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### RESEARCH ARTICLE

#### KNOWLEDGE, ATTITUDE AND PERCEIVED BARRIERS ON CARE OF PATIENTS WITH METHICILLIN-RESISTANT STAPHYLOCCOCUS AUREUS (MRSA), AMONG STAFF NURSES AT A REGIONAL HOSPITAL, TRINIDAD.

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##### Key words:-

Knowledge, MRSA, registered nurses.

#### Abstract

**Aim:** To determine the staff nurses knowledge regarding MRSA infection control practices, and to determine the relationship between knowledge of staff nurses while adapting practices regarding MRSA infection control prevention and selected social demographic variables.

**Methods:** A descriptive design utilizing survey method was used. A sample of 60 RNs, from a tertiary care hospital in South Trinidad were recruited using stratified sampling technique. A blue print showing the distribution of items (Pathogenesis, Predisposing and preventive factors), was prepared prior to the construction of self-administered knowledge questionnaire on MRSA – 30 Items and adaptation Scale on MRSA – 20 Items. Adaption Scale was designed to analyse the level of compliance of RNs practice to MRSA protocol. Data were analysed using SPSS Version 19.

**Results:** Majority of the RNs (72.41%) scored on pathogenesis of MRSA (mean  $6.52 \pm 1.65$ ). 56.78% of RNs demonstrated knowledge on preventive factors of MRSA. However only 51.33% had knowledge on predisposing factors of MRSA. More than half (34) of the staff scored on the undecided section of the adaption scale whether nurses follow correct protocol for MRSA prevention. Most RNs agreed that they maintain proper hand hygiene. However within the Predisposing factors a large number of RNs (41) were unsure of maintaining hand hygiene, which was contradictory to responses regarding hand hygiene. A positive correlation was seen between knowledge scores of RNs and their place of work ( $p=0.001$ ). RNs in surgical wards demonstrated better overall knowledge of MRSA, in comparison to RNs working in medical wards. One-way analysis of variance (ANOVA) between level of education and knowledge of MRSA among RNs was found to be significant at 2.432 ( $p=0.03$ ).

**Conclusion:** It was concluded that level of RNs knowledge on MRSA was inadequate, which translated into their non-adaptation of

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prevention protocol which has implications for ongoing continuous educational programs.

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## Introduction:-

*“Health is not valued till sickness comes.”*

~Thomas Fuller

Methicillin-resistant *Staphylococcus aureus* (MRSA) infection has received much attention in both the medical and non-medical press (Phillips PS, Golagani AK, Malik A & Payne FB, 2010). Hospital-acquired infections with *Staphylococcus aureus*, especially methicillin-resistant *S. aureus* (MRSA) infections, are a major cause of illness and death, imposing serious economic costs on patients and hospitals (Eili Klein, David L. Smith, & Laxminarayan, R, 2007). Average cost of hospital stay and length of hospitalisation for MRSA infection is \$14,000 compared to \$7,600 for other types of hospital stays. The length of hospitalisation for MRSA infection is nearly double that of other type of stay, 10 days compared to 4.6 days respectively.

Methicillin-resistant *staphylococcus aureus* (MRSA) was discovered fifty-four years ago by the late professor Patricia Jevons, London in 1961, two years after Methicillin was first introduced to the world (MRSA Survivors Network, 2011). MRSA bacterium has since spread and mutated throughout the decades in Europe and all other Continents. This has led to MRSA being considered a superbug that causes devastating and fatal effects on patients' healthcare facilities worldwide, which now include the community. *Staphylococcus aureus* is recognized as a virulent bacterium causing serious infections of the skin and soft tissue, wound infection, bacteraemia, pneumonia, and endocarditis; which can eventually lead to death. Renowned as an organism which has potential to acquire resistance to antimicrobial agents.

Infection prevention is a fundamental aspect required for quality of care and patient safety within Healthcare settings (Pittet et al, 2008); in order to prevent the prevalence of avoidable adverse conditions, such as MRSA (Gould et al. 2009).

