IeJSME 2023 17 (1): 09-18

A Cross-Sectional Study on the Knowledge, Attitude and Practice of Hand Hygiene among Adults in the Chowrasta Market, Penang

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Background

The community plays a crucial role in practising effective hand hygiene to prevent disease transmission. Several studies conducted on hand hygiene practices among healthcare practitioners show positive outcomes in decreasing disease transmission particularly during the COVID-19 pandemic. However, studies related to hand hygiene among adults in the local communities are scant.

Aim

This study aimed to determine 1) the level of knowledge, attitude, and practice of hand hygiene, and 2) the relationship between demographic factors and hand hygiene practice among adults in a local community in Penang.

Methods

This was a cross-sectional quantitative survey combined with direct observation of hand hygiene practice. A self-administered questionnaire on knowledge and attitude towards hand hygiene, and an observational checklist of hand hygiene practice were adapted to measure the variables studied. Non-random quota sampling technique was used to recruit the required 398 sample size.

Results

The study found that the level of knowledge using an internationally commonly used 12 item questionnaire was good. Attitude towards hand hygiene measured on another 7 item questionnaire was also good. A majority of the participants (73.9%) had a good level of hand hygiene practice. No significant relationship was found between age, gender, level of education, and hand hygiene practice.

Conclusion

Local health authorities are urged to continue to emphasise to the public on the importance of hand hygiene to reduce disease transmission in the community. Further studies are recommended to explore the possible barriers that hinder people from adopting good hand hygiene practice.

Keywords: *adults, attitude, hand hygiene, knowledge, practice*

Introduction

Hand hygiene is fundamental to prevent transmission of infections. Effective hand hygiene is defined as the action of washing hands with soap and water or using an alcohol-based hand rub antiseptic solution to minimise the growth of microorganism or pathogens.[1] Adhering to effective hand hygiene practices is highly emphasised during the COVID-19 pandemic outbreak.[2] In addition, World Health Organization stresses the importance of engaging public on proper hand hygiene as one of the strategies to prevent the spread of coronavirus in the community.[1]

The Ministry of Health Malaysia recorded a total of 4,848,314 cumulative case of COVID-19 in Malaysia as of October 2022.[3] Similar to countries such as United States, India and Brazil, the coronavirus infected millions within our local communities in the last three years. The outbreak of hand-foot-mouth

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disease within this country was at a record high of 22,463 cases; 12.8 times higher when compared to the previous year.[4] Communicable diseases will remain a public health concern from time to time, even if there are periods of calm in between storms.

Hand hygiene is one measure to combat such transmissible diseases. There are standard operation procedures on infection control by the Ministry of Health but may still be a gap in the knowledge, attitude, and practice of proper hand hygiene in the community. Chowrasta market is one of the large marketplaces in Penang Island. Visitors, representing the diverse populations in Penang, come from various socio backgrounds and ethnic groups. Prior to the Covid-19 pandemic outbreak, Penang Island received more than 20 million domestic and international tourists from January to March 2019.[5] There is a high potential risk of direct transmission of diseases in the community, through poor hand hygiene.

Based on the past literature review, there are many studies related to hand hygiene. However, these studies show inconsistent findings in different contexts. There is limited study on hand hygiene among the public in Malaysia. Most of the studies were focused on healthcare providers or students, and much less on adult residents in the community. Researchers in a past study reported that most healthcare professionals have good level of knowledge on hand hygiene.[6] This is consistent with a systematic review on studies published between 2015 and 2019 where its findings revealed that nurses had the highest hand hygiene practice (80%; 95% CI:74%-87%) among other healthcare providers.[7] However, in Khartoum, Sudan, Yousif and colleagues reported that only 35.6% of the healthcare providers achieved a satisfactory knowledge level on hand hygiene.[8] Undergraduate students (80.4%) however, were found to have poorer knowledge and were not able to perform all the essential steps of hand hygiene.[9] Hussain discovered that healthcare workers had a high level of knowledge but poor level of hand hygiene practice.[10]

