ASSESSMENT OF AWARENESS LEVEL OF STUDENTS IN JUST TOWARDS HAND WASHING

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ABSTRACT

A cross sectional study conducted among 578 students at Jordan University of Science and Technology to examine the hand washing knowledge among the students and to compare the hand washing knowledge of medical and non-medical students. Data were collected using a questionnaire consisting of three sections (awareness, practice and attitude. The study showed that 78.8% of the students are aware of hand washing, 52.6% have positive attitude towards hand washing and 90.7% practice good hand washing. Findings from regression analysis showed that faculty and age is associated with awareness with non medical students and students of 24-29 years age category less likely to be aware of hand washing compared to medical students and students in the early age category. Variables associated with attitude were faculty, gender and awareness of hand washing, with OR 0.5, 0.01 and 1.8. Students that practice good hand washing are 7.56 more likely to be aware of hand washing and 5.70 to have good attitude on hand washing. It can be concluded that faculty, gender, age, awareness and attitude are the predictors of hand washing among university students.

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INTRODUCTION

Hand washing refers to the process of cleaning hands with water, a cleansing agent such as soap or an antiseptic solution. The term hand hygiene is a universal term that refers to activity aimed at cleaning the hands, for instance hand washing, hand antisepsis or use of an alcohol-based hand rub[1].

Global hand washing day (GHD) is a campaign to motivate and mobilize millions around the globe to wash their hands with soap. Raising awareness of hand washing campaign with soap as a key approach to disease prevention. During the annual World Water Week 2008, held in Stockholm from August 17 to 23, 2008, the Global Hand Washing Day (GHWD) was proposed, and was initiated by the Public Private Partnership for hand washing (PPPHW). The global hand washing day on October 15 2008, took place for the first time in accordance with year 2008 as the International year of sanitation as a day appointed by United Nations General Assembly (UNGA)[2].

The use of soap to clean the hands is the most effective and inexpensive means to prevent diarrhea and its spread. It has been established that hand washing with soap decreases the dangers of diarrhea by 42-47%, also half of all food borne illnesses could be reduced or eliminated by proper hand washing. More lives can be saved by washing the hands before eating and after toilet use than using vaccine or medical intervention. Hand washing results in halting half of deaths from diarrhea and acute respiratory infections are reduced by one-quarter. The Center for Diseases Control and Prevention (CDC) has stated that “It is also well documented that one of the most important measures of preventing the spread of pathogens is by hand washing"[3].

A key factor in preventing transmission of colds, diarrhea, and influenza viruses, which is considered a social norm, is hand hygiene. Our parents introduce us to the hand washing concept, our teachers, health professionals, and peers confirmed its importance as a tradition to help

decrease the spread of infectious disease. A major challenge in infection control is maintaining a good hand hygiene practice which is a well established norm[4].

Transmission of many infectious diseases occur primarily by hands, especially among those who live and work in close proximity to one another such as in hostels, classes, military barracks, college dormitories and camps during the summer. Microbial cross-contamination and transmission in hospitals, health care facilities, dormitories and schools have significant predisposing factors. Environments that are close, doorknobs in toilets and other inanimate objects serve as a hidden grounds for microbes and also contaminated hands serving as vehicles of transmission of diseases which contribute to increased infection rates among these groups. Teaching institutions including child care centers, elementary and high schools including universities emphasize that appropriate hand hygiene practices can promote wellness and have numerous benefits in a wide variety of places[5].

Factors that contribute to lack of hand hygiene practices are time constraints, lack of washing products and the lack of sinks in most classroom environments as such alternatives to hand hygiene practice and hand washing with soap and water is the use of a waterless alcohol gel hand sanitizer. Hand sanitizers offer a quick, easy, and effective hand hygiene practice. Hand hygiene is considered as the most important measure for preventing the spread of pathogens. Proper sanitation is important not only from the general health point of view but it has a vital role to play in our individual and social life too. It has been recognized as an important procedure in preventing the transmission of disease. About 80% of diseases are associated with poor domestic and personal hygiene in developing countries and about 2.2 million people; mostly children and school students die yearly due to diarrhea[6].

Correct hand washing practices can prevent the entry of microorganism which reduce the rate of water borne and food borne pathogens. Surface sterilization in the process of hand washing with soap drastically reduces bacterial count. Hand washing represents an important element of hygiene that may interrupt transmission of microorganisms. Hand surfaces especially under the fingernails and other parts of the hand are reservoir for the growth of microorganisms. Risk of infection that can cause enteric infection might be posed in schools and colleges were students are more likely to take meal and water without washing hands. About 26-62% cut in the incidence of diarrhea in developing and under developed countries can occur by the use of soap and hand washing promotion. Hand washing with warm water and soap can greatly trim down the chances of spreading or getting microbes. The microbes on our hand can be removed by the mechanical action of scrubbing which loosens up the dirt and the soap picks them up and binds to them so that the water can wash them away[7].