There are approximately, one in ten hospital admissions worldwide that result in an HAI; where MRSA infections are estimated to be isolated in at least 8% (Halcomb et al.,2008). The high risk for contracting MRSA, have been attributed to both antibiotic resistant and non-resistant organisms. The potential consequences have sparked global concern among leading healthcare professionals and the general public.

## Background and Need for the Study:-

The main route for cross transmission of MRSA comes from the hands of nursing and healthcare personnel; notably when there is negligible compliance to strict hand-washing techniques (Pittet, 2000). Provision of health care is frequently performed by nurses and other healthcare personnel. Patients who are seriously ill have first-hand contact with the nurse. Therefore it is necessary to ensure that nurses receive the correct guidance and information concerning infection control policy, hygiene precautions and antibiotic resistance; as they continuously care for patients who can be at risk for multidrug-resistant bacteria (Mamhidir, Lindberg, Larsson, Fla'ckman, & Engstro'm, 2011). Compliance to prevention measures to MRSA can be established through infection control policies which reflects the core aspect in quality care and patient safety (Brannigan et al. 2009).

It is quite alarming that MRSA patients are twice as likely to die from their infection; especially if the infection spreads to deeper tissues through broken skin, resulting from surgical site, carrying wound infection, then to travel further into the bloodstream leading to bloodstream infection bacteraemia (Su, Chang, Yan, Tseng, Chien & Fang, 2013). If the infection advances to the lungs, this causes, for example ventilator-associated pneumonia. Other common complications of MRSA are Endocarditis and death. Patients who have healthcare associated MRSA (HA-MRSA) infections result with increased mortality risk, have extended hospital stay, resulting in increased medical costs, as compared to those patients who did not acquire HA-MRSA infections (Su, Chang, Yan, Tseng, Chien & Fang, 2013).

Unfortunately the spread of bacteria resistant infection is on the increase; there was a 12.8% prevalence of MRSA in three major regional hospitals in Trinidad and Tobago (Akpaka, P., et al., 2007). There were also 65 bacterial strains of MRSA located within the West Indies, which were isolated from 35 men and 30 women. All but four of the

individuals were hospital inpatients whose mean age was 55.8 years (Chroboczek et al, 2013). Presence of the infections was considered hospital acquired in 85% of cases and considered at risk for acquiring MRSA in hospital. Other risk factors outlined are patients who have chronic haemodialysis, a compromised immune system, and hospitalization for more than 48 hours within the last 6 months, received antibiotic treatment in the last 6 months and have regular outpatient wound care (Chroboczek et al, 2013).

According to The Infection Control Department, South West Regional Health Authority (SWRHA) Trinidad, there has been seventy-eight patient (78) cases throughout the adult medical and surgical departments of the hospital during the period 2011-2014. To the best of our knowledge, there has not been any published study in Trinidad that has investigated the level of awareness among staff nurses on MRSA control guideline recommendations. Taking this into account, our study was developed to assess the level of awareness of staff nurses, at a general hospital, Trinidad concerning MRSA guideline recommendations, and to determine the reasons, if any, for non-adherence.

This research propose to investigate the staff nurses knowledge on MRSA, is an effort to outline interventions necessary for improvement of staff nurses education regarding MRSA. Investigating attitude and perceived barriers towards caring for patients with MRSA, will assist in strategies for attaining higher standard clinical practices on patient care and improve staff nurses' compliance to MRSA infection control guidelines.

#### **Objectives of the Study:-**

1. To determine the staff nurses knowledge and attitude regarding MRSA infection control practices.
2. To assess the perceived barriers toward compliance to adapting MRSA infection control practices among staff nurses.
3. To correlate the knowledge and attitude of staff nurses while adapting practices regarding MRSA infection control prevention and selected social demographic variables.

