

Evidence based Approaches towards Hand Hygiene

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Abstract

This study involves the evidence-based practices used in various preoperative settings for basic hand hygiene and to provide the essential tools for the implementation of hygiene practices and the improvement programs necessary in health care facilities.

Objective: To assess whether proper and well designed and recognized hand hygiene methods are being practiced and implemented by dentists working in various health care sectors, understanding the organizational social cognitive or structural barriers to the practical adherence to hand hygiene in health care facilities and to develop policies to assist the policy makers agencies and institutions in developing strategies which are more effective and efficient for the development of hand hygiene practices.

Method: A questionnaire was completed and Data was collected from 500 dentists working in three university hospitals and 25 private clinics, and was analyzed using SPSS 19.0 program.

Conclusion: A process of altering social attitudes and behaviors towards hand hygiene practices and prevention of infection can be initiated by improved and better understanding of knowledge and attitude towards the hand hygiene and the barriers related to opt the practices. Incentives for the adherence to practice the recommended techniques will be useful and provide an efficient and effective way for the development of well-organized and proficient hand hygiene programs. Major factors responsible for poor adherence with hand hygiene practices includes non availability of sinks and hand washing agents like soap, water and towels, busy schedule due to understaffing lack of guidance and proper knowledge of importance and technique of hand washing, low risk of acquiring infections and disagreement with the hand hygiene recommendations

Keyword: Hand hygiene, Disease control, Prevention, Infection control, Barriers in maintaining hygiene

Introduction

Hand hygiene is broadly recognized as the most economical as well as successful methods to lessen the frequency of infections associated with health care. Hand hygiene practice in hospital and clinical settings as the most protective measure has been approved by well recognized organizations such as the World Health Organization, Centers for Disease Control and Prevention, Australian Commission on Safety and Quality in Health Care, The National Health and Medical Research Council and Hand Hygiene Australia and they have provided comprehensive guidelines about the practices of hand hygiene. Furthermore, the additional resources to assist facilities with exertion of the latest evidence-based practices has been published by joint commission. 1847- Ignaz Semmelweis an Austrian physician provides the first substantiation that if healthcare providers wash their hands with an antiseptic agent between patients HCAs can be lessened, later in 1900s-The importance of hand washing and hand gloving gain pervasive acceptance. In 1975 and 1985 by the Center of disease control and prevention published the guidelines to support the use of alcohol-based antiseptic products when sinks aren't available⁽⁶⁾ in 2002- the Center of disease control and prevention for the first time recommended that health care providers should avoid artificial finger nails and keep them short and free from nail polish.⁽³⁾ In 2009-The World health organization publishes guiding principles on surgical hand preparation⁽²⁾. After wards in 2010- recommendations were published by Association of

registered nurses (AORN) that harmonize with the 2002 Center of disease control and prevention (CDC) and 2009 World health organization (WHO) guidelines for hand hygiene in the perioperative setting. Wearing gloves alone does not replace the need for hand cleansing by either hand rubbing or hand washing⁽⁴⁾ so according to revised recommendation performing a surgical hand scrub before wearing the sterile gloves is a mandatory requirement and proposed that healthcare providers could use an antimicrobial surgical scrub agent or an alcohol-based antiseptic surgical hand rub that met FDA requirements for surgical hand antisepsis.⁽¹⁶⁾ Proper hand hygiene before and after touching the patient and inert objects and after exposure to the bodily fluids is recommended according to most recent guidelines by World health organization.

Hand hygiene in the perioperative setting consists of two components:

- Simple hand washing, performed with soap and water or antiseptic hand wash.
- Surgical hand scrub, which is performed before a surgical or other invasive procedure before sterile gloves are donned. Sponge or brush can be used for this⁽¹⁷⁾

Association of registered nurses (AORN) recommends the use of a traditional standardized anatomical timed scrub or counted stroke method for surgical hand scrub and encourages institutions to follow the scrub agent manufacturer's written recommendations when establishing policies and procedures for scrub times.⁽¹⁵⁾ However AORN's standards note that the use

of a brush for surgical hand scrub isn't necessary and that scrubbing with a brush can damage skin, creating micro crevices that encourage bacterial growth and increased bacterial load.⁽⁸⁾

Products for hand hygiene are available in a wide range of forms to fulfill the clinical needs of the healthcare workers. Most important agents among them include non-antimicrobial soap chlorhexidine, alcohols, iodine and triclosan. Most common products available to healthcare professionals in hospitals and clinical settings are alcohol-based since alcohol is highly potent against a wide range of microorganisms.

