Effect of involuntary motivational factors on hand hygiene by health care providers

Nazari R, Seyed Abdolmotaleb Hasani, Sima Khazaeinejad

Abstract

Background and Purpose: Hand hygiene is a low-cost, convenient measure recommended to all health care providers to prevent nosocomial infections. Health care staff commonly neglect the importance of hand washing at workplace. This study aimed to evaluate the effect of involuntary motivational factors on hand hygiene compliance by health care providers.

Methods: This descriptive analytical study was conducted on 153 health care providers selected via simple random sampling. Data were collected using questionnaires designed based on the theory of planned behavior (TPB). Data analysis was performed in SPSS, using descriptive and inferential statistics, Pearson's correlation-coefficient and T-test.

Results: In 80.40% of cases, participants reported that they washed their hands after contact with patients or hospital equipment. Moreover, participants had a positive attitude towards the consequences of hand washing (6.11±0.8) and considered this behavior as a norm (6.12±1.2). Correlations observed between most variables of study were significant (P≤0.001). However, controlling factors had a less significant effect on hand hygiene intention compared to other variables, such as outcome evaluation, subjective beliefs and normative beliefs of participants (P≤0.001).

Conclusion: According to the results of this study, health care providers have a positive attitude towards hand hygiene compliance. However, due to the impact of involuntary motivational factors on this behavior, it is necessary that medical authorities identify major strategies for behavioral change of health care staff through predicting these underlying factors.

Keywords: Hand hygiene, Health care providers, Motivational factors

Introduction

Nosocomial infections are considered as a significant threat to patient safety imposing high costs on healthcare system (1). According to statistics, nosocomial infections affect two million people every year, and 19 million die due to these infections (2). Nosocomial infections, also known as hospital-acquired infections, increase treatment costs and average length of hospital stay by 5-7 days. In one study, Akyol reported the transmission of microorganisms from caregivers’ hands as the main source of hospital-acquired infections (3).

Hand washing is the most effective way to prevent nosocomial infections. Hand hygiene compliance is recommended to all health care providers as a convenient, inexpensive measure, as well as the first step to control infections (4, 5).

Previous research has indicated that health care providers are not accustomed to hand washing as expected (6). Instructions at every medical center urge health care staff to wash their hands with soap...
and water, chlorhexidine gluconate and alcoholic
gel before and after contact with patients or hospital
equipment (7). Nonetheless, health care staff are
often unaware of the importance of hand hygiene
and assume it to be necessary only after contact
with patients or contaminated equipment (3).

In Iran, studies have indicated that standard hand
hygiene compliance is relatively unfavorable in
hospitals. Similar to international studies, adherence
of health staff to hand hygiene standards in our
country has been reported to be 30-50\% (8, 9).

According to the literature, some of the factors
involved in negligence of hand hygiene by health
care staff are stimulant properties of disinfectants,
lack of hand washing habit, laziness and lack of
awareness, high work pressure, insufficient facilities
(e.g., disposable towels) and disregard of nursing
management (10). It must be noted that human
behavior has a complex pattern and is the result of
internal, biological, environmental, educational and
cultural interactions of individuals (11).

Behaviors revolving around personal hygiene
are affected by individual experience, attitude
and occupational requirements (4). Involuntarily
motivational factors influencing hand hygiene
behavior could be predicted and evaluated. In this
regard, causes of hand hygiene negligence should be
identified among caregivers, and effective strategies
should be established to change current behavioral
patterns.

In recent years, psychological studies have
investigated influential factors in the behavior of
health care professionals (12). Several theories
have been proposed on predicting and changing
behavioral patterns in these individuals; such
example is the theory of planned behavior (TPB),
which is based on a cognitive approach (13, 14).

TPB is applicable in situations where individuals
have control over their behaviors and all
circumstances related to their behaviors. According
to this theory, three main variables of attitude,
perceived behavioral control and subjective norms
are involved in the development of a specific
behavior (12).

Given the importance of hand hygiene for hospital
staff, and considering that only a few studies have
evaluated standard hand hygiene behavior of
health care professionals in Iran, this study aimed
to evaluate hand hygiene compliance using TPB.
Furthermore, we aimed to describe the internal
components of this behavior (e.g., attitude, norms,
tendencies and controlling factors) based on TPB,
as well as to identify involuntary motivational
factors affecting hand hygiene observation among
health care staff.

Materials and methods

This cross-sectional study was conducted on 153
health care providers including nurses, physicians
and other therapists. Participants were selected via
simple random sampling from staff of 17-Shahrivar
Hospital in Amol, Iran. Informed consent was
obtained from participants, and data were collected
using questionnaires designed based on TPB.
Questionnaires were extracted from the edited version

With the study population of 270 participants,
sample size was determined based on Morgan’s table.
Reliability of questionnaires was calculated using
Cronbach’s alpha coefficient (α=0.84).

