KNOWLEDGE, ATTITUDE, AND PRACTICE OF STANDARD AND TRANSMISSION-BASED PRECAUTIONS OF DOCTORS AND NURSES IN TERTIARY AND SECONDARY HEALTH CARE SETTINGS OF MALDIVES

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ABSTRACT: Compliance with infection control practices relating to health care associated infections is a major public health concern. The aim of this study was to assess the level of knowledge, attitude, and practice of standard and transmission-based precautions among doctors and nurses in secondary and tertiary health care settings of Maldives. This was a cross-sectional survey conducted in 2008. A self-administered questionnaire used was based on different components of standard and transmission-based precautions. Participants from three different health care settings included 70 doctors and 124 nurses. Each health care facility was observed for standard and transmission-based precautions practice. The analysis of correlation between 'attitude' and 'practice' discovered a direct significant association at the level 0.01 (r=.412). No significant correlation between knowledge and practice was found (r= -.001), however the relationship tend to be negative. A marginally significant association was found between training precautions practices with a p value of 0.92. The significant association also was found with 'marital status' and 'practice' with a p value of 0.002. Based on the observed inference standard and transmission-based precaution was not optimum in the 3 hospitals surveyed. Improved performance of practice associated with better 'attitude' is quite plausible. The weak negative correlation found between knowledge and practice signifies that increase in knowledge decreased performance of practice. This does not mean that knowledge does not play a role in practice. There might be other factors within the individual and at organizational level that may disrupt the application of knowledge in practice. Usually those who are married will have more responsibilities and family conflicts which can affect their work practices. Hence those who stay single can demonstrate better performance.

Keywords: KAP, Standard Precautions, Transmission-Based Precautions, Tertiary and Secondary Care Hospitals.

INTRODUCTION: Basic infection control practices are compulsory precautions for anyone in any health care facility. *Standard precautions consist* of a group of infection control practices required to all patients in spite of suspected or confirmed infectious status in any place where health care is provided[2]. These comprise hand hygiene, use of gloves, gown, mask, eye protection, or face shield. These are essential work practices of basic infection control[1]. *Transmission –based precautions* are of three types. They are contact precautions, droplet precautions, and airborne precautions. Transmission-based precautions are used when route (s) of transmission is (are) not enough to interrupt by standard precautions.[10] Transmission of infectious agents within a health care setting requires three agents; a reservoir, susceptible host, and a mode of transmission. The complex interrelationship between a potential host and an infectious agent produces infection. The mode of transmission may vary by type of organism as some types of organism may be transmitted through more than one route.[10] At any given time 1.4 million people worldwide are estimated to be suffering from an infection acquired in a health facility[10]. Most common forms of

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infections which lead to morbidity and mortality are bactereamia, pneumonia, urinary tract infections, surgical site infections and central or intravenous line infections[9]. In consequence, complications such as critical illnesses, prolonged hospital stays, long-term disability and part of population die. This is a huge financial burden to human resources and health care system [7]. "Health care associated infections are unintended, undesired, and intolerable events".[8] Incidence of hospital acquired infection is expected 5-10 percent in any health care settings[9]. It has been estimated that the risk of health care-associated infection is 2 to 20 times higher in developing countries compared to developed countries[7]. Global agencies put huge efforts to reduce health care associated infection such as development of evidence based protocols, guidelines, educational programs etc. The latest guideline developed in 2007 by CDC is '*Guidelines for Isolation Precautions: Preventing transmission of Infectious in Health care settings'.* Written policies for infection control and prevention should be available, regularly updated and enforced[2]. The first Global Patient Safety Challenge (2005-2006) emerged as 'clean care is safer care' and the core message of this campaign was simple measures saves lives[5]. Furthermore "ensuring the safety of everyone who comes into contact with health services is one of the most important challenges facing health care today"[4].

