HANDWASHING BEHAVIORS IN FOODSERVICE ESTABLISHMENT RESTROOMS: AN OBSERVATIONAL STUDY

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Introduction

The Centers for Disease Control and Prevention (CDC) identified poor handwashing as a main factor in foodborne illness outbreaks (ServSafe, 2009). They suggested that failure to wash hands, or inadequate washing of hands, contributes to almost 50% of all foodborne illness outbreaks. We conducted an observational study of diners' handwashing behaviors in restaurant restrooms in terms of gender, handwashing signage, sink cleanliness conditions, and time. Our goal was to explore predictors of proper handwashing behaviors to promote better handwashing compliance.

Literature Review

We reviewed all academic articles published from 1990 to 2011 relating to handwashing studies. Among those we found 36 published manuscripts, mainly in university/school settings (Anderson et al., 2008; Drankiewicz & Dundes, 2003; Guinan & McGuckin, 2006; Thrumma, Aiello, & Foxman, 2008); in public restrooms (Johnson et al., 2003; Judah et al., 2009) and in hospitals (Harris et al., 2000; Larson et al., 2000; Yildiz & Savaser, 2010). Among those 36, we found only four conducted in restaurant settings (Allwood et al., 2004; Green et al., 2006; Pilling et al., 2009; Strohbelm et al., 2008).

A self-reported study in 2009 and 2010 showed that 94% (N=2,516) and 96% (N=1,006) of respondents suggest they always wash their hands after using a public restroom (Are Americans, 2009; Survey of Handwashing Behavior, 2010). Several researchers questioned the validity of self-reported handwashing data, and conducted observational studies that established much lower compliance rates, 74% and 85% respectively, in six North American airports (N=4,046) (Another U.S. Airport Travel Hazard, 2003) and in public restrooms (N=6,028) (Harris Interactive, 2010).

Some studies found gender difference with women washing their hands more frequently than men. In a multi-year study across public attractions, the average observed handwashing

rates for women were always higher than for men, with 93% *versus* 77% in 2010, 88% *vs*. 66%, in 2007 and 90% *vs.* 75% in 2005 (Survey of Handwashing Behavior, 2010). Anderson et al. (2008) found among 1400 college students, that 59% of female students and 32% of male students washed their hands after using restrooms.

Our literature review suggested many studies did not differentiate between proper handwashing and a lesser-level of handwashing (e.g., merely wetting hands). This is important as Burton et al. (2011; N=480) found that handwashing with non-antibacterial soap and water is more effective for removing potential fecal-origin bacteria from hands than handwashing with water alone. CDC recommends 15 to 20 seconds of washing and lathering hands, but no observational and self-reported studies attempted to measure the length of time of handwashing. Few studies also examined whether respondents used proper drying methods. A study by Scott and Vanick (2007) in the context of a residential college campus (N=994) showed that 33% of respondents did not dry their hands after washing. From the research, it is evident there is room for improvement in handwashing practices, and that additional research is necessary for a clearer understanding of how handwashing behaviors can be influenced by environmental factors within restrooms.

Methods

Direct and unobtrusive observations of handwashing behaviors were conducted in restrooms, located in various segments of restaurants. All observations were recorded according to a coding form comprising subject ID, date, subject's age group, observation time, gender, handwashing behaviors (no washing, wetting hands without soap, washing hands with soaps, the type and availability of drying mechanisms (not available, hot air, paper towel, or both, types of establishments, type of faucet (standard faucet *vs.* motion detection), and sink cleanliness.

Results

Of all subjects (1,006 diners) observed, approximately 69.3% were women. Approximately 53.4 % of subjects engaged in proper handwashing behavior, i.e., handwashing with soap and using a paper towel or hot air to dry their hands. About 33.5% of subjects attempted to wash their hands (wetting hands without soap), while 12.3% of subjects did not wash their hands at all after using the restroom. While CDC recommends rubbing hands for 15 to 20 seconds before rinsing thoroughly, average handwashing time observed was 6.6 (SD= 4.3) seconds.

Chi-square analysis revealed statistically significant differences of handwashing behaviors in time of observation, gender, sink conditions, and handwashing sign. In terms of the length of washing time, significant differences were found in gender, age group, establishment types, and sink condition. Gender difference was confirmed in the study, with women engaging in proper handwashing behavior significantly more than men. Handwashing signage was shown to be an effective intervention method, because subjects significantly engaged in proper handwashing when handwashing signage was available, compared to when no signage was present.

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