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A Cross Sectional Study On Knowledge, Attitude And Practice (KAP) Regarding Infection Control Measures Among Year 4 Medical Students Of University Of Cyberjaya (Uoc).

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ABSTRACT

Thiscross-sectional study is conducted among medical students with the rationale that they are the primitive generation of future medical personnel who will serve in hospitals. Hence, assessing them is vital to ensure realisation of their status of knowledge, attitude, and practice in relation to healthcare associated infections which could impact in a positive change during their transition from student years to working era. Clinical medical students were assessed through an online questionnaire regarding knowledge, attitude, and practice of infection control measures as well its associations to each other. This study also evaluates the association of gender and age with knowledge, attitude, and practice of infection control measures.

Keywords: Knowledge Attitude Practice; Infection Control; Medical Students.

INTRODUCTION

Healthcare associated infections (HAIs), previously known as nosocomial infections are infections acquired by patients receiving healthcare. This includes settings that include hospitals as well as others such as long-term care, home care and even ambulatory care (Collins, 2008). HAIs also include infections that appear after getting discharged and occupational infections among healthcare workers (WHO, 2020). Types of healthcare-associated infections (HAIs) include central line-associated bloodstream infections, catheter-associated urinary tract infections, and ventilator-associated pneumonia as well as surgical site infections (SSI). (CDC, 2014). Invasive devices or procedures, hospital factors such as ward and length of stay (LOS), diagnosis upon admission, and patient's age as possible risk factors in developing HAIs. Pseudomonas aeruginosa, Klebsiella species, and Acinetobacter baumanniare identified as the commonest microorganisms responsible for overall HAIs (Ling et al., 2015).

According to the CDC, around 1 out of 31 hospitalised patients in the United States (U.S) has at least one HAI in 2015. The same source estimated 687,000 cases of HAIs in acute care hospitals in 2015. Among the aforementioned cases, 72,000 patients with HAIs died during their hospitalizations. (CDC, 2020). A systematic review and meta-analysis done among Southeast Asian countries between 2000 and 2012, records pooled prevalence of HAI to be 9.0% (95% confidence interval [CI], 7.2%–10.8%) with incidence density of 20 cases per 1,000 intensive care unit (ICU) days (Ling et al., 2015).

There are no national surveys or data on HAIs recorded in Malaysia and even Southeast Asian countries as a whole. However, a prospective cohort study done in 3 hospitals in Malaysia records incidence of ICU-acquired device-related nosocomial infection of 29.3 %. Specifically, the incidence of Ventilator Associated Pneumonia is 27% (N= 215). (Katherason et al., 2009). In the Policies and Procedure on Infection Control, a manual for effective infection control, produced by the Ministry of Health Malaysia (2010), have also recognized the respiratory tract infections to be in the three most common HAIs within the hospitals of Malaysia.

HAIs poses a lot of challenges in healthcare delivery;thus, stringent preventive measures need to be implemented effectively to reduce incidence rate. Infection prevention and control (IPC) is a scientific approach and practical solution designed to prevent harm caused by infection to patients and health workers. It involves few technical areas such as hand hygiene, prevention of SSI, and other types of infections prevention and needlestick injury prevention. (WHO, 2018). These measures, especially proper hygiene, handling of medical equipment, sterilisation techniques and uses of personal protective equipment (PPE) are well advocated in hospitals in Malaysia.

Medical students are exposed early to clinical settings and are at higher risk of transmitting and acquiring HAIs. Considering all these issues, this research is undertaken among medical students of University of Cyberjaya to assess their level of knowledge, attitude and practice of infection control and measures. The reason why this study is conducted among medical students is that they are the primitive generation of future medical personnel's who will serve in hospitals. Assessing their awareness is vital to ensure realisation of their status of knowledge, attitude, and practice in relation to HAIs which could impact in a positive change during their transition from student years to working era.

METHOD

Data collection

A cross-sectional descriptive study using the knowledge, attitude and practice (KAP) self-reported online questionnaire involving Year 4 medical students of University of Cyberjaya with a passing score of 50% through a self-reported questionnaire excerpt from research done by Sugathan et al. (2018) which was designed from previous study containing 32 questions with 82 possible answers to evaluate Year 4 medical students' knowledge, attitude and practice on infection control measures. Approval from the author was obtained via official letter through email.

Data analysis

The answers are classified into knowledge, attitude, and practice, and analysed with Statistical Package for the Social Sciences (SPSS). Hence, the chi-square method was used to analyse the association of the knowledge, attitude, and practice of levels on infection control.