Questionnaires consisted of two main sections:
First section focused on demographic characteristics
of participants, including age, sex, ward of
employment and clinical experience. Second part of
the questionnaire had 46 items to measure underlying
variables of TPB (i.e., involuntary motivational
factors), which were scored on a seven-point Likert
scale. Variables measured in questionnaires were as
follows:
1) Outcome evaluation: This category had six
questions to assess the opinion of participants about
the outcome of hand hygiene compliance before
and after contact with patients (score range: 1=poor,
7=satisfactory).
2) Motivation to comply: This category had four
questions to evaluate the opinion of participants on
frequency of compliance with recommendations
on hand hygiene standards (score range: 1=never,
7=always).
3) Behavioral beliefs: This category had seven
questions to assess the opinion of participants
about the usefulness of hand hygiene compliance in patient care (score range: 1=extremely low, 7=extremely high).

4) Controlling factors: This category had six questions to evaluate controlling factors for hand hygiene compliance by health care staff (1=rare, 7=frequent).

5) Impact of controlling factors: This category had six questions to assess the opinion of participants about the impact of controlling factors on hand hygiene observation (1=strongly disagree, 7=strongly agree).

6) Normative beliefs: This category had three questions to evaluate the opinion of participants about common normative beliefs regarding hand hygiene observation (1=not true, 7=totally true).

7) Attitude towards hand hygiene: This category had six questions to assess the attitude of health care staff towards hand hygiene behavior (1=strongly disagree, 7=strongly agree).

8) Subjective norms: This category had five questions to evaluate the beliefs of participants about norms and standards of hand hygiene observation (1=absolutely false, 7=absolutely true).

9) Intention for hand hygiene compliance: This category had three questions to assess the intention of participants for hand washing before and after contact with patients (1=poor, 7=satisfactory).

After questionnaires, we used self-reports to evaluate participants in terms of frequency of hand washing only before, only after, and both before and after contact with patients. Total scores of participants were calculated within a score range of 1-7, and mean of total scores was used to determine the effect of underlying variables (i.e., involuntary motivational factors) on hand hygiene compliance (14). Participants were given accurate instructions for completing the questionnaires and were assured of confidentiality terms as well.

Data analysis was performed in SPSS V.16 (SPSS Inc., Chicago, IL, USA) using descriptive (mean and standard deviation) and inferential statistics (Pearson’s correlation-coefficient and independent T-test), and P value of less than 0.05 was considered significant.

Results

In this study, 125 participants (81.7%) were female, and others were male. Mean age of participants was 29.28±8.24 years. Wards of employment for health care providers enrolled in this study are shown in Table 1. According to self-reports, participants washed their hands in 52.29% (SD=29.36) of cases only before, in 80.40% (SD=21.59) of cases only after, and in 55.64% (SD=29.84) of cases both before and after contact with patients.

Correlations between underlying factors and attitude of health care providers towards hand hygiene compliance are presented in Table 2. Mean score obtained for each involuntary motivational factor was indicative of a positive attitude towards hand hygiene observation in the majority of participants. Moreover, they accepted hand washing before and after contact with patients as a norm in medical practice (score: 6.12±1.20).

In this study, participants partly believed in controlling factors for standard hand hygiene (5.31±1.20), while only a few confirmed the impact of these factors on compliance with hand hygiene standards (4.44±1.40). The information in Table 2, was show relation between involuntary motivational factors in health care providers.

Regarding outcome evaluation, we observed a significant correlation between normative beliefs of participants (r=0.619) and subjective norms about hand hygiene standards (r=0.608). However, correlation between the incentive of participants and their intention to comply with hand hygiene standards was not significant (r=0.133).

Although viewpoint of our participants regarding the impact of controlling factors was correlated with their normative beliefs (r=0.086), this correlation

<table>
<thead>
<tr>
<th>Ward</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternity</td>
<td>14</td>
<td>9.2</td>
</tr>
<tr>
<td>ICU*</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Surgery</td>
<td>32</td>
<td>20.9</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>15</td>
<td>9.8</td>
</tr>
<tr>
<td>Internal</td>
<td>16</td>
<td>10.4</td>
</tr>
<tr>
<td>Dialysis</td>
<td>17</td>
<td>11.1</td>
</tr>
<tr>
<td>Emergency</td>
<td>36</td>
<td>23.5</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>100</td>
</tr>
</tbody>
</table>

*ICU: Intensive Care Unit
was not statistically significant (P>0.05). Finally, no significant difference was observed between involuntary motivational factors affecting hand hygiene behavior and parameters such as age, sex and ward of employment (P>0.05).

Discussion

According to the results of this study, health care providers had a positive attitude towards the consequences of hand hygiene and considered this health measure as a norm in patient care. Our participants believed that correct hand washing could prevent the transmission of infections to themselves, patients and even their family members. In addition, they stated that adherence to standard hand hygiene resulted in a feeling of satisfaction at workplace. In their viewpoint, hand hygiene was not an entirely personal matter, and possible consequences could affect other people as well. Therefore, it seemed logical that others expect health care staff to wash their hands before and after contact with patients to optimize their medical performance.

One study conducted in this regard highlighted the need for continuous and dynamic monitoring of hand hygiene compliance among health care providers (6). According to the participants, factors such as unforeseen events, fatigue, boredom, crowded wards, personal concerns and lack of adequate facilities for hand washing (i.e., controlling factors) could discourage health care staff from regular hand washing. However, impact of these factors was not considered significant by the participants. This point of view has been shared by many health care staff, such as nurses, in similar studies.

