

Awareness And Practice Of White Coat Hygiene Among Clinical Students In A Malaysian Medical School

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Abstract

Medical students are aware of the importance of maintaining a clean white coat in preventing infection from being spread. This study aims to assess the awareness and practice of good hygiene on the white coat and the association between the awareness and practice on the white coat hygiene. This cross-sectional study was conducted among 133 clinical year students at the University of Cyberjaya, a private medical university in Malaysia. Awareness and practice were assessed using a self-administered questionnaire. This study found most of the clinical students were aware of most of the aspects of whitecoat hygiene. With regards to practice, more than half of the respondents were practising as recommended except for wearing whitecoats at the cafeteria. Most clinical year students still lack effective whitecoat hygiene practice despite a high level of awareness. More effort is needed to encourage medical students to practice a good whitecoat hygiene practice.

Keywords: Awareness; Practice; Medical students; Whitecoat hygiene, Clinical Year

1. INTRODUCTION

Doctors and medical students wear white coats as a symbol of identification among patients, to put their medical equipment and to protect their cloth from the microorganism. However, white coats are shown to be potential transmitting vectors for pathogenic organisms which lead to hospital-acquired infection (Banu, et al., 2012, Mishra et al., 2020; Qaday et al., 2015). According to Muhadi et al, 2007,

medical students are still wearing white coats in unnecessary areas such as in college, cafeteria, library and resting areas even though they have a high level of awareness.

Besides that, the risk of infection can be reduced by practising white coat hygiene. A study reported that an increased count of pathogenic bacteria is associated with a longer duration of wearing (Srinivasan et al., 2007). It was observed that laundering of white coats is low among physicians and students (Melenhorst et al., 2009; Olvera-Lopez et al., 2020). Therefore, the white coats hygiene awareness should be created as early as in medical schools.

This study aims to assess the association between awareness and practice on white coat hygiene among clinical students at the University of Cyberjaya. The University of Cyberjaya is located in Sepang district, Selangor, Malaysia. The medical program in the university is a 5-year program that is divided into the basic medical sciences phase (Year 1 and 2) and clinical sciences phase (Year 3, 4 and 5). The clinical year students are divided into small groups based on clinical posting.

2. METHOD

This cross-sectional study was done among clinical year students of the medical program at the University of Cyberjaya. Cluster sampling was done by selecting the group randomly, then all students in the selected group were invited to become the respondents.

A self-administered questionnaire was used to obtain the data. With regards to the content and scope of the questionnaire, an extensive literature review was done to ensure the content of the questionnaire was appropriately developed. The questions were also adapted and adopted from previous studies done by (Sande, 2015) and (Jayarajah et al., 2019). There were three sections in the questionnaire which consisted of sociodemographic, 15 questions on awareness (A1 to A15) of whitecoat hygiene and 6 questions (P1 to P6) on the practice of whitecoat hygiene. It was pretested among ten students to ensure face validity. A five-point Likert scale was used to assess the awareness and practice, which were 'strongly disagree', 'disagree', 'slightly agree', 'agree' and 'strongly agree', and finally, it was categorized into 'disagree' and 'agree'.

Each item of the questionnaire was tabulated in the form of frequency and percentage. Next, Pearson chi-square was performed to determine the association between awareness and practice on white coat hygiene. This study was given ethics approval by the University of Cyberjaya Ethics Review Committee (CUCMS/CRERC/ER/218)

3. RESULTS

Sociodemographic data

This questionnaire was distributed and answered by 133 respondents resulting in the response rate of this survey being 84 %.

Table 1: General sociodemographic data of respondents

Sociodemographic factor	Frequency (No.)	Percentage (%)
Gender		
Male	41	30.8
Female	92	69.2
Race		
Malay	119	89.5
Chinese	6	4.5
Indian	7	5.2
Others	1	0.8
Year of study		
Year 3	49	36.8
Year 4	46	34.6
Year 5	38	28.6
Total	133	100.0

Most of the respondents were female, Malays and Year 3 which were 69.2%, 89.5%, and 36.8% respectively.

Awareness of white coat hygiene

More than 96% of the students agreed on the daily cleaning of their white coats and their clothes worn if they had contact with the patient. Most of them also agreed on the recommendation of cleaning the white coat at least once a week during their clinical posting which was at 94% as stated in Table 2.

With regards to the awareness of the whitecoat as a vehicle for microbes' transmission, almost all students agreed that white coats harbour harmful pathogens and could carry germs. Nevertheless, 14% of the respondents agreed to keep the white coat on when consuming meals.

Most of the respondents agreed on the recommendation of using hot water and spending at least 10 minutes (home laundering) to clean the white coat with the proportion of 93%, and 96% respectively. However, only 20% disagreed on the use of normal soap (20%) and agreed that hand washing was ineffective (61%). Sixteen percent of the students who disagreed on the washed white coat should not be transported in the same bag.