Ethics approval

All the necessary approvals for carrying out the research has been obtained by the University of Cyberjaya (UoC) Research Ethics Review Committee (CRERC). One such issue was informed consent; it seeks to protect the rights of autonomous individuals through one's own decision. It is also to prevent assaults on the integrity of the responders and protect personal liberty and veracity (Clarke J, 1991). A written format explaining the purpose of the research was prepared before filling the online questionnaire.

RESULTS

The knowledge, attitude, and practice of infection control among year 4 medical students of University of Cyberjaya was evaluated in this study. The sample consisted of 68.9% female students compared to the male gender (31.3%) and 23-25 years of age category (Table 1). The most common source of information was lecturers (97.8%) followed by hospital staff (94.4%) and the internet (78.9%) (Table 2).

Table 1: Demographic information.

Demographic information	Total, n	Percentage, %
Gender		
Male	28	31.1

Female	62	68.9
Total	101	100
Age		
20-22	8	8.9
23-25	81	89.9
26-29	1	1.2
Total	101	100

Table 2: Sources of information about infection control measures.

Source	**Yes**	**No**
	No. (% of total)	No. (% of total)
Lecturers	88(97.8)	2(2.2)
Hospital Staffs	85(94.4)	5(5.6)
Friends	41(45.6)	49(54.4)
Family	24(26.7)	66(73.3)
Internet	71(78.9)	19(21.1)
Flyers	23(25.6)	67(74.4)
Posters	49(54.4)	41(45.6)

Overall knowledge level was assessed based on the median score, showing that 93.3% of students were having higher levels of knowledge. Attitude levels of infection control measurements were good among all the study participants regarding most of the areas of infection control (Table 3).

Table 3: Knowledge on infection control.

Knowledge Questions	Correct No. (%)	Incorrect No. (%)
Is it important to prevent cross-infection in health care settings?	90(100)	0(0)
Standard precautions of infection control in protecting patients, health workers and visitors.		
● hand hygiene	90(100)	0(0)
● use of personal protective equipment when handling blood, body organs, specimens, body fluids, excretions and secretions	89(98.9)	1(1.1)
● appropriate handling of patient care equipment and soiled linen	78(86.7)	12(13.3)
● prevention of needle-stick /sharp injuries	84(93.3)	6(6.7)
● environmental cleaning and spills-management	87(96.7)	13(3.3)
● appropriate handling of health care wastes / sharps	84(93.3)	6(6.7)
Infection control standard precautions must be applied to all patients at all times, regardless of diagnosis or infectious status.	90(100)	0(0)
Appropriate hand washing can minimize cross infection with microorganisms	90(100)	0(0)
Using tap water only is enough for hand washing	81(90.0)	9(10.0)
Using plain soap, antimicrobial agents such as an alcoholic hand-rub or waterless antiseptic agent is essential in hand hygiene	86(95.6)	4(4.4)

Using personal protective equipment does not provide a physical barrier between micro-organisms and the wearer.	86(95.6)	4(4.4)
The usage of protective equipment will protect (patients, healthcare workers, and visitor) from getting cross-infections.	60(66.7)	30(33.3)
Personal protective equipment reduces but does not completely eliminate the risk of acquiring infection.	86(95.6)	4(4.4)
Sharps must be appropriately disinfected and/or destroyed as per the national standards or guidelines.	87(96.7)	3(3.3)
Overall knowledge level (median knowledge score as cut off)	84(93.3)	6(6.7)

Based on data tabulated in table 4 and 5, The attitude regarding use of hand washing was relatively lower compared to other areas of the component where only 50% has good attitude regarding hand washing prior to putting gloves. The overall attitude level was also assessed based on the median score. 100% of students were having good levels of attitude. Attitude levels regarding personal protective equipment were high amongst the students. The practice levels of the participants were also assessed based on the median score and 98.9% of the participants had good practice in infection control measures. (Graph 1)

Table 4: Attitude of study participants on infection control.

Attitude Questions	**Attitude (Frequency)(%)**	
	Good	Poor
I need to use hand wash/hand-sanitizer before wearing gloves	45(50)	45(50)
I need to use hand wash/hand sanitizer immediately after removing gloves.	74(82.2)	16(17.8)

I need to put used needles on the bed, beside the patient before disposing it into sharp bins.	79(87.8)	11(12.2)
I need to change gloves between contacts with different patients.	77(85.6)	13(14.4)
I need to avoid contaminated (used) PPE from contact with surfaces, clothing, or people outside the patient care area.	84(93.3)	6(6.7)
I need to wear protective eyewear/goggles when conducting procedures that are likely to generate splashes of blood, body fluids, secretions or excretions.	71(78.9)	19(21.1)
I need to wear masks when conducting procedures that are likely to generate splashes of blood, body fluids, secretions, and excretions.	84(93.3)	6(6.7)
I need to share PPE with other colleagues.	87(96.7)	3(3.3)
Overall attitude level (median attitude score as cut off)	90(100)	0(0)

Graph 1: Attitude levels regarding infection control measures according to genders of year 4 medical students of University of Cyberjaya.

