HANDWASHING DETERMINANTS AND PRACTICES AMONG PUBLIC HEALTH STUDENTS IN THAILAND

Apaporn Kitsanapun and Khemika Yamarat

College of Public Health Sciences Bangkok, Thailand.

Correspondence: Apaporn Kitsanapun. Email: akitsanapun@gmail.com

Abstract

Background: Handwashing is an effective way to reduce infectious disease transmission, but health care workers do not always follow hand hygiene guidelines. This research examines handwashing determinants using the Theory of Planned Behavior (TPB) and handwashing practices for public health students in Thailand

Methods: A cross-sectional descriptive study was conducted to assess the handwashing antecedents and behaviors of students attending the Sirindhorn Colleges of Public Health. Volunteer participants (n = 120) completed self-administered structured questionnaires. Data analysis was performed using descriptive statistics to describe the basic characteristics of the collected data in the study.

Results: TPB determinant scores were moderate to high (71% to 85%) and the mean handwashing knowledge score was 74% of the total scores. Handwashing practice rates before food preparation and consumption and after coughing or sneezing average less than 80%.

Conclusion: SCPH students' attitudes toward handwashing are generally favorable and their handwashing rates are high, but they do not consistently adhere to handwashing protocols. Therefore, handwashing practice among SCPH students is room for improvement, with potential interventions targeting beliefs, social factors, and perceived barriers to handwashing.

Keywords: Hand hygiene, hand washing, health care, public health, theory of planned behavior

Introduction

Hand hygiene, which includes handwashing, the use of alcohol-based disinfectants, and changing gloves when examining different areas of a patient's body, is critical for preventing the spread of health care-associated infections (HCAI)(1). The World Health Organization (WHO) has developed a set of guidelines for hand hygiene in health care settings, but many health care professionals do not consistently follow these recommendations (2). Studies conducted in various nations have found that handwashing rates among health care staff are low to moderate (1-11). This is a serious problem not only in hospitals, but also in communities where public health (PH) workers can transmit infections to one another and to their patients if they fail to maintain adequate hand hygiene.

All health care students receive some instruction on the theory and practice of hand hygiene for the prevention of infections, but better programs are required because many students and practitioners lack knowledge of handwashing requirements (11, 12), and the hand hygiene instruction provided to students varies from one professional health care discipline to the next (13). PH students, who will eventually work at health care centers, community hospitals, and in the primary care units of large hospitals, have less contact with patients in hospital settings or with human specimens over the course of their studies, so they are less likely to receive infection control training. To date, there have been only a few hand hygiene studies conducted in Thailand, none of which have examined the hand hygiene practices of PH students (4, 9, 14).

Given the risk that serious illnesses will be transmitted by PH workers who lack adequate knowledge of hand hygiene, there is a need for research on their handwashing knowledge, beliefs, and practices. Studies have shown that educational interventions can significantly improve hand hygiene practices, thereby reducing the spread of infections (6, 10, 14, 15). Examining the antecedents to handwashing is useful because it provides insights into which hand hygiene determinants should be emphasized when developing new educational programs.

Hand hygiene compliance rates among health care workers range from 89% to as low as 5%, and average only 38.7% overall (2). Handwashing rates vary significantly based on gender (16), professional role (1, 6, 9, 12, 13), and years of experience, as those who have worked in health care for longer are less likely to comply with handwashing protocols(6). Hand hygiene also varies based on situational factors such as the perceived risks associated with certain procedures (5), the units where staff work (9), and overall work intensity (8). Additional factors that contribute to handwashing rates include staff beliefs (17, 18), and attitudes (8, 17, 19).

