
6.	I protect myself against the blood and fluids of all patients, regardless of their diagnosis	73%	2%	1%	23%	1%	0%
7.	I change gloves between contacts with different patients	71%	4%	2%	23%	0%	0%
8.	I wear a facemask whenever there is a possibility of body fluids splashing in my face.	97%	0%	1%	2%	0%	0%
9.	I never recap needles	84%	11%	0%	4%	1%	0%

**Table 2:** Attitude and perception of preventive effectiveness.

No.	Questions	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	Using SP for a patient with suspected infectious diseases is waste of resource	22%	4%	2%	18%	54%
2.	In general, when I wear goggles, masks, etc., it affects my ability to deliver nursing care	16%	8%	4%	70%	2%
3.	In general, pressure of work makes me forget to use protective barriers sometimes.	2%	4%	2%	84%	0%
4.	In general, I find the use of SP for all patients to be far too idealistic.	6%	14%	8%	16%	56%
5.	Following SP keeps me safe from contagious disease	6%	2%	2%	56%	34%
6.	Infectious diseases can be treated hence protective devices are not required	28%	52%	4%	14%	2%
7.	I can't always follow SP because my patients' needs come first	14%	4%	0%	78%	2%
8.	If standard precautions are followed for all patients, the risk of getting HIV/AIDS is very low.	4%	2%	0%	30%	64%
9.	I can reduce my occupational risk for HIV,HBV infection by complying with standard precautions	4%	2%	0%	30%	64%
10.	I can reduce my risk of catching a communicable respiratory disease by using a surgical mask.	4%	2%	2%	22%	70%
11.	If I always keep hand hygiene, I can prevent many communicable diseases	4%	0%	4%	32%	60%
12.	I want to do what my physicians and colleagues want me to do regarding SP	6%	10%	0%	54%	30%

**Table 3:** Safety Equipment: Availability and Accessibility.

No.	Questions	Yes	No	Unsure
1.	Clean gloves	100%	0%	0%
2.	Surgical gloves	48%	20%	32%

3.	Soaps and antiseptic solutions	100%	0%	0%
4.	Surgical masks	96%	4%	0%
5.	Water sinks	96%	4%	0%
6.	Goggles	28%	54%	0%
7.	Coded dust bins	58%	2%	40%
8.	Safety boxes for sharp needle collection	96%	4%	0%
9.	Plastic aprons	28%	56%	0%

**Table 4:** Risk Perception.

No.	Questions	Yes	No	Unsure
1.	Not knowing the HIV, hepatitis and TB status of patients before giving them care puts me at a very high risk of contracting these infections	94%	6%	0%
2.	Working with a colleague who does not adhere to standard precautions in the course of duty puts me at a very high risk of HIV, hepatitis and TB infection?	78%	8%	14%
3.	Do you go to a physician and get screened and vaccinated for hepatitis B if you get pricked accidentally by a used needle?	26%	72%	2%
4.	Do you go to a physician and get screened and took for HIV prophylaxis if you get pricked with needle and splashed accidentally with any body fluid?	34%	64%	2%

**DISCUSSION**

Non-adherence to SPs is a worldwide phenomenon that carries a hugely negative health-economic impact.<sup>3</sup> The present study was conducted to thoroughly assess knowledge, behavior and practice of SPs by nurses and it provides potentially very useful data from a regional healthcare facility.

The preponderance of women participants (98%) in this study is reflective of the social, cultural and historical background of the nursing profession. This female domination has also been shown previously with women comprising 89% of the nursing professionals in Brazil.<sup>7</sup> According to statistics released by the United States department of labour, 92.1% of registered nurses in the year 2003 were women.<sup>16</sup>

Our results revealed that a larger proportion (≥ 95%) of the surveyed individuals in the local set-up had adequate knowledge of SPs. In a recent study by Amoran et al., 80% of the interviewed healthcare personnel were well versed in SPs but about one-fifth did not recognize post-exposure prophylaxis and vaccination as an integral part of SPs.<sup>17</sup> A study on nurses enrolled at a university in the Philippines (n=58) found that almost 90% of the student nurses had fair knowledge of SPs.<sup>18</sup> In another cross-sectional survey, Vaz et al. reported that most of the nurses (90%) had very good knowledge of SPs.<sup>19</sup>

A high proportion (97%) of nursing professionals in our study observed hand washing while handling patients and compliance with non-recapping of used

needles was also high (96%) (Table 2). These findings are concordant with those reported previously by Sadoh et al.<sup>20</sup> Our data suggest that almost two-thirds of the healthcare workers wear gloves before handling patients which is similar to rates observed previously.<sup>17</sup>

Nursing staff working at a teaching hospital in Brazil were recently shown to have intermediate adherence to SPs irrespective of their professional grade or practice.<sup>7</sup> An intermediate level of adherence has also been described previously in nursing professionals working in intensive care.<sup>21</sup> In a cross-sectional study by Felix et al., 78% of the nurses reported using SPs.<sup>22</sup> Moreover, findings from a previous study of nursing professionals (n = 256) at a Brazilian university hospital showed that 60% of the nurses had high scores for adherence to SPs.<sup>23</sup> The present study also documented a high compliance with SPs by the healthcare workers at the local teaching hospital (Table 1) but differences in terms of duration or nursing practice or professional category were not assessed. The observed high compliance may be attributed to the subjective self-reporting nature of the survey instrument employed in our study.

It is **concluded** that non-compliance with SPs is public health problem that arises from a combination of lack of awareness, inadequate and ineffective training, flawed personal and institutional attitudes toward preventative medicine as well as dearth of financial, material and human resources. The local hospital authorities need to implement strategies to ensure

nurses' adherence to SPs which hold key to protecting the health of healthcare workers and patients alike. Intensive reinforcement via continuing education programs for nurses should be carried out with a strong emphasis on application and benefits of SPs.<sup>24</sup> Furthermore, research to identify the factors that may potentially influence nurses' compliance and attitude toward SPs should be carried out as changing current practices demands prior knowledge of such factors. In addition to individual factors, organizational factors have also been implicated in reduced compliance with SPs.<sup>25</sup> Availability of all personal protection equipment and related facilities and utilities must be ensured and healthcare workers should be provided ready access to them. It is also recommended that reporting procedures and surveillance systems be established for the accounting of occupational exposure and hospital-acquired infections.

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#### Authors' Contributions

A Arif, SIA Shah, A Mumtaz and AS Chughtai were involved in conception and design of the study, review and finalization while A Arif and SIA Shah were additionally responsible for data collection and analysis. The manuscript was seen and approved by all authors.

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