The antiseptic drug products can be summed up into two unique categories:

1. Surgical hand scrubs: a preparation containing antiseptic which significantly reduces the number of microorganisms on skin.
2. Antiseptic hand washes: a preparation having antiseptics prepared for regular use, after washing, and drying it reduces the number of microorganisms on skin to an preliminary level.

Availability of alcohol-based hand rubs is critical to promote effective hand hygiene practices, in particular in settings without access to running water. Introduction of an alcohol-based hand rub has led to increased hand hygiene compliance among healthcare workers and decreased health care-associated infections.⁽⁴⁾ Studies investigating HCWs generally have reported a range of barriers, including environmental barriers (e.g., lack of access to sinks, difficulty of locating products, empty dispensers, dispensers and time constraints) and personal barriers (e.g., attitudinal beliefs, skin irritation from repeated hand washing).⁽⁹⁾ The basic aim of this study is to evaluate whether well recognized hand hygiene

programs are being adopted and practiced by dentists working in various health care sectors and to understand various barriers to hand sanitation observance in hospitals and to develop measures to aid the health care institutions in developing more efficient and professional strategies for implementation of hand hygiene practices.

Method

This cross-sectional study was conducted. It included all the dentists working in private and public sector with no exclusion criteria and a combined open and close format questionnaire was designed and self distributed to all the participants and Data was collected from 500 dentists using convenience sampling. Out of 500 dentists 147 (29.4%) were male and 353(70.6%) were females, working in three biggest teaching hospitals (Islamic International Dental College, Pakistan Institute of medical and health sciences, Rawal Institute of Health Sciences) and 25 private clinics of Islamabad Pakistan, and was analyzed using SPSS/WIN 20.0 program..The content and type of the study was explained and the consent was obtained from individuals who were willing to participate. A questionnaire composed of a set of questions concerning hand-hygiene knowledge and practices was given to all participants. Awareness was assessed using WHO’s hand hygiene principles for health care professionals. The Performa of 20 questions consisting of multiple choice questions and “yes” or “no” questions. Data was assessed by using SPSS software. Expressive figures were used to calculate percentages for each of the answers given.

Result Discussion

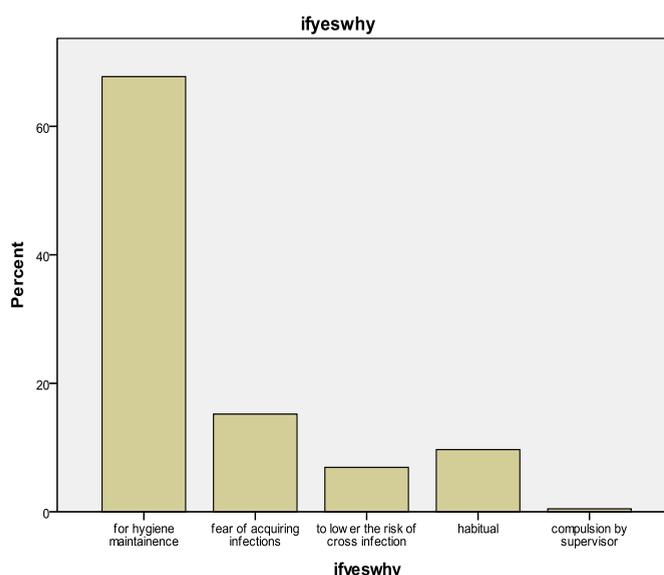
		Frequency	Percent	Valid Percent	Cumulative Percent	Bootstrap for Percent ^a			
						Bias	Std. Error	95% Confidence Interval	
								Lower	Upper
Valid	Yes	217	43.4	43.4	43.4	.0	.0	43.4	43.4
	No	233	46.6	46.6	90.0	.0	.0	46.6	46.6
	Sometimes	40	8.0	8.0	98.0	.0	.0	8.0	8.0
	mostly but not always	10	2.0	2.0	100.0	.0	.0	2.0	2.0
	Total	500	100.0	100.0		.0	.0	100.0	100.0