#### **Research question:-**

Main question:-

1. Does the staff nurses' knowledge and attitude on MRSA infection control practices provide benefit for better patient care?

#### **Sub questions:**

1. What are the staff nurses' level of knowledge regarding the prevention, the risk and severity of MRSA?
2. What are the identified barriers of staff nurses' for adapting practices which comply with MRSA infection control prevention?

#### **Application of Theory:-**

The main objective of this study was to examine the knowledge and attitude of staff nurses regarding MRSA, currently practicing in a general hospital.

While various literature provides some information regarding staff nurses' level of knowledge, attitude and health beliefs about MRSA in various settings, no studies have examined the health beliefs and attitude of staff nurses' in Trinidad settings. The framework of this study, the Health Belief Model (HBM), enables focus on improving public health by examining staff nurses' knowledge and attitude of MRSA. The HBM will help provide insight into problems in current practice, identify recommendations, reduce practice barriers, and identify educational needs of the staff nurses.

The development of the HBM was to improve public health by understanding why people did and did not adhere to preventive health measures (Carpenter, 2010). The investigators from the Public Health Service developed this model to understand why individuals failed to use preventive services (Rosenstock, 1974). According to Rosenstock et al. (1988), who correlated social learning theory and the HBM in explaining human behaviour, the HBM hypothesized that health activity depended on three factors:

1. The existence of sufficient motivation (or health concern) to make health issues salient or relevant.
2. The belief that one can be susceptible to a serious health problem or to the sequel of the illness or condition. This is often termed perceived threat.

3. The belief that following a particular health recommendation would be beneficial in reducing the perceived threat, and at a subjectively acceptable cost. Cost refers to perceived barriers that must be overcome to follow the health recommendations.

The first factor of the HBM aligns to how strongly individuals believe they are susceptible to a particular illness or negative health outcome. It is important to note staff nurses' perceived susceptibility or risk because if they believe that a negative health outcome will not influence their life, they will not be motivated to make changes (Carpenter, 2010).

The second factor relates to an individual's perceived severity. This is strongly compared to susceptibility because if one feels that the illness is not severe enough to impact one's life, there will be no motivation to avoid it. This degree of severity can be judged by the degree of an individual's emotions regarding the thought of a disease and by the difficulties the individual believes the disease can cause (Rosenstock, 1974).

The third factor outlines the perceived benefits. This factor highlights the need for preventive measures. If staff nurses perceive no advantages to practice preventive measures, they are less likely to comply with infection control guidelines. Alternatively, if an individual believes a preventive measure is beneficial in reducing one's susceptibility to or severity of an illness, the individual is more likely to take action (Rosenstock, 1974). The fourth factor relates to perceived barriers. If barriers are identified in adopting preventive measures, then staff nurses are less likely to adhere to infection control practices. According to Rosenstock (1974), if readiness to act is high and the negative aspects of a health action are low, the action in question is more likely to be taken; however, if the readiness to take action is low and the negative aspects are high, this presents a barrier to taking action. Other variables to the HBM model have been identified as cues to action and self-efficacy. Cues to action identifies one's readiness to change with the assistance of an additional element, such as advice from others, media campaigns, or reminder cards.

These cues to action could also be an internal element, such as negative change or perception in bodily state (Rosenstock, 1974). This factor of the HBM is the most underdeveloped and rarely measured element in the literature (Carpenter, 2010; McEwen & Wills, 2011). This factor was used to determine what healthcare professionals consider being their most trusted source for health information and their preferred method for receiving this information. The required intensity of cues to actions to trigger a change varies with an individual's perceived susceptibility and severity (Rosenstock, 1974).