Major concern to parents, adults, school personnel, and youth themselves is health and hygiene issues. Proper washing of hands is one key issue within the health and hygiene context. Youth, children, and adults pursue range of activities such as playing, farming, cooking, and cleaning in which proper hand washing is very important in day-to-day lives. Outbreaks of upper respiratory illness that is group B Streptococcus colonization and Norwalk-like viruses among college students occur due to low hand hygiene compliance[8].

AIM

This study is carried out to examine the awareness level of students towards hand washing in Jordan University of Science and Technology (JUST).

OBJECTIVES

The study objectives are;

1. Determining the prevalence of hand washing practice among students.

2. Comparing the hand washing awareness of medical and non-medical students.

3. Determining practice and attitude of students hand washing.

METHODOLOGY

Study Design:

A Cross sectional study design was used for this study. It is designated cross sectional because the information gathered is a representation of what occurred at a specific time. Convenient sampling method was used.

Study Setting:

The study took place, in Jordan University of Science and Technology (JUST), because it provides a rich mix of youth from different background, social groups and geographical area.

Study Population and Sample:

The study population included students from both undergraduate and graduate, from all levels in JUST. The researcher obtained data from both married and unmarried students between the ages of 18-35 years, who were enrolled in different faculties of the university. A total of 25610

students from different nationalities are registered in JUST. A sample of 578 students was selected using the formula for determining the study sample is below[9].

$$n = \frac{Z^2 pq}{d^2}$$

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384.16 = 385 \text{ students}$$

n = 385×1.5= 577.5 = 578 (to increase the sample size to compensate for the non- responders).

Where;

Z= the appropriate value from the normal distribution at 95% level of confidence 1.96

n=sample size

p= 50% anticipated population proportion i.e. the expected value of the proportion of individuals in a population possessing the hand washing awareness.

q= 1-p

d = precision level.

Pilot Study:

Piloting was conducted to recheck the questionnaire. The pilot was done to find out how good the questions are and the time needed to complete the questionnaire. Thirty (30) students were given the questionnaire for pre-testing to find out their opinion regarding the questions for possible improvement. Some amendments were made before finally administering the questionnaire to the target population.

Data Collection:

A questionnaire was used to solicit information on socio-demographic characteristics awareness, hand washing practices and attitude, an observational survey research was conducted during the 2013/2014 academic year. Explaining the research objectives and participants consents was taken before inclusion into the study. The questionnaires were distributed to students.

The study used observational methods similar to those used by Guinan et al 1997, in that the washing behavior among students after bathroom use and in different locations[10] in the university assisted by a research assistant, unknown to the students. The vantage point (a place or position affording a good view) is selected to minimize Hawthorne effect that can result from the presence of a suspected observer. The identity of the observers was not recorded .The toilets in the library, cafeteria and toilets at the medical school and non-medical school buildings. Data collected include time of hands washed and washing behavior were recorded in to 3 categories: no washing (leaving the rest room without washing or rinsing their hands), attempted hand washing (wetting hands without using soap), and washing hand with soap. Thirty minutes in each of the observations site for ten working days.

Data Collection Tool:

The background survey was developed by the researcher based on the hand washing demographic questions. A self developed questionnaire validated by Dr Atallah Z. Rabi (the main advisor). The background questionnaire was divided in to four sections;

A. Demographic information about the respondents, which include (5 question); age (between the ages of 18 and above), gender, marital status (single and married) and faculty (medical and non-medical faculties)

B. Awareness of students on hand washing included (6 question); are you aware of the importance of hand washing?, do you know GHWD?, have you seen a poster reminding you of hand washing?, do you remind a friend or colleque to wash his/her hands after touching dirt?, hands are the important vehicles of disease transmission?, and the effects of hand washing does not depend on how long you wash your hands but on how you wash them?. The options were either yes or no.

C. Practice of hand washing practice which included (6 questions); do you wash your hands after toilet use? do you wash your hands when handling food?, do you wash your hands before eating?, do you wash your hands after eating?, do you wash your hands after touching dirt? and finally, do you wash your hands after touching an ATM? also the options were either a yes or a no.

D. Attitude of hand washing among students (4 questions): the duration of hand washing, products use to wash the hands, reason for not washing the hands and the frequency of using soap were the questions asked to determine attitude.

Questions in the three sections i.e. awareness, practice, and attitude were given a score and a total of each was obtained. Each question in the awareness section was given a point with the total number of score being 12. A score of 9 (75%) or above was considered to be aware of hand Washing. Questions on attitude and practice were also calculated and score of 75% or more was considered to be having a good hand washing practice and having positive attitude on hand washing. A copy of the questionnaire is attached in appendix 1?