a. Unless otherwise noted, bootstrap results are based on 500 stratified bootstrap samples

In our study, there were 500 dentists (147 male and 353 female) who filled the questionnaire. Out of which, 217(43.4%) were observing and practicing the hand hygiene measures. and 233(46.6%) were not adhered to hand hygiene. however 40(8%) opted it sometimes. and those following it mostly were only (2%) of the total.

Of those responded yes, 147 (67%) were following the intervention for the maintenance of hand hygiene, second main reason was the fear of acquiring infection which was opted by 33 (15%) of the total. 15(7%) were following to lower the risk of cross infection and as a habit 21 (9%) whereas less than 1% were following it as a compulsion.

		If yes why			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	for hygiene maintenance	147	29.4	67.7	67.7
	fear of acquiring infections	33	6.6	15.2	82.9
	to lower the risk of cross infection	15	3.0	6.9	89.9
	Habitual	21	4.2	9.7	99.5
	compulsion by supervisor	1	.2	.5	100.0
	Total	217	43.4	100.0	
Missing	System	283	56.6		
Total		500	100.0		

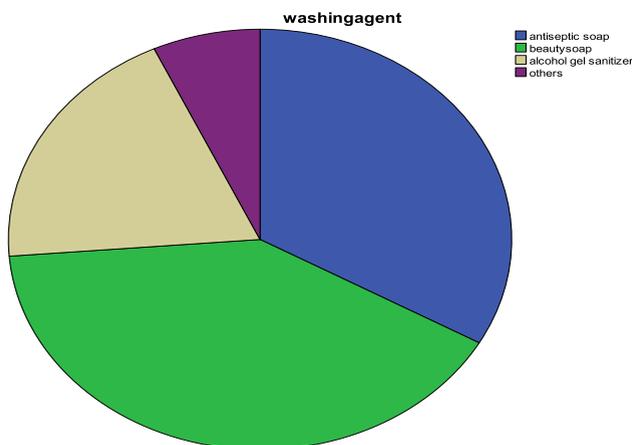


Barriers to hand hygiene amongst survey respondents included "lack of effective educational programs" (24%), "time constraints" (21%), "false sense of security with gloves (16%), "inconvenient locations of sinks or inaccessible materials" (15%), "lack of facilities or supplies" (9%), and "insufficient training or guidance" (6%); some respondents selected multiple barriers. Although no mentionable data was collected to evaluate the incidence of skin irritation associated with use of the offered hygiene products, a few of the health care workers in all the health care sectors were of the view that the gel sanitizer was less irritating than either the foam sanitizer or soap and water.

		If no why			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	lack of educational program	55	11.0	23.6	23.6
	time constraint	48	9.6	20.6	44.2
	inconvenient location	35	7.0	15.0	59.2
	false sense of security	37	7.4	15.9	75.1
	lack of supplies	21	4.2	9.0	84.1
	lack of guidance	14	2.8	6.0	90.1
	Others	22	4.4	9.4	99.6
	11.00	1	.2	.4	100.0
	Total	233	46.6	100.0	
Missing	System	267	53.4		
Total		500	100.0		

Beauty soap and antiseptic soap either used in the form of bar or liquid hand wash had almost equal utility that is at baseline (41% and 33% of attempts, respectively). Alcohol Gel sanitizer was used in 20% of hand hygiene attempts.