Based on several studies conducted across nations, numerous factors are associated with poor compliance with infection control practices. A study conducted in 16 health care facilities to assess determinants of healthcare worker's self-reported compliance with infection control procedures have shown a strong correlation between organizational factors and self-reported compliance. But no relationship was found between individual factors[11]. Another study conducted for community hospital-based health care workers identified numerous individual factors associated with poor compliance of infection control practices. In this study 22% of participants believed that applying precaution would interfere with patient care, 14% viewed precautions were not necessary in a specific situation, 14% did not anticipate that they were potential for exposure, 11% accounted for high job demand and need to hurry, 7% due to lack of availability of equipment, 6% of the respondents forgot, 4% thought that patients did not have risk, and 3% said that available equipment was not effective[5]. A study conducted in 57 hospitals of Thailand concerning quality of nosocomial infection control with regard to structure and process indicated inadequate support and co-operation by doctors and nurses[3].

Assessing compliance with infection control measures in any health care setting is vital. No such studies have been conducted in the health care settings of Maldives. This was a cross sectional survey conducted to assess the level of knowledge, attitude, and practice of standard and transmission-based precautions among doctors and nurses in tertiary and secondary health care settings of Maldives.

MATERIALS AND METHODS: The study was conducted from 19th February to 20th March 2008. Three health care facilities were selected by cluster sampling. They were Indira Gandhi Memorial Hospital (IGMH) (250 bed, tertiary government), ADK Hospital (50 bed, tertiary private) and Thinadhoo Regional Hospital (50 bed, secondary government). Stratified random sampling was applied to choose the total number of doctors and nurses required. Proportions required for the Thinadhoo regional hospital and ADK hospital were much smaller than IGMH. Therefore the whole census was included from these two hospitals. Sampled population of IGMH, ADK hospital and Thinadhoo Regional hospital include doctors (58.6%, 28.6%, and 12.9% respectively) and nurses (67.4%, 20.5%, and 12.1% respectively). Questionnaires were based on components of standard and transmission-based precautions and were pre-tested in Hithadhoo regional Hospital. Self administered anonymous, 330 questionnaires were distributed and the return rate was 84.03%. A total of 70 doctors and 124 nurses participated in the study. Standard and transmission-based precautions

followed in each hospital, was observed prior 2-3 days of introducing questionnaire to the participants. SPSS was used for analysis.

RESULTS: In the present study one of the socio-demographic characteristics, which showed significant association between standard and transmission-based precautions practice was marital status (p-value, 0.002). Those who stayed single (never married, divorced / widowed) reported better performance in practice. 'Training on infection control practices' was just marginally significant with p-value of 0.09. This indicates that staff who had any form of training on infection control practices was more likely to perform better of practice. Improvement in attitude also enhanced the level of transmission-based precautions practice, for which Pearson correlation was significant at the level 0.001 (r= .412**). No significant correlation between knowledge and practice was found (r= -.001), however the relationship tend to be negative signifying that increase in level of knowledge may decrease the level of performance of practice.

Table 1 Frequencies and percentages of knowledge regarding standard and transmission–based precautions

Institution	Level of Knowledge (%)	
	Low	Moderate to high
Thinadhoo R. Hospital	25 (69.4)	11 (30.6)
ADK Hospital	37 (56.1)	29 (43.9)
IGMH	115 (59.9)	77 (40.1)
Total	177 (60.2)	117 (39.8)

X2 =1.76, P Value = .414

Table 2 Distribution of frequencies and percentages attitude towards standard and transmission – based precautions

Institution	Level of Attitude (%)	
	Negative	Neutral to Positive
Thinadhoo R. Hospital	4 (11.4)	31 (88.6)
ADK Hospital	2 (3.0)	64 (97.0)
IGMH	27 (14.1)	165 (85.9)
Total	33 (11.3)	260 (88.7)