Table 2 Awareness on Whitecoat Hygiene among the Respondents (n=133)

No.	Awareness on white coat hygiene	Agree No. (%)	Disagree No. (%)
Whitecoat or attire cleaning			
A1	It is recommended to clean the white coat daily during clinical appointments.	127 (96)	6 (4)
A2	It is recommended to clean white coat at least once a week during clinical posting.	125 (94)	8 (6)
A3	Any clothes worn that come into contact with the patient should be laundered after daily use.	129 (97)	4 (3)
Awareness of the whitecoat as a vehicle for microbes' transmission			
A4	It is advisable to keep the white coat on when consuming meals.	18 (14)	115 (86)
A5	White coat is known to harbour harmful pathogens	131 (99)	2 (1)
A6	Wearing white coat during travel, in canteens, hostel rooms or homes should be prohibited.	124 (93)	9 (7)
A7	White coat is may be contaminated even though it has no stains.	131 (99)	2 (1)
A8	White coat can carry germs.	133 (100)	0 (0)
Laundry			
A9	It is acceptable to use normal soap to clean the white coat.	106 (80)	27 (20)
A10	Hand washed clothing items is ineffective.	81 (61)	52 (39)
A11	It is recommended that home laundering should use hot water.	123 (93)	10 (7)
A12	Home laundering wash cycle should be at least 10 minutes.	127 (96)	6 (4)
A13	Cycle in the dryer or ironing after wash gives extra heat that encourages further thermal disinfection.	126 (95)	7 (5)
A14	White coats washed at home should not be transported in the	112 (84)	21 (16)

	same bag.		
A15	Heavily soiled white coat should wash separately to avoid cross contamination.	129 (97)	4 (3)

Practice maintaining white coat hygiene

With regards to the laundry, more than half of the students cleaned their white coats daily during clinical appointments (51%). Most of them were using normal soap and hot water to clean it with the percentage of 86% and 59% respectively (Table 3).

On the subject of whitecoat wearing, a total of 32 students (24%) did not take off their whitecoat every time before leaving the ward. Meanwhile, about 47% of them were wearing white coats at the cafeteria occasionally. Lastly, about 67% of the students had more than one white coat.

Table 3 Practice to Maintain White Coat Hygiene

No.	Practice to maintain white coat hygiene	Agree No. (%)	Disagree No. (%)
P1	I clean my white coat daily during clinical appointment	68 (51)	65 (49)
P2	I am using normal soap to clean my whitecoat	114 (86)	19 (14)
P3	I use hot water to clean my white coat	79 (59)	54 (41)
P4	I always take off white coat before leaving the ward	101 (76)	32 (24)
P5	I sometimes wear whitecoat at cafeteria	63 (47)	70 (53)
P6	I only have one whitecoat	44 (33)	89 (67)

Table 4 showed the summary of the chi-square test to determine the association between awareness and practice for certain aspects. Among students who agreed to clean the white coat daily during clinical appointments, 47% of them did not practice it. Next, out of 27 students who did not use normal soap to clean their white coats, 41% (n=11) used it for cleaning the coat instead. The p-value was less than 0.05 indicates the awareness of the normal soap usage was associated with its practice.

About 61% of the students did not use hot water even though they agreed with the recommendation of hot water usage. Only 52% of students who agreed with the prohibition of wearing white coats outside the ward applied for it. Last but not least, there were 53% of the students wearing white coats during meals even though they knew that it was inadvisable to keep the white coat on when consuming meals.

Table 4: Association between Awareness and Practice on White Coat Hygiene

Awareness	Practice		Total	P-value
	Agree	Disagree		
Daily cleaning (A1 vs P1)	67 (53)	60 (47)	127	0.084*
Normal soap (A9 vs P2)	16 (59)	11 (41)	27	<0.001
Using hot water (A11 vs P3)	48 (39)	75 (61)	123	0.194
Wearing white coat outside ward (A6 vs P4)	64 (52)	60 (48)	124	0.382
Wearing white coat during meal (A4 vs P5)	54 (47)	61 (53)	115	0.810

*Fisher's exact test

4. DISCUSSION

In this study, almost all respondents agree that the white coat is known to harbour harmful pathogens and white coats can carry germs (99% and 100% respectively). A research done by Pandey, et al. in 2010 which shows 66% of the pens, 55% of the stethoscopes, 47.61% of the cell phones and 28.46% of the white coats used by the doctors were colonized with various microorganisms.

Approximately 53% practice daily cleaning, 59% practice using normal soap for white coat cleaning, 39% practice using hot water to clean the whitecoat, 48% practice wearing a white coat outside the ward and 53% practice wearing a white coat during a meal. According to Muhadi (2007) students wore white coats in the cafeteria and other places. It was not unusual to see white coats placed on chairs or carried outside the hospital premises.

We found that most clinical year students are aware of whitecoat hygiene, but they do not practice it to maintain whitecoat hygiene. For example, a percentage of 96% of the respondents do acknowledge cleaning their white coats daily during clinical appointments, however, only 51% of the respondents practice it. According to Bearman et al, (2014) any apparel worn at the bedside that comes into contact with the patient or patient environment should be laundered after daily use. The same research also stated that white coats worn during patient care should be laundered no less frequently than once a week and when visibly soiled.

The majority of the respondents used hot water to do their home laundering and have them cycled in the dryer or ironing after washing to give extra heat that encourages further thermal disinfection (93% and 95% respectively) but only minimal percentages applied it. We should encourage

more in this regard among students. Bearman, et al., (2014) reported that a home laundered white coat in a hot-water wash cycle (ideally with bleach) followed by a cycle in the dryer is preferable.

Regarding the practice side in handling the white coat, 67% of the respondents agree that they have more than one white coat. This is also agreed by Bearman in his research in 2014 saying that health care professionals engaged in direct patient care including house staff and students. Another research by Banu et al. (2012), suggested the annual purchase of white coats and the ownership of two or more white coats should be made compulsory.

Awareness alone is not enough, proper rules and regulations starting from the university should be done to discipline the students. This can help clinical year students to practice maintaining the hygienic level of the whitecoat to avoid cross-contamination. It can also prevent the clinical year students from continuing the habit until they become a doctor.

5. CONCLUSION

Most of the clinical students at the University of Cyberjaya were aware of white coat hygiene but the practice of white coats hygiene was low. Education programs can be conducted to create awareness on the importance of white coat hygiene and providing proper guidelines of white hygiene may help to reduce the incidence of hospital-acquired infections among students.

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