RESULTS AND DISCUSSION

Table 4.1 indicated that 53.3% were females and 46.7% were males. Students between the ages of 18-23 years represent the majority of the participants (81.8%). The sample was almost equally distributed between medical (50.7%) and non medical (49.3%) students. Undergraduate students and those that are not married are the majority with 95.5% and 84.3% respectively.

Table 1: Demographic Data of Students

VARIBLES	**No.**	**%**
1**. GENDER** Female: Male:	 308 270	 53.3 46.7
2. **AGE**		

18-23:	473	81.8
24-29:	86	14.9
30-35:	19	3.3
3. **MARITAL STATUS**		
Single:	552	95.5
Married:	26	4.5
4. **FACULTY**		
Total Non-medical:	285	49.3
Architecture:	40	6.9
Agric:	35	6.1
Engineering:	81	14.0
Computer:	45	7.8
Science and Art:	84	14.5
Total Medical	293	50.7
Medicine:	77	13.3
Nursing:	41	7.1
Pharmacy:	43	7.4
Vet nary:	7	1.2
Dentistry:	89	15.4
Applied Medical Science:	36	6.2
5.**LEVEL OF EDUCATION**		
Undergraduate:	487	84.3
Graduate:	91	15.7

Table 2: Distribution of Students Hand Washing Awareness and Socio Demographic Variables.

Variables	Awareness towards hand washing		Total	P value
	Aware n (%)	Not aware n (%)		
Gender				.260
Female	226 (80.7)	54 (19.3)	280	
Male	119 (76.7)	58 (23.3)	249	
Age (years)				.001
18-23	355 (82.0)	78 (18.0)	433	
24-29	50 (64.9)	27 (35.1)	77	
30-35	12 (63.2)	7 (36.8)	19	
Marital Status				.0053
Single	404 (79.5)	104 (20.5)	508	
Married	13 (61.9)	8 (38.1)	21	
Faculty				.002
Non-medical	186 (73.2)	68 (26.8)	254	
Medical	231 (84.0)	44 (16.0)	275	
Level of education				.002
Undergraduate	359 (81.2)	83 (18.8)	442	
Graduate	58 (66.7)	29 (33.3)	87	

Non medical faculties				.007
Architecture	29 (85.3)	5 (14.7)	34	
Agriculture	27 (87.1)	4 (12.9)	31	
Engineering	39 (58.2)	28 (41.8)	67	
Science and Art	60 (79.9)	18 (23.1)	78	
Computer and Info Tech	31 (70.5)	13 (29.5)	44	
Medical faculties				.008
Medicine	58 (79.5)	15 (20.5)	73	
Nursing	30 (83.3)	6 (16.7)	36	
Pharmacy	31 (72.1)	12 (27.9)	43	
Vet nary	6 (85.7)	1 (14.3)	7	
Dentistry	79 (96.3)	3 (3.7)	82	
Applied medical science	27 (79.4)	7 (20.6)	34	

Data on table 2 indicated the hand washing attitude among students. The differences in percentages among faculty, gender and awareness among students were statistically significant with $P < 0.05$. Age, marital status, within medical faculty, within non medical faculty and level of education were not statistically significant with a $P > 0.05$.

Table 3: Adjusted Odds Ratio and Level of Significance of Awareness of Hand Washing Among Students.

Variables	P value	OR	95% CI	
			Lower	Upper
Gender				
Females	Reference	-	-	-
Males	0.611	1.13	0.70	1.82
Age				
18-23	Reference	-	-	-
24-29	0.047	0.43	0.18	0.98
30-35	0.544	0.59	0.11	3.14
Marital status				
Single	Reference	-	-	-

Married	0.36	0.55	0.15	1.96
Faculty Medical Non medical	 Reference 0.011	 - 0.56	 - 0.36	 - 0.87
Level of education Undergraduate Graduate	 Reference 0.982	 - 0.99	 - 0.41	 - 2.34

Data in table 3 on odds ratio of attitude shows that only gender, faculty and awareness on hand washing were found to be significantly associated. This explained that males are 0.6 times less likely and non medical students are 0.5 times less likely to have positive attitude than females and medical students (95% CI: 0.4-0.9) and (95% CI: 0.4-0.8) respectively. Those that were aware of hand washing are 1.8 times more likely to have positive attitude than those that were not aware (95% CI: 1.1-2.8).

Table 4: Observation of Students Practicing Hand Washing at the Two Different University Toilets.