In another research, some of the controlling factors for hand hygiene compliance were reported to be the use of undesirable disinfectants and hand washing liquid, lack of hand washing habit, laziness and impatience, lack of awareness, negligence, high work pressure and lack of desirable facilities for hand washing (e.g., disposable towels) (10).

In one study performed in Turkey, while nurses respected the need for hand hygiene compliance, they were occasionally unable to wash their hands due to heavy workload, lack of adequate facilities for drying hands and hand ulceration caused by repeated washing (3). According to the results obtained by White et al., the main reasons for failure to comply with hand hygiene standards were negligence, forgetfulness and lack of time (13).

In another study, Ravaghi et al. reported that factors such as insufficient resources, heavy workload and poor physical infrastructure of hospital wards were the most significant environment-related obstacles against hand hygiene compliance (5). In this respect, adequate resources need to be provided, and appropriate training is also required in order to motivate health care staff for this particular behavior. Moreover, effective strategies need to be implemented to reduce the effect of time constraints in compliance with hand hygiene standards.

According to the findings of the present study, although motivation was an important factor in hand hygiene observation, it had no significant correlation with intention of health staff to adhere to

### Table 2. Effect of involuntary motivational factors on hand hygiene compliance based on Pearson’s correlation-coefficient

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome Evaluation</td>
<td>6.11</td>
<td>0.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation to Comply</td>
<td>5.8</td>
<td>1.27</td>
<td>0.292*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral Beliefs</td>
<td>5.9</td>
<td>1.1</td>
<td>0.564*</td>
<td>0.370</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Controlling Factors</td>
<td>5.31</td>
<td>1.2</td>
<td>0.280*</td>
<td>0.170*</td>
<td>0.323*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of Controlling Factors</td>
<td>4.44</td>
<td>1.4</td>
<td>0.223*</td>
<td>0.166*</td>
<td>0.377*</td>
<td>0.488*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td>6.12</td>
<td>1.2</td>
<td>0.608*</td>
<td>0.391*</td>
<td>0.426*</td>
<td>0.293*</td>
<td>0.086*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Attitude</td>
<td>5.1</td>
<td>1</td>
<td>0.513*</td>
<td>0.269*</td>
<td>0.468*</td>
<td>0.418*</td>
<td>0.350*</td>
<td>0.491*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective Beliefs</td>
<td>5.8</td>
<td>0.86</td>
<td>0.619*</td>
<td>0.450*</td>
<td>0.606*</td>
<td>0.437*</td>
<td>0.314*</td>
<td>0.577*</td>
<td>0.599*</td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>5.4</td>
<td>0.93</td>
<td>0.436*</td>
<td>0.133*</td>
<td>0.459*</td>
<td>0.368*</td>
<td>0.362*</td>
<td>0.255*</td>
<td>0.516*</td>
<td>0.591*</td>
</tr>
</tbody>
</table>

* P≤0.001; † P≤0.050; * Not significant
hand hygiene standards. As such, individuals were more likely to observe personal hand hygiene if advised by a colleague, professor or family member.

In a study by Pittet et al., it was observed that nurses considered physicians as role models in principles for infection control, including hand hygiene (15). Therefore, it could be concluded that senior authorities play a pivotal role in the promotion of health behaviors among staff at medical systems.

In this regard, Creedon suggested that medical authorities were frequently unwilling to follow global guidelines on personal hygiene (16). On the other hand, Ott and French claimed that authorities lacked enough motivation to change inappropriate personal hygiene behaviors (4). This seems to be caused by the complexity of hand washing habits, as well as internal beliefs of individuals, which are influenced by the several parameters, such as environment, education status and cultural background.

Results obtained by Smiddy et al. indicated that motivational and environment-related factors at workplace had a significant effect on hand hygiene behavior of health care staff (17). According to our findings, motivation to comply had the least significant correlation with the participants hand hygiene intention. This denotes that priority of hand hygiene and intention towards this behavior cannot be predicted only based on the motivation of individuals to follow instructions. This issue could be due to the complexity of human behavior, especially change of habits for more appropriate behaviors.

One of the most important findings of the current study was that our participants washed their hands more frequently after contact with patients. In other studies, health care providers reported that they washed their hands after contact with patients, environment and hospital equipment (3, 18). Therefore, it could be concluded that they were more concerned with controlling disease transmission from patients than prevention of infections. Nevertheless, hand washing both before and after contact with patients and hospital equipment has been strongly recommended for the prevention and control of infections (18-20).

Conclusion

In conclusion, although our participants had a positive attitude towards hand hygiene observation, several factors influenced their compliance with principles of this behavior. Considering the complexity of human behavior and impact of involuntary motivational factors on individual intentions, it is recommended that multilateral strategies be implemented as to promote hand hygiene compliance among health care providers.

Conflict of interest

None declared.

Authors’ contributions

R Nazari contributed to study design, data collection, and manuscript drafting; SA Hasani helped with data collection, and manuscript drafting; S Khazaeinejad assisted with data collection and entering the data into the software.

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