#### **Updated Model:-**

Initially, the HBM ignored the influences of self-efficacy in influencing health behaviour change (Rosenstock et al., 1988). When the HBM was first developed, the focus was more on accepting simple behaviour health changes such as immunizations. Now, however, a vast majority of health behaviour changes require individuals to make long-term changes that modify their lifestyle (Rosenstock et al., 1988). Self-efficacy identifies an individual's belief in their ability to perform a healthy action. If staff nurses have identified influences that motivate them to pursue healthy behaviours, then they are also most likely to adhere to preventive measures. For individuals to implement change, they must feel competent.

#### **Review of Literature:-**

A common salient issue within the articles reviewed, was the definition of MRSA as a mutated super-bug causing grave concern, spreading within all hospitals world-wide and also within the community setting (Raygada & Levine, 2009).

Another issue was the specific use of antibiotic treatment. Previously antibiotic treatment was acclaimed as one of the most important discoveries of modern medicine. However the excessive use and abuse of antibiotics has been linked to bacteria mutation leading to antibiotic resistance which contributes to further spread of MRSA. The irony being, antibiotics were developed for controlling bacteria; but have strengthened them; thus leading to drug resistant bacteria rendering some antibiotics ineffective. The importance of having prudent control while prescribing and using antibiotic treatment has been identified (European Centre for Disease Prevention and Control (ECDC, 2013)

Infection control measures are also most prominent within the general information of MRSA; specifying the need for healthcare workers and staff nurses to adhere to strict hand washing technique and contact isolation precaution practices. Staff nurses and other healthcare workers' compliance with infection control policies, especially hand

hygiene, has been highlighted as sub-optimal eventually posing a high risk to patient safety (Allegranzi & Pittet, 2009).

A relevant aspect within the literature pertains to the discrepancy of information and practices of nurses within different clinical areas regarding infection control policy and prevention of MRSA. Firstly was the debate as to whether it is necessary for MRSA patients' to be nursed in isolation. Contact isolation is established as necessary but many clinical areas do not have the bed adequacy or the staff to always manage MRSA patients in isolation.

Hand washing techniques, screening in isolation and protective clothing are all cited in the literature as pertinent practices for MRSA control (Lindberg, 2012). One has to be cognizant as to whether, there are appropriate resources to properly facilitate infection prevention measures, especially in cases where isolation of the patient is not physically possible. Furthermore newly diagnosed patients' with MRSA infections would have commenced treatment within the open clinical area; thus stressing the fact that skin contact, hand hygiene, personal and environmental cleanliness are imperative and must be standard.

Orrett and Land (2006) study to analyse the prevalence of methicillin resistance among isolates at a regional hospital in Trinidad. Over the past twelve years there have been dramatic changes in the susceptibility of *S. aureus* in both hospitals and community settings in Trinidad (Orrett, 2001). Prevalence of MRSA in the hospital setting has increased from 12.5% in 1999 to 20.8% in 2004. These isolates were associated with infected surgical/burn wounds which may have become infected through the hands of healthcare professionals during change of dressings. Infection prevention methods aimed at proper hand hygiene procedures can interrupt the spread of MRSA.

The spread of bacteria resistant infection is unfortunately on the increase; there is a 12.8% overall prevalence of MRSA within in three major regional hospitals in Trinidad and Tobago (Akpaka, P., et al., 2007). There were also 65 bacterial strains of MRSA located within the West Indies, which were isolated from 35 men and 30 women. The mean age of the persons was 55.8 years. All but four of the individuals were hospital inpatients whose mean age was 55.8 years (Chroboczek et al, 2013). Presence of the infections were considered healthcare associated in 85% of cases.

Recent surgical intervention accounted for (HAI) hospital acquired infections with patients who were also considered at risk for acquiring MRSA in hospital. Other risk factors outlined are patients who have chronic haemodialysis, a compromised immune system, and hospitalization for more than 48hours within the last 6months, received antibiotic treatment in the last 6months and have regular outpatient wound care (Chroboczek et al, 2013).