With regard to hand hygiene attitude, Yousif and colleagues found a majority of the healthcare providers showed a negative attitude towards hand hygiene practice due to time constraint.[8] However, another study revealed that 77% Indonesians had positive attitude towards hand washing practice during COVID-19.[11] Among the participants, 95.4% reported their intentions to practise hand washing even after the pandemic. Eshetu and colleagues discovered that more than half of the school children exhibited a positive attitude towards hand hygiene practice.[12] They found no significant association between demographic factors and attitude towards hand hygiene. Nuwagaba *et al.* reported a significant relationship between level of attitude and knowledge of hand hygiene practice among the university students.[9]

This study, therefore, aimed to address gaps by determining 1) the level of knowledge, attitude, and practice on hand hygiene and 2) the relationship between demographic factors (age, gender, education level) and practice on hand hygiene in a local community in Malaysia. The outcome of this study will leverage on the importance of hand hygiene in the public. Hand hygiene should become a daily activity that is imperative in maintaining public health. It is essential to focus not only on healthcare providers but also on adults in the community.

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Research Model

The conceptual framework of this study was guided by the theory of Planned Behavior.[13] Accordingly, the intention to execute a behaviour is determined by attitude, subjective norms, and perceived behavioural control of an individual. The stronger the intention on a behaviour, the better the likelihood of the person to perform the task. It is believed that an intention to act by an individual is related to his/her level of knowledge and attitude towards a course of action.

The aim of this study was to measure the knowledge, attitude and practice of hand hygiene and its relationship to demographic factors. We defined knowledge operationally as the level of understanding about good hand hygiene practice and diseases transmitted due to poor hand hygiene and attitude referred to behaviour towards hand hygiene practice. Knowledge and attitude were measured using a questionnaire. Practice referred to the action of performing hand hygiene using the 5-step alcohol hand rub technique with a sufficient amount of alcohol sanitizer and time spent for hand rub recommended by the Ministry of Health Malaysia.[14]

Methods

This cross-sectional quantitative survey employed a self-administered questionnaire to examine the level of knowledge and attitude on hand hygiene; and an observational method to determine hand hygiene practices among adults visiting the Chowrasta market in Penang, Malaysia.

Based on the data obtained from the Operation Executive, Chowrasta market, the sample population consists of 6000 Malaysian adults every week on average. With this, the targeted sample size required was 398 based on Raosoft software calculator, with 5% margin error, 95% confidence interval, 50% distribution rate and 10% attrition rate. A non-probability quota sampling method based on ethnics (46.3% Malay, 43.2% Chinese, 10.5% Indian) was used to recruit the participants according to the proportion of three main ethnics in Penang, Malaysia.[15] The sample size required for Malay, Chinese, Indian was 184, 172 and 42, respectively.

The instrument consisted of four sections. Section A was demographic data consisting of age, race, gender education level and job status. Section B, a 12-items questionnaire using "true" and "false" scoring system was adapted from Suen and Rana to measure level of knowledge on hand hygiene.[16] The tool has been validated by a panel of experts from infection control and public health in Switzerland, Australia, Korea, Hong Kong, Taiwan, Singapore and Malaysia. Excellent validity and reliability results were reported in past studies using the instrument, the outcomes of which offer valuable information to enhance hand hygiene practice and public health.[16-18] There are two components in the instrument: types of disease transmitted by poor hand hygiene (7 items), and statements related to proper hand hygiene practice (5 items). One mark was awarded to each correct answer and zero mark for incorrect answer, with total scores ranging from 0-12. Score of 9-12 indicated good knowledge, 6-8 moderate knowledge and 0-5 poor knowledge on hand hygiene.

Section C was another questionnaire that was adapted from Rosen and colleagues to measure level of attitude towards hand hygiene practice.[19] The tool has been tested and validated, and it created a

sustainable social norm of effective hand washing in various study populations.[20,21] It consists of 7-items using 5-points Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). The higher the score, the higher level of attitude towards hand hygiene practice. Lastly, Section D was a checklist adopted from Malaysia Policy and Procedures on Infection Prevention and Control to observe hand hygiene practice of participants.[14] It consisted of 7-items using "performed" and "not performed" scale based on the 5 steps of alcohol-based hand rub technique (5 items), sufficient amount of alcohol sanitizer (1 item) and time spent (20-30 seconds) recommended for hand rub (1 item). A good hand hygiene practice is considered when an individual practises all the steps of hand hygiene; while poor hand hygiene indicates that a person fails/misses any step of the hand hygiene.