Ajzen's Theory of Planned Behavior (TPB)(20) is among the most widely applied theoretical frameworks for determining the influence that beliefs, attitudes, social forces, and feelings of control have on intentions and behaviors in various contexts. TPB predictors include attitudes (the perception of an action as positive or negative), subjective norm (social pressure to perform the action), and perceived behavioral control (PBC) (the expected ease or difficulty in performing an action). These antecedents to intentions, which in turn predict behaviors, arise in response to underlying behavioral beliefs, normative beliefs, and control beliefs. Behavioral beliefs are expectations that an action will have favorable or unfavorable consequences, normative beliefs are assumptions that close personal associates (colleagues, friends, etc.) would approve or disapprove of the behavior, and control beliefs are based on resources and opportunities (or lack thereof) that contribute to the anticipated ease or difficulty in performing an action. The TPB has been used as the theoretical framework for hand hygiene studies in various nations (3, 8, 18, 19, 21, 22).

There is substantial evidence for the TPB variables as predictors of handwashing intentions and behaviors in health care contexts. O'Boyle et al (8) found that TPB variables influenced handwashing intentions, which in turn predicted hand hygiene practices among critical care and post-critical care nurses. Also, Pessoa-Silva et al (21), who studied handwashing determinants for neonatal health care workers, found that subjective norm (for example, a superior's positive opinion of handwashing) and PBC were related to hand hygiene intentions. More evidence comes from the research of Jeong and Kim (18), who examined the TPB beliefs and hand hygiene behaviors of nursing students, finding that behavioral beliefs correlated with normative

beliefs, and that both behavioral and control beliefs predicted hand hygiene behaviors. In another study of nurses, White et al (19) found that the TPB variables (attitude, subjective norm, and PBC) as well as group norm, subjective knowledge, and risk susceptibility predicted hand hygiene intentions, and that intentions and PBC directly influenced behavior. In addition, Jenner et al (3) demonstrated that attitudes and personal responsibility predicted the hand hygiene practices of health care workers, and that PBC and intentions predicted behavior, and Al-Khawaldeh et al (17) found that attitudes, knowledge, and beliefs predicted the handwashing rates of nursing students.

Further evidence for beliefs as important factors in hand hygiene comes from the research of White et al (22), who examined the TPB beliefs that contribute to attitudes, subjective norms, and PBC among nurses. Beliefs that support handwashing include the assumptions that hand hygiene will prevent infection, that patients and most colleagues support it, and that handwashing stations are accessible. Beliefs that could negatively impact hand hygiene include the assumptions that handwashing is too time consuming, that it will damage hands when done frequently, that some doctors do not support it, and that staff are far too busy in general or frantic in emergency situations to wash their hands.

Given the evidence for the TPB variables as antecedents to health care workers' hand hygiene practices, a conceptual model was developed for this research based on the TPB framework. This model proposes that hand hygiene knowledge, TPB factors, and handwashing intentions and behaviors will vary from one Sirindhorn College of Public Health (SCPH) institution to the next. Applying this framework provides a comparison of the relative effectiveness of current SCPH hand hygiene programs in Thailand and identifies handwashing determinants that require improvement to increase handwashing rates among PH students.

The aims of this study were to assess and compare the handwashing determinants and behaviors of students attending two different SCPH colleges. This research provides information about the hand hygiene beliefs, attitudes, social influences, control perceptions, and behaviors of PH students in Thailand, thereby making an original contribution to the literature as few studies have examined antecedents to handwashing in Thailand and none have explored this issue in the context of public health education. However, the findings also have practical implications because they can be used to guide the development of more effective hand hygiene education programs for PH students.

Methodology

This research was conducted as a cross-sectional, descriptive survey study with a focus on Thailand's SCPH. The handwashing determinants and practices of student groups from two different SCPH institutions were quantitatively identify the association between determinants and practices among PH students.

Thailand's seven SCPH institutions are managed by the Prabommarajchanok Institute for Health Workforce Development (PIHWD), which oversees the development of health care workers who will be employed by the Ministry of Public Health (MOPH). Two of the SCPH institutions, the SCPH Suphanburi (SCPH-SP) and the SCPH Ubonratchathani (SCPH-UB) were selected purposively, as these colleges were established around the same time and offer the same three academic programs: bachelor's degree programs in community public health (CPH) and dental public health (DPH) and a high vocational certificate in technical pharmacy (TP). The sample (n = 120) comprised randomly selected student volunteers enrolled in the SCPH-SP (n = 60) and SCPH-UB (n = 60) colleges.