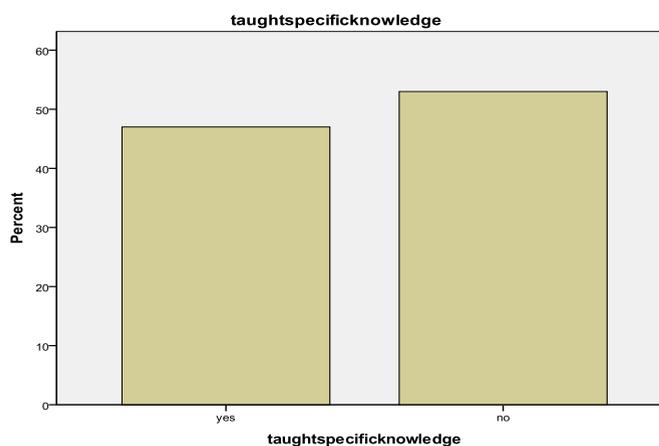
		Washing agent			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Antiseptic soap	72	14.4	33.2	33.2
	Beauty soap	88	17.6	40.6	73.7
	alcohol gel sanitizer	42	8.4	19.4	93.1
	Others	15	3.0	6.9	100.0
	Total	217	43.4	100.0	
Missing	System	283	56.6		
Total		500	100.0		



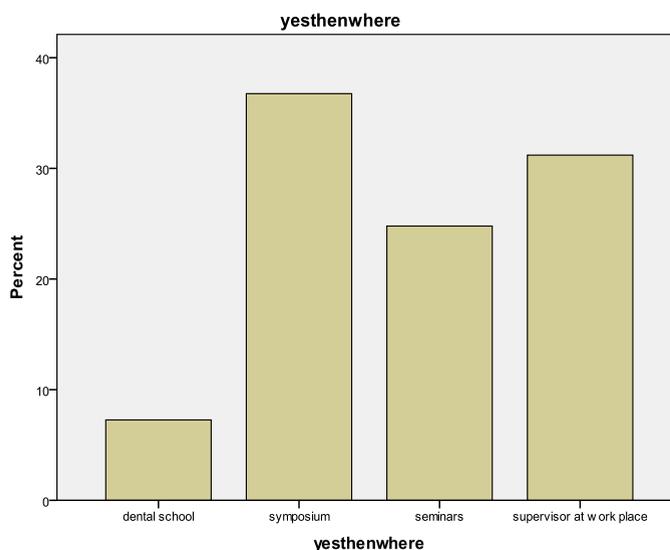
In all the observant who were following hand hygiene practices, 89(41%) did not have the sound knowledge of WHO recommended interventions. however 83(38.24.3%) had knowledge but only 45(20%) of them were practicing it.

266(54%) claimed that they have never been taught about the specific technique for hand washing. Whereas 234(46%) said that they have been taught about it, of which through symposiums were 86(36%), by supervisor 72(30%), by workshops 59(25%) and by dental schools 17(7%).

		Taught specific knowledge			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	235	47.0	47.0	47.0
	No	265	53.0	53.0	100.0
	Total	500	100.0	100.0	

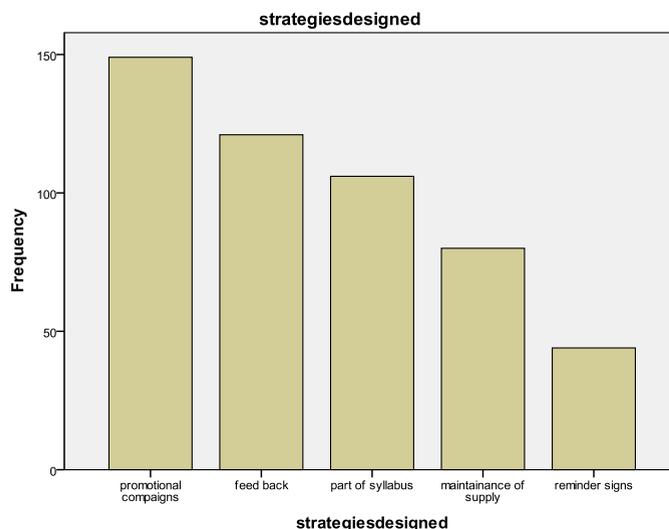


Yes then where					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dental school	17	3.4	7.3	7.3
	Symposium	86	17.2	36.8	44.0
	Seminars	58	11.6	24.8	68.8
	Supervisor at work place	73	14.6	31.2	100.0
	Total	234	46.8	100.0	
Missing	System	266	53.2		
Total		500	100.0		