There were nine (9) articles within this review that had examined staff nurses' and healthcare workers' knowledge on caring for MRSA patients, together with fulfilling infection prevention measures. Easton, Sarma, Williams, Marwick, Phillips & Nathwani, (2007) studied behaviour change based on examination of and influencing knowledge with doctors and staff nurses; while attempting to improve staff compliance with hygiene precautions. The survey design revealed deficient knowledge of infection control and management of MRSA patients within emergency hospitals, where only 36% nurses and 30% doctors, correctly identified the sites for MRSA colonization.

There was also another study which examined the knowledge of and attitudes regarding MRSA patients, while addressing isolation and hygiene precautions in hospitals. There were significant variation and deficiency in both of these areas. The descriptive survey design utilized a questionnaire for knowledge on MRSA, infection control and staff nurses' attitude (Askarian, Mirzaei, Mundy, McLaws, 2005).

MRSA protocols were examined in a study within five Dutch hospitals using a questionnaire and a practice test. Results identified adequate knowledge of, and attitude to patients; however following MRSA protocols proved difficult due to issues with accessibility, comprehensive access and application of the information. This study pinpointed a valid consideration where it was impractical to use a single MRSA protocol for all hospital staff, as a result of different decisions staff are required to take according to circumstances (van Gemert-Pijnen, Hendrix, van der Palen, Schellens, 2005).

Lindberg and Lindberg (2012) conducted a descriptive survey design by questionnaire to 411 haemodialysis nurses, investigating knowledge of these staff nurses to MRSA patients. The evidence revealed for analysis that a

considerable proportion of haemodialysis nurses lacked sufficient knowledge about common sites of MRSA colonisation, its prevalence and treatment, together with infection control measures. Two further studies investigated cross sections of healthcare workers, inclusive of nurses (Biboh, 2012; DeVoe, 2014). Both these studies focused on knowledge regarding MRSA and clinical practice concerning infection prevention measures of MRSA.

DeVoe (2014) used both survey and actual observation of clinical nursing practices. Significant deficiencies were noted in knowledge scores and clinical practices especially hand washing, even though participants rated themselves highly for adherence to prevention measures.

The aspect of addressing staff nurses' attitude and caring for patients with MRSA, is very limited in the literature. Indeed the aspect of staff nurses' attitude was addressed in conjunction to other variables, for example, knowledge, hand hygiene and adaptation to infection control measures.

Three other particular studies were identified that were pertinent to the caring attitudes of healthcare workers which included staff nurses.

Lindberg, Carlsson, & Skytt, (2014) investigated five patients who live with MRSA and twenty healthcare professionals (20), using one-to-one semi-structured interviews and semi-structured focus group interviews. Although the study sample was small which can be biased toward generalization of the study; there were some interesting findings. The small group of patients identified being stigmatized by healthcare professionals who had treated them, both doctors and nurses. Health professional adherence to infection prevention measures was negligible. Recommendations are for both doctors and nurses to have further education and review professional patient interaction.

The second study conducted by Barratt, Shaban, and Moyle, (2010) where one-to-one interviews were utilized with a sample of ten (10) MRSA positive patients in protective isolation. One repetitive theme was patients' feeling stigmatized being in isolation and nurses' were inconsistent with practices during treatment. The third researched study, investigated sixteen patients conducting one-to-one interviews. The theme of stigmatization was common for all persons who also expressed that nurses and other healthcare workers did not provide sufficient information to patients about MRSA.

### **Methodology:-**

A descriptive correlational design was used in this study, to examine the relationship among variables. The variables under the study were dependent and demographic variables.

**Dependent Variable:** Staff nurses knowledge and attitude on caring for patients with MRSA.

**Demographic variables:** Age, gender, ethnicity and number of years' experience as a staff nurse, educational qualifications, exposure to information and material on MRSA, pre- attendance to continuing education for MRSA, and if a member of the Infection Control Unit

A stratified random sampling approach was utilized to ensure the resultant sample is most accurately representative of the population.