Data were collected with a self-administered four-part questionnaire, which was developed from the WHO (2) handwashing guidelines and Ajzen's TPB(23, 24). The first section covered basic demographic information and sources of handwashing knowledge. The second and third sections comprised a series of questions designed to produce scores for handwashing knowledge and the TPB variables: behavioral, normative, and control beliefs; attitudes, subjective norms, and PBC; and handwashing intentions. The final section assessed actual handwashing behaviors.

The questionnaire was evaluated by a panel of health education experts to assess its validity, receiving an item-objective congruence score of > 0.5. Some questions were modified in response to suggestions made by the panel, after which the questionnaire was tested for reliability. The instrument received an internal consistency score of 0.71, just above

the threshold for acceptability (Cronbach's alpha > 0.70) when comparing groups (25).

Descriptive statistics (means and standard deviations) were used to provide an overview of demographic characteristics, handwashing knowledge, TPB determinants, and outcomes (self-reported hand hygiene behaviors). Regression analysis was conducted to determine the association between the handwashing knowledge, TPB antecedents, the intentions of students attending, and handwashing practices among PH students.

The study was approved by the Research Ethics Committee at Chulalongkorn University. All participants were over the age of 18 and capable of providing informed consent. No personally identifying information was collected, and respondents' anonymity was maintained throughout the research process. Informed consent was obtained from all individual participants included in the study.

Results

Demographic information and sources of handwashing knowledge are summarized in Table 1. The majority of the study participants were female students (88.33%) between 18 and 22 years of age. The CPH program had the largest representation (43.33%), followed by the DPH program (36.67%) and the PT program (20.00%). Similar proportions of students were drawn from each year of study, and most had received their first instruction in handwashing practice from teachers (77.50%) and/or printed materials (74.17%). Other sources of handwashing information cited by the respondents included television (41.67%), health workers (33.33%), and billboards (31.67%). The majority (94.17%) had received some handwashing training within the past three years.

Table 1 Demographic characteristics and sources of handwashing knowledge (n=120)

Characteristics		Total
Age (Mean, SD)		21.02, 2.98
Gender		
	Male (%)	11.67
	Female (%)	88.33
Year of study		
	1 (%)	24.17
	2 (%)	27.50
	3 (%)	24.17
	4 (%)	24.17
Curriculum		
	Community Public Health (%)	43.33
	Dental Public Health (%)	36.67
	Pharmacy Technic (%)	20.00
First learning of handwashing practice		
	Teachers (%)	77.50
	Printed materials (i.e., posters, brochures) (%)	74.17
	Television (%)	41.67
	Health workers (%)	33.33
	Billboards (%)	31.67
Handwashing training in the last three years		
	Yes (%)	94.17

Table 2 provides mean scores and their standard deviations for handwashing knowledge, beliefs, and TPB antecedents. Knowledge scores averaged 74% of its total scores and TPB belief scores ranged from 70% to 76%. Of the TPB determinants, attitude scores were the highest at 85% for the SCPH students. Scores for subjective norms and PBC ranged from 71% to 72%, and handwashing intentions were high at 80%.

Table 2 Means and standard deviations for knowledge, beliefs, and TPB variables

Variable	Total possible score	Mean	SD
Knowledge	22.00	16.32	2.50
Beliefs			
Behavioral	84.00	64.44	9.64
Normative	42.00	30.43	6.61
Control	98.00	68.65	10.97
TPB predictors			
Attitude	42.00	35.97	7.63
Subjective norm	28.00	19.93	4.54
PBC	28.00	20.29	4.04
Intentions	21.00	16.94	3.93

Table 3 shows median handwashing rates after various activities for which hand hygiene is recommended. The PH students were most likely to wash their hands after using the toilet (10.00 per 10 incidences), handling dirty objects (9.00), visiting patients at the hospital (9.00), and playing with pets (9.00). Median scores were lower for food preparation (8.00), eating (7.00), coughing or sneezing (7.00), and returning to food preparation after an interruption (7.00).