The original instrument is available in English version. For this study, Section A (demographic data), section B (knowledge on hand hygiene) and section C (attitude towards hand hygiene practice) were translated into Bahasa Malaysia. The translation process using forward and backward method involved two bilingual translators who are experts in Bahasa and English. The translated questionnaire was validated by a panel of three content experts. A test and retest approach on 30 samples was used to compare inter-translating items between Bahasa Malaysia and English to ensure the reliability of the instrument in different versions.[22] Reliability values of 0.949 for section B and 0.859 for section C for both test and retest indicated good reliability of the translated instrument for the study.[23] During the pilot study, reliability results obtained for section B (KR-20 of 0.956), section C (Cronbach's Alpha of 0.979) and section D (Intra-class Correlation Coefficient of 0.839) indicated good to excellent internal reliability of the instrument for Bahasa Malaysia and English versions.

Data collection was conducted from October to December in 2020 during the Malaysia Movement Control Order (MCO) period. A restricted number of visitors was allowed at one time, and all visitors were required to clean their hands using alcohol hand rub before entering the market. Participants were approached by the researchers while they were in the queue at the entrance point of the market. The purpose and nature of the study were explained to each participant prior to data collection. Participants who consented for the study were given a numbered sticker and invited to complete the self-administered questionnaire on parts A to C. Each of them was then identified by another researcher using the numbering system in completing part D observation scale. Participants were observed for alcohol hand rub practice from a short distance away from their front view to minimise the Hawthorne effect. No duplicated response was ensured by obtaining self-declaration from the participants. At the end of the survey, a total of 398 samples based on the three ethnic groups responded to the study within the data collection time frame. Participants' information and survey response were secured with password protection, and no names were revealed to maintain their anonymity and confidentiality.

Data was analysed using SPSS software version 26 for descriptive and inferential statistics. Normality test was done in ensuring data had met the assumptions prior to selection of parametric test for this study.

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Ethical approval to conduct this study was obtained from the International Medical University Joint-Committee on Research and Ethics [Project ID: BN1/2020 (PR-49)]. Permission for data collection was also granted by the Assistant Officer of Environmental Health of Penang Town Hall.

Results

A total of 398 people participated in the survey. More than half of the participants were 21-40 years (n=224, 56.3%) followed by >40-60 years (n=161, 40.4%) and >60 years (n=13, 3.3%). Their mean age was at 40±10.1 years. Women accounted for 76.1% of the sample. There were 184 (46.3%) Malays, 172 (43.2%) Chinese and 42 (10.5%) Indians. The majority (52.35%) had secondary school education. Few (4.7%) had only primary level education and 43% had tertiary education.

The overall level of knowledge on hand hygiene among public adults was good with a mean score of 11.78±0.77/12. All participants correctly identified, 7 items, that watery stools, flu-like symptoms, hand-foot-mouth disease, skin ulcers and eye infections could be transmitted with poor hand hygiene and diabetes could not. However, 5% were wrong about human immunodeficiency virus (HIV). Table I shows that more than 93% of the participants indicated their understanding on the statements related to hand rub techniques, use of sanitizer and cleansing effect of water temperature.

Table I: Correct responses to statements on hand hygiene among participants

ITEM	NUMBER	(%)
1. Always keeping my hands clean may lower my body defense mechanism.	385	(96.7)
2. Hands should be held under water while lathering with soap.	384	(96.5)
3. An alcohol-based hand sanitizer that contain 40% alcohol sufficient for hands disinfectant.	393	(98.7)
4. Rubbing my hands until soap forms a lather for 10 seconds before rinsing is enough for hand disinfection.	389	(97.7)
5. Temperature of water makes no difference in terms of the cleansing effect of hand cleaning.	372	(93.5)

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As indicated in Figure I, the overall attitude on hand hygiene practice among participants was good (mean 4.05±0.09/5). Almost all of the participants disagreed and strongly disagreed that practising hand hygiene was inconvenient (99%), frustrating (100%), optional (98.5%), not practical (100%), troublesome (100%), irritating (98.2%) and harmful (100%) to them.