1. The entire list of staff nurses working at a selected Regional General Hospital was obtained from the service register.
2. Three different lists or clusters of where staff nurses were working was obtained. This included all areas of Medicine, Surgery and Intensive Care Units.
3. Using simple random table, a sample of staff nurses was drawn from the three major areas of Medicine, Surgery and Intensive Care Units.

A total of sixty nurses was short listed for the final study.

**Inclusion criteria:** Staff nurses who:

1. Are working in a selected Regional General Hospital only
2. Give consent for the study

**Exclusion criteria:** Staff nurses who:

1. Don't give consent
2. Health personnel who are not employed as staff nurses at the hospital.

**Ethical Consideration:** Permission was secured from the Campus Ethics Committee, of the University to conduct the study at the Hospital. Similarly permission was secured from the Ethics Committee of Selected Regional Health Authority. Informed consent was secured from the staff nurses, to conduct the study through the Hospital.

**Tool for data collection:** To assess knowledge, attitude and perceived barriers on care of patient with Methicillin-Resistant Staphylococcus Aureus (MRSA), among staff nurses at a regional hospital, Trinidad, the following tools were developed.

**Section A:** Demographic Data – 15 Items

**Section B:** Nurses knowledge and attitude questionnaire on MRSA – 30 Items

**Section C:** Adaptation Scale on MRSA – 20 Items

**Results and Discussion:** The analyses of the data were carried through conventional, tabular and functional methods.

Characteristic of study participants are presented in table 1.

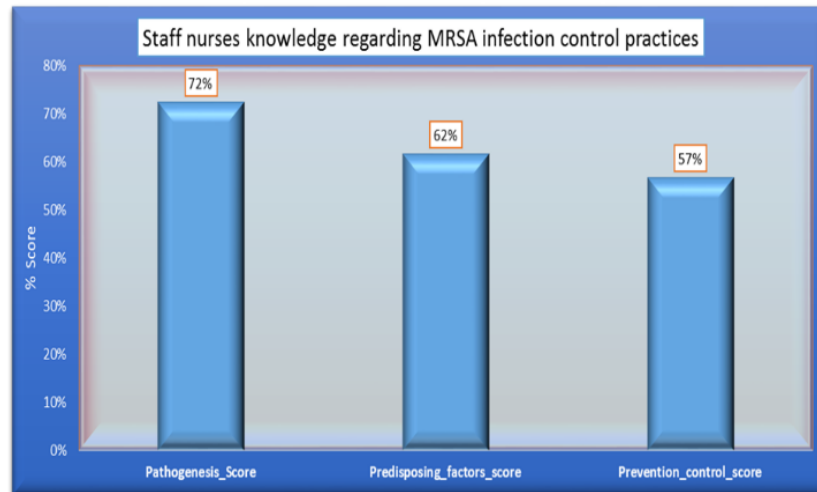
**Table 1:-** Frequency distribution of demographic variables

**N=60**

Variable	Frequency	Percentage
<b>Gender</b>		
Male	11	18.3
Women	49	81.7
<b>Religion</b>		
Christianity	43	71.7
Hinduism	14	23.3
Islam	3	5
<b>Ethnicity</b>		
Afro Trinidadian	19	31.7
East Indian	27	45
Mixed; East Indian/Afro Trinidadian	14	23.3
<b>Professional Education</b>		
Registered nurse/midwife	26	43.3
Diploma/associate degree	18	30
BSc Nursing	15	25
MSc Nursing	1	1.7
<b>Place work</b>		
Medical ward	31	51.7
Surgical ward	20	33.3
Intensive care unit	9	15

**Objective 1: To determine the staff nurses knowledge and attitude regarding MRSA infection control practices.**

Analysis of staff nurses knowledge and attitude regarding MRSA infection control practices was categorized on Pathogenesis of MRSA, Predisposing factors of MRSA and Prevention & Control measures of MRSA. The categories were applied to identify specific areas of knowledge concerning MRSA as depicted in Figure 1.