	Library toilet		Medical toilet		Non medical toilet	
	MALE n (%)	FEMALE n (%)	MALE n (%)	FEMALE n (%)	MALE n (%)	FEMALE n (%)
No hand washing	18 (30)	6 (10)	4 (10)	3 (7.5)	6 (15)	4 (10)
Attempted hand washing	13 (21.6)	22 (36.6)	25 (62.5)	17 (42.5)	15 (37.5)	13 (32.5)
Washing with soap or use of hand sanitizer	29 (48.3)	32 (53.3)	11 (27.5)	20 (50.0)	19 (37.5)	23 (57.5)
Total	60	60	40	40	40	40

Table 5: Observation of Students Hand Washing at Cafeteria in Both Medical and Non-medical Buildings.

	Cafeteria in Medical Building		Cafeteria in the Non-Medical Building	
	MALE n (%)	FEMALE n (%)	MALE n (%)	FEMALE n (%)
No hand washing	50 (100)	48 (96)	50 (100)	50 (100)
Attempted hand washing (washing hands without using soap).	0	2 (4)	0	0
Washing with soap or use of hand sanitizer	0	0	0	0
Total	50	50	50	50

As shown in table 5 almost all the students don't wash their hands before eating and after eating as observed in both the cafeteria of medical and non medical buildings.

Available data collected on the study indicated that 78.8% of students were aware of hand washing nevertheless table 4.8 shows that variables of faculty and age were found to be statistically significant using binary logistic regression analysis, but other variables of gender, level of education and marital status were not. This implies that students in medical faculties were reported to be more aware of hand washing than students in the non-medical faculties. Although in the study findings of Ahmet conducted among Turkish university students in 20011 which revealed that Education faculties were more aware of hand washing compared to medical students the finding was not statistically significant which make it doubtful[11].

In this regard the findings of this study seemed more agreeable due to the fact that students in the medical faculties may appear to show better knowledge of the importance of hand washing and better

understanding of hand washing by virtue of their exposure to the health significance of it compared to the findings of Ahmet[11].

Information pertaining to the availability of posters to increase the significance of hand washing in table 2 indicated that 28.4% of the students have not seen a poster containing messages about hand washing. But the findings of soap and detergent association affirming that 58% of students have not seen hand washing messages in bathrooms or cafeteria or other places[12].

Data on table 3 on hand washing attitude indicated that 83.7% of the students wash their hands for 15 seconds and above and 16.3% for less than 10 seconds. This is however consistent with the findings at a university of A&M Texas in 2008 who indicated that 26.1% of the students wash their hands adequately[13]. In the same vein soap and detergent association in 2002, explained that 76% of the responders wash their hands for 15 seconds or more[12]. In Westminster Maryland in 2003 2% of the students wash their hands for 10 seconds and 32% for 5 seconds[14]. The findings in all the study explained above indicated a greater percentage of the students wash their hands for the required period of 15 seconds.

The totality of the findings showed that 90.7% of the students have a good practice on hand washing as shown in table 4.10. The variables that were found to be associated with practice based on the binary logistic regression were gender, age, awareness on hand washing and attitude on hand washing. Marital status and level of education were not associated with hand washing practice. Male students have better hand washing practice than female students. Surprising finding exist based on the available data conducted in Texas, Malaysia and Turkey which

showed that females students are more likely to practice hand washing than males students[13, 15, 11].

High majority (74.5%) of the students do not wash their hands after touching an ATM. This is of public health interest in which it was documented in 2011 by Dr Richards that ATM machines were contaminated with high number of bacteria similar to those found in toilets which are known to cause illness[11]. Related to this development a research firm also reported that 22% of responders reported not to wash their hands after touching money which is also found to be a surface for acquiring bacteria[16]

Hand washing was observed at the three toilets of male students, which showed that hand washing decreased compared to information available on the findings of the questionnaire. Similar findings related to hand washing observation was found that after observing the responders hand washing behavior the percentages that actually wash their hands decreases as observed by Joeng in 2007[17], Munger and Harris in 1989[18] and Donald in 2002[19].

CONCLUSION

It can be concluded that faculty, gender, age, awareness and attitude are the predictors of hand washing among university students. It is interesting not to find an association between faculty and practice.

RECOMMENDATION

The findings of the study recommended the following:

1. Hand washing supplies should be provided in all rest rooms at all the times.
2. Students should at all times carry along hand sanitizers in situation where there is no availability of soap.

3. Posters to remind students to wash their hands should be posted on the walls above sinks.
4. Education to promote hand washing should be routinely done.
5. Hand wash basins at the cafeteria should be visible to allow students to make use of them.
6. Research should target non-medical students rather than targeting medical students because it is believed that medical students already have hand washing ideas and will tend to implement it more than non medical students.
7. It is also recommended that future studies should focus on observational studies followed by an intervention to measure the changes among students.

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