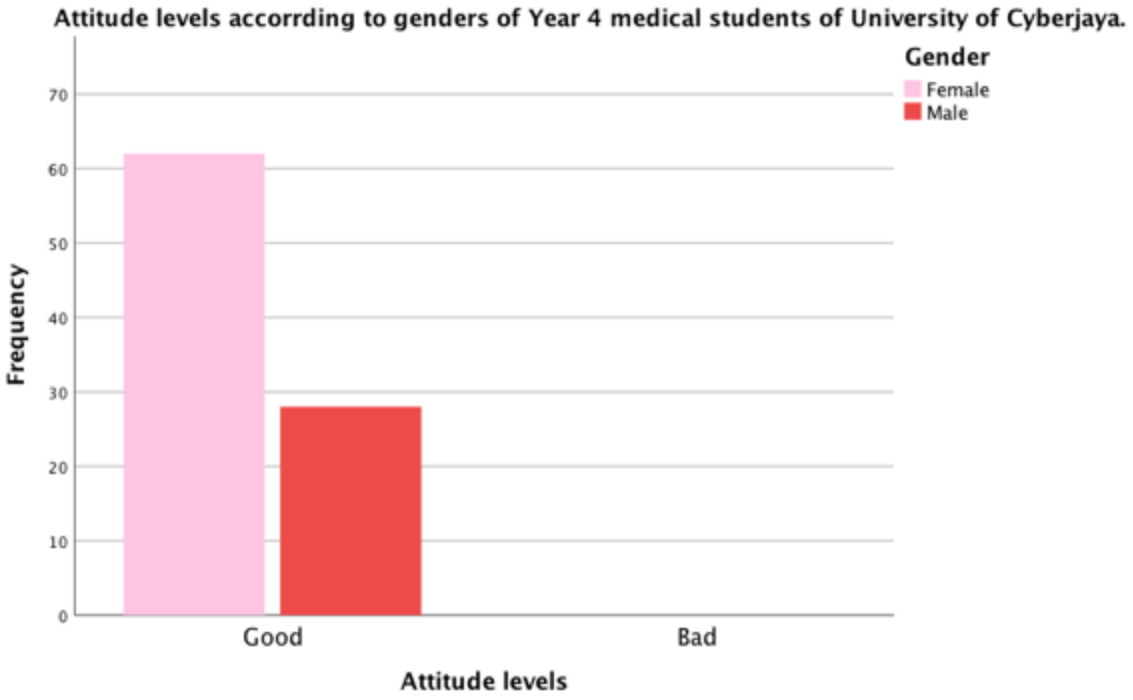

Table 5: Practice of study participants on infection control.

Practice Questions	Answers (Frequency)(%)	
	Correct	Incorrect
Do you practice hand washing using antiseptics/alcohol-based hand wash before and after examining patients?	89(98.9)	1(1.1)
Do you wash your hands immediately after removing gloves?	78(86.7)	12(13.3)
Do you wear gloves while touching blood, body fluids, secretions, excretions or mucous membranes?	89(98.9)	1(1.1)
Do you change gloves between tasks/procedures on the same patient to prevent cross-contamination between different body sites?	69(76.7)	21(23.3)
Do you wear masks to protect mucous membranes of the mouth and	87(96.7)	3(3.3)

nose when undertaking procedures that are likely to generate splashes of blood, body fluids, secretions or excretions?		
Do you wear goggles/eyewear to protect mucous membranes of the eyes when undertaking procedures that are likely to generate splashes of blood, body fluids, secretions or excretions?	54(60)	36(40)
Do you wear a clean gown/apron to prevent soiling of clothes during procedures that are likely to generate splashes of blood, body fluids, secretions or excretions?	86(95.6)	4(4.4)
Do you remove the soiled or wet gown as soon as possible after handling a procedure?	87(96.7)	3(3.3)
Do you wear caps and boot/shoe covers where there is a likelihood that the patient's blood, body fluids, secretions or excretions may splash, spill or leak onto your hair or shoes?	78(86.7)	12(13.3)
Do you re-cap/bend used needles?	75(83.3)	15(16.7)
Do you dispose of the used syringe and needles in the sharp bins?	89(98.9)	1(1.1)
Overall practice level (median practice score as cut off)	89(98.9)	1(1.1)

There was no association between gender (P-value=1.000) and age of medical students (P-value=0.519) with their level of knowledge levels on infection control measures. However, there is an association between gender (P-value=0.031) and age of medical students (P-value=0.034) with their level of practice levels on infection control measures (Table 6). In this study there is no significant association between knowledge levels and practice levels of the year 4 clinical medical students (P-value=0.298) (Table 7).