**Figure 1:-** Bar Diagram depicting Staff Nurses Knowledge regarding MRSA infection control practices

The area of Pathogenesis of MRSA scored highest 72.41%; thus, it can be inferred that staff nurses have a good overall knowledge of Pathogenesis of MRSA, the manner in which the disease developed. The two other subsections, Predisposing factors of MRSA and Prevention and control of MRSA had different results. Predisposing factors had 51.33%, where it can be predicted that staff nurses need more education in this area. The Prevention and control for MRSA section revealed a 56.78% score. This area of education is necessary to prevent the spread of infection which is usually at the hands of staff nurses who take care of seriously ill patients. It can be inferred that continual updates for staff nurses' in house education is needed.

Staff nurses knowledge regarding Pathogenesis of MRSA revealed that almost 50% of participants answered questions incorrectly concerning clinical application and case study of disease.

Knowledge regarding Predisposition to MRSA also revealed that certain areas staff nurses' had limited knowledge on risk factors associated with MRSA. More than 50% responses answered incorrectly for questions that outlined typical access sites for MRSA, surgical asepsis and highest link to MRSA outbreaks. Prevention and Control measures for MRSA are fundamental to clinical nursing practice and improved patient care. Participants scored 56.78% of correct responses.

Within the hospital settings, MRSA spreads from patient to patient through human hands, especially when nurses and other healthcare workers' provide care by touching patients. Contamination from MRSA is also contracted from skin contact of surfaces, for example unclean inanimate objects present in the infected patient's rooms or areas where the patient had occupied (Biboh, 2012). Therefore it must be concluded that nurses and health workers are essential towards preventing the spread of MRSA infection and must be thoroughly educated on predisposing/ risk factors for MRSA.

#### **Objective 2: To assess the perceived barriers to adapting MRSA infection control practices.**

The adaption scale was formulated to analyze the level of compliance that staff nurses practice to MRSA protocol. Using an adaption scale was a method to outline the barriers that hindered the implementation of MRSA protocol. Checking the adaption scale displays scores of the staff nurses, on certain practices in order to fulfil clinical compliance.

Examination into the," Prevention and control section' revealed that more than half of the staff were undecided whether nurses follow correct protocol for MRSA.

Further to this, other corresponding questions revealed that most participants had agreed that they maintain proper hand hygiene. However within the Predisposition Section a large number of responses are unsure of maintaining hand hygiene, which is in contradiction to previous responses regarding hand hygiene. Proper hand hygiene is a



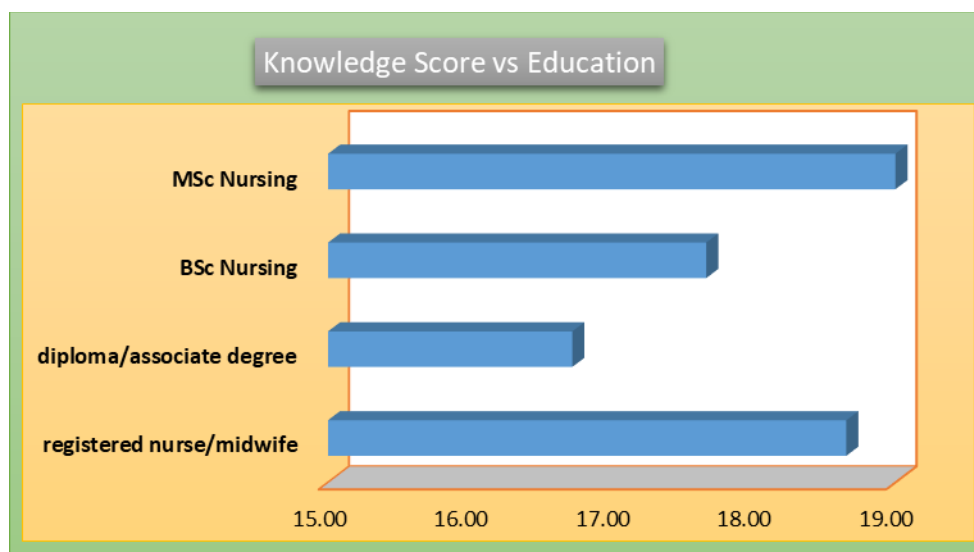
mandatory prerequisite for treating MRSA infections. Improper hand hygiene was identified as a barrier to compliance for MRSA prevention and control measures.