X2 =5.98, P Value = .050

Table 3 Frequencies and percentages of standard and transmission-based practice

Institution	Level of practice (%)	
	Low	Moderate to High
Thinadhoo R Hospital	3 (8.8)	31 (91.2)
ADK Hospital	7 (10.6)	59 (89.4)
IGMH	19 (9.9)	173 (90.1)
Total	29 (9.9)	263 (90.1)

X2 =.081, P Value = .096

As shown in the above tables Majority of the participants (60.2%) had 'low' level of knowledge 'neutral to negative attitude' (88.7%) and 'moderate to high level of practice' (90.1%). The highest level of attitude (97.0%) was reported by the ADK Hospital with a significant association (p = 0.05). This notifies that the attitude shown by the staff of this hospital towards standard and transmission based precautions was better than the other two institutions.

Based on observational inference, practices followed at IGMH were better than the other two hospitals with an infection control team and a better organized working environment. Infection control team, infection control protocols and guidelines along with better facilities were available in this hospital. The most distinguishing feature observed was more frequent hand disinfection by doctors and nurses in this hospital. Several bottles of hand rubs were kept in easily accessible locations. This facility was lacking in the other two hospitals.

DISCUSSION: Based on the self-reported question-naire, knowledge is lower than attitude and practice regarding standard and transmission-based precautions. The tendency that signified increase in knowledge may decrease performance of practice does not necessarily mean that knowledge does not play a role in practice. Reflecting back to several other studies, there are other factors at individual and organizational level that might disrupt compliance with infection control practices. Furthermore regular updating of knowledge regarding

infection control practices is essential for anyone in any position. Although the association between training on infection control practices and standard and transmission-based precautions is marginally significant, this implies that performance of trained staff is better than those who did not have any form of training on infection control practices, which is true. The finding that revealed better performance along with 'positive attitude' is quite plausible. The fact that those who are single could show a better performance is coherent. Usually married people will have family conflicts and other responsibilities which may affect their work practices.

However looking into observational findings, standard and transmission-based precautions were only partially followed in all three health care facilities surveyed. Activities from development of policies to staff education and motivation are required to implement and sustain standard and transmission-based precautions practices according to updated guidelines.

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ความรู้ เจตคติ และการปฏิบัติ ในการระวังการติดเชื้อ สำหรับแพทย์และพยาบาลในสถานพยาบาลทุติยภูมิและตติยภูมิ ในประเทศมัลดีฟ

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บทคัดย่อ: การควบคุมการติดเชื้อในเวชปฏิบัติ นับว่าเป็นสิ่งสำคัญในวงการสาธารณสุข การศึกษานี้มีวัตถุประสงค์เพื่อที่จะประเมินระดับของความรู้ เจตคติ และแนวทางการปฏิบัติ ในการระวังการติดเชื้อในการปฏิบัติงานของแพทย์และพยาบาลในโรงพยาบาลทุติยภูมิ และตติยภูมิ ในประเทศมัลดีฟ โดยทำการศึกษาแพทย์จำนวน 70 คน และพยาบาลจำนวน 124 คน จากการศึกษาพบว่า มีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติ ระหว่างเจตคติและแนวทางการปฏิบัติ ไม่พบว่ามีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติระหว่างความรู้และแนวทางปฏิบัติ ปัจจัยอื่นที่พบว่ามีความสัมพันธ์กันคือ สถานภาพสมรส และแนวทางการปฏิบัติ จากการสังเกตในการศึกษานี้พบว่า มีโรงพยาบาล 3 แห่ง ที่ไม่ได้มาตรฐานในการปฏิบัติการระวังการติดเชื้อ อย่างไรก็ตาม การให้ความรู้ในการระวังการติดเชื้อในทางปฏิบัติก็ยังมีความสำคัญ แม้จะพบว่าไม่มีความสัมพันธ์กับการปฏิบัติ เนื่องจากอาจมีปัจจัยอื่นภายในตนเองหรือองค์กรที่ทำให้ไม่สามารถนำความรู้มาสู่การปฏิบัติได้

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