Table 6: Association of gender and age with awareness, attitude, and practice levels on infection control.

Sociodemographic	Knowledge levels	P value	Practice levels	P value

characteristics	Good No. (%)	Poor No. (%)		Correct No (%)	Incorrect No (%)	
Gender						
Male(n=28)	26(92.9)	2(7.1)	1.000	24(85.7)	4(14.3)	0.031
Female(n=62)	58(93.5)	4(6.5)		61(98.4)	1(1.6)	
Total(n=90)	84(93.3)	6(6.7)		85(94.4)	5(5.6)	
Age						
20-22(n=8)	8(100)	0(0)	0.519	8(100)	0(0)	0.034
23-25(n=81)	75(92.6)	6(7.4)		77(95.1)	4(4.9)	
26-29(n=1)	1(100)	0(0)		0(0)	1(100)	
Total (n=90)	84(93.3)	6(6.7)		85(94.4)	5(5.6)	

Table 7: Association between knowledge, attitude and practice levels on infection control.

Sociodemographic characteristics	Practice levels		P value
	Correct No. (%)	Incorrect No. (%)	
Knowledge level			
Good (n=84)	80(95.2)	4(4.8)	0.298
Poor (n=6)	5(83.3)	1(16.7)	
Total (n=90)	85(94.4)	5(5.6)	

DISCUSSION

Our study was carried among 31.1% male and 68.9% female students (n = 90). Overall, 93.3%, 100% and 98.9% students possess good knowledge, attitude and practice regarding infection control measures, respectively. This is in contrast with the study done by Sugathan and colleagues among clinical year

students in 2018, which shows 66.7%, 57.6% and 51.5% in the respective components. The aforementioned study records the lowest percentage in practice, followed by attitude and knowledge. On the contrary, our study shows that the practice component has a higher percentage than knowledge. Further analysis of our study clearly signifies that there is no association between knowledge and practice levels (P-value > 0.001) as good knowledge does not resemble good practice or vice versa. Meanwhile, the former study revealed a significant association between attitude and practice of infection control measures (P-value < 0.001).

The knowledge component reveals that all the participants know the importance of preventing cross infection, hand hygiene, the application of infection control measures regardless of diagnosis and the benefit of handwashing in minimising cross infection. However, one-third of students do not know the usage ofpersonal protective equipment(PPE) in protecting transmission of cross infections. Meanwhile, all participants possess good attitudes regarding infection control measures in most areas of infection control. 50% of participants have poor attitude on usage of hand sanitiser prior to wearing gloves. This could be due to factors like lack of exposure in the specific area, misconception or student's apathy during clinical orientation or demonstration in hospitals.

Practice component, on the other hand, is higher than the knowledge component where 98.9% of students are having good practice of infection control measures in most areas. This indicates that students are capable of practicing the measures effectively and fulfill the rationale of the study that aims to assess the realization of their awareness on HAIs. This shows that the majority of them are on the right progress towards adaptation of infection of infection control measures in future. This, in fact, denotes a good indicator in preventing healthcare associated infection in hospitals by the future medical practitioners.

In this study, there is no association between gender and age with the level of knowledge (P-value > 0.001) which is similar to the study by Sugathan et.al. where association between gender and knowledge, attitude and practice are not established (P-value > 0.001). However, the level of practice has been associated with the aforementioned variables in our study (P-value = 0.034).

Comparison among all batches of faculty of medicine could have been done prior as the study sample does not resemble the whole faculty of medicine. The sample population which is done only among year 4 medical students is a limiting factor in this study as it does not resemble the whole clinical year students. Thus, future studies can incorporate them to analyse and compare the KAP components

between different academic years. There are limited KAP studies regarding infection control measures done among medical students locally and in international institutions as the previous studies are revolving around medical practitioners. Hence, future studies could also incorporate comparison between different universities for further analysis on learning environment, methodologies and the relationship with the KAP regarding infection control measures. It is essential to include students in the studies to instillself-realisation regarding infection control measures so that they can implement them during their practice during the working phase in the hospitals.

CONCLUSION

Attitude of year 4 medical students regarding infection control measures in this study is very good. However, attitude solely is not enough to achieve the mainstay rationale of the study whereby knowledge and practice should also be reflected for successful implementation of infection control measures. Thus, this illustrates that knowledge and practical training sessions should be conducted regardinginfection control measures.

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