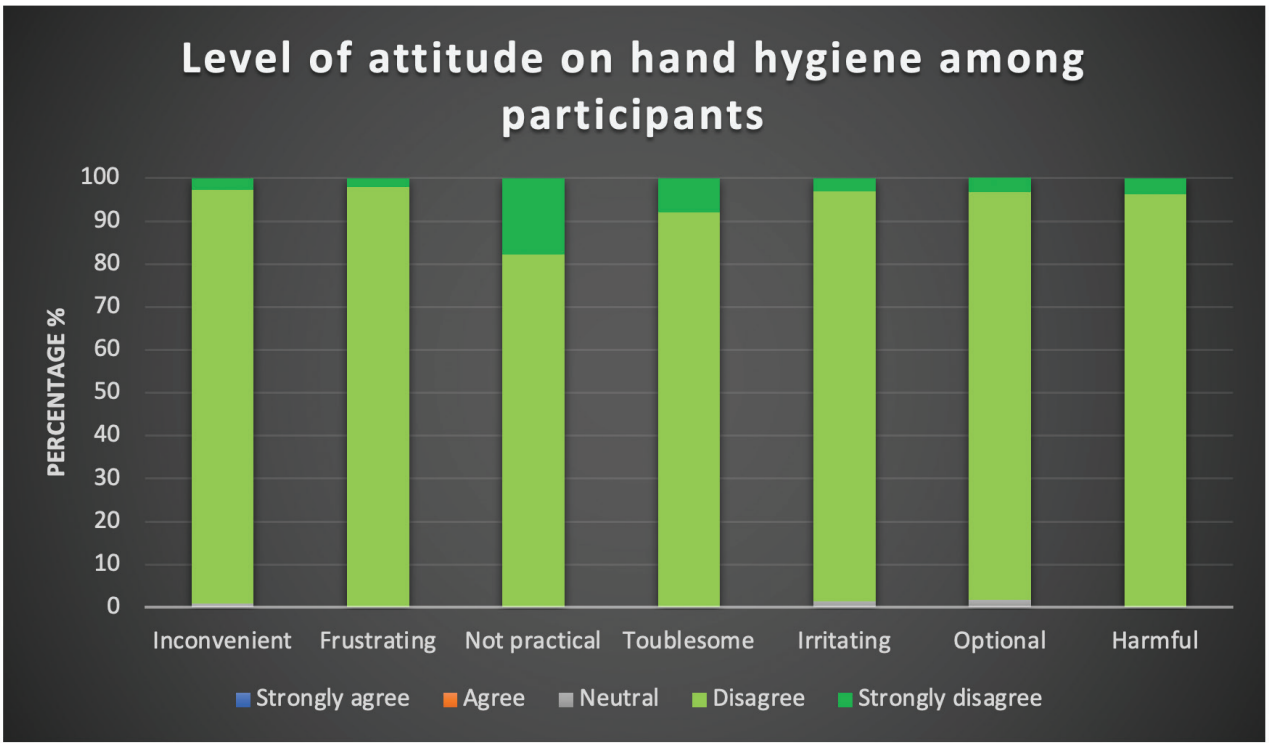

Figure I: Level of attitude on hand hygiene among participants

In relation to hand hygiene practice using hand rub, 73.9% (n=294) of the participants demonstrated a good performance while the rest were judged poor. The majority of the participants adhered to the 5-steps of proper hand rub techniques with sufficient amount of alcohol sanitizer and time required for hand rub. However, a quarter of them missed out one or more steps during the survey.

Relationships among demographic factors with level of hand hygiene practice (good and poor category) was analysed using Pearson Chi-Square. The study showed no significant relationship between age, gender, level of education and hand hygiene practice ($P > .05$) (Table II).

Table II: Relationship between age, gender, level of education and practice on hand hygiene among participants

Variables	*f*	Good hand hygiene practice	Poor hand hygiene practice	Pearson Chi-Square		
		f (%)	*f* (%)	X^2	*df*	*p*-value
Age						
21-40 years	224	162 (72.3)	62 (27.7)	0.956	2	0.620
> 40-60 years	161	123 (76.4)	38 (23.6)			
> 60 years and above	13	9 (69.2)	4 (30.8)			
Gender						
Male	95	72 (75.8)	23 (24.2)	0.238	1	0.625
Female	303	222 (73.3)	81 (26.7)			
Level of education						
Primary	19	12 (63.2)	7 (36.8)	1.969	2	0.374
Secondary	208	151 (72.6)	57 (27.4)			
Tertiary	171	131 (76.6)	40 (23.4)			