**Objective 3: To correlate the knowledge of staff nurses while adapting practices regarding MRSA infection control prevention and selected social demographic variables.**

In order to find any association independent t tests were conducted. Tests show that there is no significant difference between the genders of nurses and knowledge score on MRSA.

However when further analysis was conducted regarding place of work for staff nurses, this revealed significant difference as P value is less than 0.05. Staff nurses who work within the surgical wards have a better overall knowledge of MRSA, in comparison to the staff nurses working in medical wards. This is in stark contrast to the fact that the majority of patients with MRSA would be admitted for hospital care within medical ward areas.

Figure 2 represents the association between education and knowledge score on MRSA. ANOVA was computed. The results revealed that there was a significant association between level of education with staff nurses and knowledge score on MRSA. Highest scores were reported where staff nurses' education are within the registered nurses/ midwife and MSc Nursing groups.



**Figure 2:-** Horizontal bar graph showing knowledge score vs education

Tests were conducted to verify association between staff knowledge scores and the influence of an infection control nurse who had visited ward areas. Comparisons are made in terms of the frequency of visits by the infection control nurse. There is a significant difference between staff nurses' knowledge score and the frequency of visits from the infection control nurse on the ward, as p value is less than 0.05. The staff nurses scores were higher on the wards where the infection control nurse visited every three days when compared to the wards where infection control nurse visited only when contacted.

There was a positive correlation between staff nurses' years of experience in relation to their level of knowledge. Pearson's correlation was utilized where experience in years showed highest correlation. Therefore it can be deduced that the years of experience in nursing positively correlates to an increased knowledge score on MRSA.

**Conclusion:-**

In conclusion the majority of respondents (81.7%), were females. The highest 71.7% of the respondents were Christians with the majority of 45% were of East Indian origin. 43.3% were certified registered nurses which were highest number within the sample of nurses, as compared to MSc Nursing accounting for only 1.7 %.

One other study investigated a cross section of randomly chosen healthcare workers, focused on knowledge regarding MRSA, which reported deficiencies in overall knowledge concerning infection prevention measures of

MRSA (Biboh, 2012). Another study investigated all sections of healthcare workers, using both survey and actual observation of clinical nursing practices. Noted were deficiencies in knowledge scores and clinical practices especially hand washing, even though participants rated themselves highly for adherence to prevention measures (DeVoe, 2014).

One startling similarity of these previous two studies and this present research displayed that many nurses and healthcare professionals scored adequately to the basic knowledge of MRSA, but were inconsistent in their clinical practice adaptation regarding infection control for MRSA.

A few demographic variables used in this study did correlate to having positive association with an increased level of knowledge for MRSA, among staff nurses. These include nurses' with a higher level of education, nurses' who had more years of professional experience, nurses who had more contact with the infection control nurse and nurses who worked in surgical wards.

### Recommendations:-

Many recommendation were made viz,

- ❖ Establishing a uniform infection control policy specific for MRSA, which is available to all staff nurses in clinical practice. It is important that this policy be updated regularly.
- ❖ Mandatory staff development programs for ongoing education of nurses on infection control measures and MRSA. Accordingly further research projects is warranted on knowledge and barriers to practice for MRSA, using a wider population.
- ❖ The infection control team nurses within the hospital can incorporate a wider group where one nurse from each ward becomes the link to the hospital infection control team. This can verify further liaison with the infection control department.

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