With regards to the strategies that should be designed to implement hand hygiene practices 30.29% indicated that promotional campaigns including workshops and posters etc., would be the most efficient interference. 24.41% answered that consistent feedback of measures taken for hand hygiene would be the most efficient method to improve the hand hygiene. 20.5% were of the view that including hand hygiene guidelines as a part of the syllabus in institutes can benefit in improving the predilection towards hand hygiene practices 16%. Suggested that the installation of additional sinks proper supply of soap and sanitizers will make hand hygiene more convenient, 10% indicated that brightly colored reminder signs on the units would be a successful intervention.

Strategies designed					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Promotional campaigns	149	29.8	29.8	29.8
	Feed back	121	24.2	24.2	54.0
	Part of syllabus	106	21.2	21.2	75.2
	Maintenance of supply	80	16.0	16.0	91.2
	Reminder signs	44	8.8	8.8	100.0
	Total	500	100.0	100.0	



Discussion

Healthcare-associated infections (HAIs) account for an estimated 1.4 million infections and 99,000 associated deaths each year⁽⁴⁾ and 4384 children die every day of health care-associated infections in developing countries.⁽¹⁸⁾ According to the WHO (world health organization) and CDC the best and the leading measure to stop the spread of these infections is the maintenance of hand hygiene as they are well thought-out to be the most common vectors for transmission of infections and health care associated pathogens within health care environment from doctor to patient as well as unanimated objects (i.e., surgical instruments, thermometers, blood pressure apparatus etc), practicing hand hygiene using the soap and water or an alcohol-based hand rub is a mandatory thing to follow. A firm hand hygiene program with standard observance and conformity will lessen risk for spread of microorganisms to patients and also reduce the morbidity and costs associated with treatment of healthcare-acquired. The goal of hand washing is to remove as many microorganisms from the hand as possible to avoid transmission from doctor to patient. This paper reviews the factors that are influencing the adherence to hand hygiene, the role of hand hygiene promotion on transmission of healthcare-associated microorganisms, and the challenging issues related to the universal acceptance and implementation of hand hygiene practices. The main objective is to assess the relative efficacy of each strategic component and to identify the most successful intervention, particularly in settings with limited resources for promoting a strong patient safety culture.

Soap and water is still believed to be the gold standard for hand hygiene.⁽¹⁶⁾ When using soap and water, the WHO recommended technique is to wet the hands first. Then apply 3 to 5 ml of soap to the hands and rub the hands together palm to palm then right palm over other hand with finger interlaced, Palm to palm with

fingers interlaced, rationale rubbing of thumb by gripping it in palm for a minimum of 15 seconds covering all surfaces of the hands and fingers rinse the hands off with water, dry thoroughly with a paper towel and use the paper towel to turn off the faucet^(5,16) If soap and water is not available, and hands are not evidently soiled or contaminated with blood or body fluids one can apply alcohol-based hand rubs (wipes, gels, or foams)⁽⁷⁾ however to ensure the desired efficacy healthcare workers must completely follow the manufacturer's when using these products. In emergency situations where sinks are not available or after removing the gloves. It is strongly recommended to use alcohol based product after direct contact with the patient skin body fluids or excretion mucous membranes broken skin or wound dressings. When using agents containing alcohol, such as wipes, the entire surface of the hand must be covered by the product and allowed to dry prior to donning gloves. In order to maintain adequate moisture in the hands, it may be necessary to apply a healthcare-grade lotion, especially during the winter season. Hand hygiene agents must be carefully selected in order to ensure compliance, efficacy and safety for both the healthcare worker and patient.⁽¹⁶⁾ In evaluation of several factors that act as a barrier the most significant factors are the product unavailability and accessibility within the health care facility, busy schedule, lack of awareness and staff support.