*** $p < 0.05$**

Discussion

In this study, the level of knowledge on hand hygiene among the local community was good. This finding is consistent with other studies that reported a good level of hand hygiene knowledge among healthcare workers.[24,25] Although there may be differences in terms of healthcare related knowledge between adults in a market place and healthcare workers, participants in current study demonstrated a good knowledge level on types of disease transmitted by poor hand hygiene, and hand hygiene practice. This may be that a majority of the participants had moderate to good level of academic qualification. Another possible reason may be the accessibility of health-related information through social media and websites. Our study did not find misunderstanding regarding the transmission mode of HIV, noted in a study among Nepalese, who thought it was through poor hand hygiene practices.[16] These may be explained by the differences in level of education and public awareness across the countries.

Good attitude on hand hygiene found in this study is in line with past studies which reported a good attitude towards hand hygiene practice among healthcare workers.[26,27] Good knowledge on hand hygiene explains the good attitude reported in our community. Eshetu and colleagues also reported that the higher the level of knowledge on hand hygiene, the better the attitudes towards hand hygiene practice.[12] It is, therefore, necessary to increase understanding on the types and modes of communicable diseases, its consequences, and standard practice on hand hygiene among communities. The health authorities may plan

a series of health-related campaign and making use of social media to promote public awareness on related topics.

A majority of adults in this study demonstrated good hand hygiene practice using alcohol hand rub. These findings are consistent with past studies that reported good performance of hand rub among healthcare providers.[24,28,29] Natnael and colleagues found that nearly fifty percent of the barbers and beauty salon workers in Ethiopia had poor hand hygiene practice during COVID-19 pandemic.[30] However, our study showed approximately one quarter of the adults in a market place did not adhere to the recommended technique on effective alcohol hand rub. Non-healthcare personnel may not recognise the importance of following the standard practice as they are neither trained nor dealing with the sick people as in the hospital settings. Many people may perceive it as time-consuming to perform all the recommended steps of hand hygiene. Such attitude could have negative influence on proper hand hygiene practice and potentially increase the risk of disease transmission in the community. Dutta and colleagues also indicated that lack of knowledge and negative belief on hand hygiene could negatively impact its good practice.[31] Even though there is increased public awareness on hand hygiene during the COVID-19 pandemic, individuals should continue in keeping up the civic consciousness in order to prevent spreading of microorganisms. Certainly, communicable diseases through direct contact can be minimised with everyone adopting hand hygiene as their habitual practice.

Guzek and colleagues found females performed hand hygiene more frequently than males.[32] But the non-significant relationship regarding demographic factors and level of hand hygiene practice we found is in line with other studies.[9,12,33] The good level of understanding and attitude on hand hygiene may have influence on the practice. This is aligned with the theory of planned behaviour used in the study. In view of the increased number of cases of communicable diseases in the nation, healthcare authorities should continue to further educate the public on its importance to prevent disease transmission through proper hand hygiene practice.

Limitations

The sample participants were limited to local adults visiting a public market and hence this is not generalisable to the Malaysian population. Data was collected during the COVID-19 MCO period where participants may be more adhering to hand hygiene practice. The findings of this study may not reflect the attitude and practice of population in post pandemic era.

Conclusion

The focus on hand hygiene for disease transmission prevention remains prominent in the community. Many studies support that hand hygiene can prevent a wide range of illnesses such as respiratory diseases, hand-foot-mouth disease, and gastrointestinal diseases. The outcomes of this study showed a good level of knowledge, attitude, and practice on quality hand hygiene among local community. The findings suggested that hand hygiene practice may be acquired through good knowledge and behaviour, irrespective of other factors such as age, gender or education.

Long term strategies in enhancing the public health system and for better access to healthcare facilities are required, particularly in the rural areas. Future studies in determining barriers to hand hygiene and associations between knowledge, behaviour and practice will generate new knowledge to public health. A larger sample size from West and East peninsula representing the Malaysian population is also recommended.

Acknowledgements

The authors acknowledge the support provided by International Medical University and the participants who took part in the study.

Funding

The study was approved and funded by the International Medical University Joint-Committee on Research and Ethics [Project ID: BN1/2020 (PR-49)].

Conflict of Interest

None

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