Table 3 Medians and interquartile ranges handwashing rates per 10 incidences

Opportunity for handwashing	Median	Interquartile range
Handwashing practice		
Before preparing food	8.00	4.75
Before going back to prepare food after being interrupted	7.00	5
After using toilets	10.00	1
After coughing or sneezing	7.00	5
After handling dirty objects	9.00	3
After playing with pets	9.00	3
Before eating food	7.00	5
After visiting patients at hospitals	9.00	3

Discussion

Handwashing is critical for reducing pathogen transmission risk, yet research has shown that many health care professionals and students fail to maintain adequate hand hygiene (1, 2, 4-8, 10, 11). Handwashing is particularly important for PH students, who will work with the public in various capacities when they complete their studies.

Other researchers have found that hand hygiene knowledge predicts handwashing behaviors (17, 22), and the mean handwashing knowledge score for the participants was 74% of total possible scores, which may account for their higher-than-average handwashing rates. The high average knowledge score indicates that Thailand's SCPH colleges are conveying the importance of hand hygiene, but there is room for improvement. Knowledge scores should ideally be increased to 100% to improve adherence to handwashing guidelines. The finding that SCPH students have incomplete knowledge of handwashing protocols accords with other research indicating a need to provide better hand hygiene instruction to students who will work in health care fields (12).

TPB belief scores ranged from 69% to 76%, indicating that precursors to attitudes, subjective norms, and PBC could be improved with targeted interventions. Beliefs that may negatively impact hand hygiene identified by White et al (22) include the perception that handwashing takes up too much time, that staff are too busy to do it, and that certain colleagues do not approve of taking the time required for handwashing. It may be useful to target these assumptions with future interventions, as underlying beliefs contribute to handwashing rates (17-19).

Attitudes toward handwashing received the highest mean scores of all the TPB variables, indicating that the students attending SCPH institutions have generally positive attitudes toward hand hygiene, likely due to their high level of knowledge. The generally high attitude scores for the SCPH students combined with their higher-than-average handwashing rates are in line with the findings of other research

demonstrating that attitudes influence hand hygiene behaviors directly (17) or indirectly through intentions (3). Although the direct contribution of attitudes to hand hygiene was not examined in the current study, the results suggest a possible relationship between attitudes and behaviors.

The SCPH students' handwashing rates were much higher than those found in many other studies. The SCPH students reported washing their hands more than 60% of the time for all activities that require it, compared to the global average of 38.7% for health care workers (2). However, the students did not consistently adhere to the WHO (2) guidelines, which indicates a need to provide additional hand hygiene instruction.

The findings of this study indicate that SCPH students receive instruction in hand hygiene and that they have substantial but incomplete knowledge of handwashing guidelines. Their handwashing rates are higher than average, but there is room for improvement, as they do not consistently adhere to hand hygiene guidelines. Handwashing rates before food preparation and consumption and after coughing or sneezing average less than 80%, which indicates a need for further intervention to improve the handwashing practice among students.

The findings of this research may be limited by reliance on self-report, as self-reported handwashing rates tend to be higher than observed rates (8). Given this limitation, conducting an observational study might yield more informative results. Inferential analysis would also be useful for determining the degree to which particular TPB antecedents contribute to handwashing behaviors, as this would provide insights into the beliefs and attitudes that should be targeted when developing hand hygiene interventions for PH students.

Programs for improving hand hygiene practices among health care students and workers should be guided by the best practices identified in Luangsanatip et al.'s systematic review and meta-analysis of hand hygiene studies (15). Interventions are most likely to be effective when they include incentives, goal setting, and accountability mechanisms, so these strategies should be incorporated into hand hygiene interventions where possible.

Conclusion

SCPH students' attitudes toward handwashing are generally favorable and their handwashing rates are high, but they do not consistently adhere to handwashing protocols. Therefore, handwashing practice among SCPH students is room for improvement, with potential interventions targeting beliefs, social factors, and perceived barriers to handwashing.

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