Worldwide, a number of hand hygiene interventions based on the WHO "Clean Care is Safer Care" campaign have been implemented and evaluated (Reichardt et al, 2013; Mestre, et al., 2012; Oh et al., 2012). One such German campaign, "Action: Clean Hands," began in January 2008. Around 700 hospitals took part in the campaign. The key points of this intervention were: increased support from administration, increased education of healthcare staff, measurement of alcohol-based hand-rub consumption, implementation of WHO's "My Five Moments for Hand Hygiene," and increased

availability of hand-rub products (Reichardt, et al. 2013).on evaluation of Germany's "Action: Clean Hands," campaign, it was found that an 11.4% increase in hand hygiene compliance was observed by the 62 hospitals who chose to report their results. Additionally, alcohol-based hand-rub consumption results were reported by 129 hospitals; the data illustrated an overall consumption increase of 30.7%. It was concluded that this campaign has led to an overall increase in hand hygiene compliance throughout the nation (Reichardt et al., 2013) Another study, which was conducted in a medical center of Barcelona, involved interventions based on the WHO approach. Specifically, the healthcare center increased the number of alcohol-based hand-rub dispensers, increased the frequency of hand hygiene compliance audits and provided more consistent feedback to healthcare staff. This intervention was studied over a two year time period and a significant hand hygiene compliance increase of 25% was observed (Mestre, et al., 2012). In Singapore, a slightly different hand hygiene intervention was studied. This intervention involved the implementation of the WHO's five moments for hand hygiene campaign. However, it also involved "providing guidance to nurses in a non-intimidating manner" and communicating openly with the nurses about "the appropriate placement of alcohol-based hand rub at the point of the care" (Oh et al., 2012). The results of this intervention were measured in many different ways including a 50% increase in hand hygiene after contacting a patient or object and a 73% increase in hand hygiene before contacting a patient or object (Oh et al., 2012). The University of Miami-Jackson Memorial Hospital Center for Patient Safety focused on the theory that healthcare workers frequently forget to complete hand hygiene. A study was conducted involving four different approaches to reminding the healthcare staff to utilize hand hygiene products. The first intervention was the relocation of the alcohol-based hand rub dispensers to a position that would be directly in the line of-sight when entering the room. The second intervention involved leaving the dispenser in its original location but adding flashing lights to the container. The third intervention was a combination of the previous two, relocating the dispenser to the line-of-sight position and adding the flashing lights. The fourth intervention was a warning sign placed on the door, stating that the room was under surveillance and an alarm would sound if the healthcare worker failed to complete hand hygiene. The baseline hand hygiene rate in this setting was 36.7%. All four interventions resulted in higher hand hygiene rates, with results of 53.5%, 60%, 66%, and 93.3% respectively (Nevo et al., 2010).

Limitations

One limitation of this study is the possibility that it is asking only a limited amount of information without explanation There is no way to tell how truthful a respondent is being and how much thought a respondent

has put in. the collected data was not tagged with the identities of health care workers since most of the respondents preferred to remain unidentified recording the identities of health care workers is highly recommended so that the data and the statistical analysis would be as accurate as possible.

Conclusion

Improper hand hygiene measures can have detrimental effects on both the doctor and the patient. Due to constant challenges in achieving compliance to hand hygiene measures the clinicians and health care workers should continue to search for new ways to have hold on this important aspect of patient and doctor safety. A surplus of interventions either single or multimodal should be designed to improve the observance of the measures taken to practice hand hygiene. Interventions should include the resources for example, installation of new sinks, readily available products including alcohol based hand wash, education and training of the staff. The government and the health care facilities should invest a considerable time and amount to provide the best environment to practice hand hygiene measures. However changing behavioral perceptions is highly influential and can aid in improving hand hygiene measures. Thus, introduction of materials and knowledge alone without an associated behavioral modification is unlikely to bring a positive increase in hand hygiene compliance.

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