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## Major article

## Barriers to standard precautions adherence in a dental school in Iran: A qualitative study

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**Background:** Setting up good infection control practices in educational institutions is crucial in shaping future health professionals. The implementation of standard precautions (SPs) in Iranian dental schools has not been explored qualitatively to identify barriers to good practice.

**Methods:** Twelve focus group discussions and 8 semistructured interviews were conducted with students, residents, and staff members ( $n = 83$ ) of the Shiraz University of Medical Sciences Dental School. The interview guide addressed performance, subjective norms, and behavioral control domains of SP-related behaviors. Thematic analysis was performed manually to identify barriers to SP practices.

**Results:** Proximal factors of poor SP adherence were a lack of knowledge and technical difficulties. These factors were compounded by intermediate factors in the work environment: lack of facilities, heavy workload, patient expectations, interprofessional conflicts, and lack of good role models. Two underlying distal factors were financial issues and unsupportive organizational culture. The social constructionism theory was useful in analyzing the situation and suggesting an educational approach as part of the solution.

**Conclusion:** Complex and intertwined barriers of SP adherence were found in this dental school. A social construction approach may assist in addressing these problems by shifting the culture through education to construct a contextual new knowledge. Further research in medical sociology of SP practices would be useful.

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Dental health care workers (DHCWs) are at risk for occupational acquisition of infectious diseases because they are routinely exposed to body fluids and perform invasive procedures with sharp instruments more often than doctors and nurses.<sup>1,2</sup> Infection transmission in dental procedures may occur via direct contact with blood, saliva, aerosols, tissue and infected particles, or sharp instruments.<sup>3</sup> Most of these exposures are preventable by good infection control practice, including strict adherence to standard precautions (SPs).<sup>4-6</sup> SPs prevents direct contact with blood, body fluids' secretions and excretions, nonintact skin, and mucous

membranes<sup>1</sup> and should always be used when body fluid exposure may happen.<sup>5</sup>

Despite extensive improvements in infection control procedures, SPs are poorly practiced by DHCWs in Iran,<sup>7</sup> and there remain serious breaches and barriers to adherence by dental schools, clinics, and offices.<sup>8</sup> The importance of dental schools in training students on infection control measures has been highlighted,<sup>9</sup> but so have challenges, such as cost,<sup>10</sup> poor role modeling by senior practitioners, and a lack of SP monitoring and evaluation.<sup>8,11</sup> Finally, although education and training may fill some knowledge gaps,<sup>6,12</sup> compliance to SPs is multifactorial<sup>11,13</sup>; therefore, clinical practice may still deviate from guidelines.<sup>14</sup> This may lead to unnecessary additional precautions while neglecting routine SPs.<sup>6,14</sup>

In order to design effective and appropriate strategies to improve Iranian DHCWs' adherence to SPs, we conducted a study to explore the barriers of SP practices among students, residents, and faculty members of an Iranian dental school.

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## MATERIALS AND METHOD

This study was conducted at the Dental School of Shiraz University of Medical Sciences. Because many of the factors influencing DHCWs' compliance to SP are subjective, a qualitative exploratory design was chosen for this study in order to obtain an in-depth understanding of human nature and social construction.<sup>15-17</sup> Data were collected from separate focus group discussions (FGDs) of students, residents, and faculty members. In-depth interviews were conducted with faculty members who could not attend FGDs because of time constraints or who would prefer to speak individually. Students who had completed the third year of education and residents at all levels were eligible if they had worked in clinical wards. Faculty members were eligible if they had at least 2 years of teaching experience.

Each FGD consisted of 6-7 participants, lasted about 1 hour, and was conducted by the same moderator and notetaker. The FGD questions were constructed to elicit participants' experiences of barriers in infection control strategies in dental practice. The questions addressed 3 domains: performance, subjective norms, and behavioral control, which were considered the main influences of behaviors.<sup>18</sup> Probing questions were asked when necessary to expand participants' responses. In-depth interviews were done individually using a semistructured interview guide that was similar to the FGD questions.

Recruitment for FGDs and in-depth interviews was done until data saturation was achieved, where the last FGD session and interview did not add any new information to the data.

All FGDs and interviews were voice recorded and transcribed verbatim. Thematic analysis was used to identify barriers and facilitators of SP compliance. The transcripts were coded separately by 2 persons. Four persons categorized the open codes and extracted themes separately; the themes were discussed together to achieve consensus.

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences.

## RESULTS

Twelve FGDs and 8 semistructured interviews were conducted, with a total of 83 participants: 25 faculty members (15 women, 10 men), 26 residents (14 women, 12 men), and 32 students (20 women, 12 men). The overall, average age of the faculty members was 37.4 years; for residents the average age was 27.2 years, and for students it was 23.3 years (Table 1). Eight faculty members participated in the interviews (5 men, 3 women; age, 37-52 years with a mean of 43.1 years).

Factors related to SP adherence could be mapped into proximal, intermediate, and distal factors (Fig 1). The proximal factors were a lack of infection control knowledge and technical difficulties to implement SP. These factors were compounded by intermediate factors in the work environment, namely a lack of facilities, heavy workload, patients' expectations, interprofessional conflicts, and lack of good role models. Distal factors underlying these barriers were financial issues and unsupportive organizational culture.

### Proximal factors of SP nonadherence

In general, the respondents reported an acceptable knowledge of SP, but they admitted a lack of awareness in some aspects of infection control. The lack of knowledge was identified in a student's reflection: "Students think that HIV [human immunodeficiency virus] and hepatitis viruses do not survive in the environment...students are fairly confident they are immune to

**Table 1**  
Demographic profile of the participants

Category	Range	Mean $\pm$ SD	Median
Faculty members			
Age (y)	28-54	37.4 $\pm$ 8.6	36
Professional experience (y)	2-25	14.6 $\pm$ 9.3	9
Residents			
Age (y)	24-33	27.2 $\pm$ 3.1	27
Professional experience (y)	1-4	2.2 $\pm$ 1.3	2.5
Students			
Age (y)	22-28	23.3 $\pm$ 1.8	24
Professional experience (y)	3-7	5.3 $\pm$ 2.3	5

infection." A staff member expressed their belief that wearing gloves negate the need for hand hygiene.

Respondents who were aware of the need for SPs reported technical difficulties to adherence because of nursing staff shortage, students needing to take notes while working, and heavy academic load leading to tiredness and high stress level. As a result, good practices, such as 4-hand dentistry and glove changing between procedures, were not fully implemented.

### Intermediate factors of SP nonadherence

Respondents reported that SP implementation was further compounded by a lack of facilities provision and maintenance. Instruments were sometimes inappropriately cleaned and disinfected, and autoclaves were not regularly tested and calibrated. A resident reported: "Instrument trays are often incomplete; for example hand pieces are present in only 30%-40% [of trays]. Only one wrench is available in periodontics [and it] must be repeatedly disinfected with Deconex." Hand hygiene was hampered by a lack of pedal-type handwashing sinks and low-quality soap that was harsh to the hands. A student recounted a series of daily problems:

"Students are reprimanded if they change their gloves and masks frequently. Students have very limited storage space; extracted teeth used in pre-clinical classes must be kept in student lockers. Casts are often contaminated; however, students must store them in their lockers along with uniforms, backpacks and clothes."

Against this backdrop, students and clinicians were faced with a heavy workload that led to further nonadherence of SPs. Staff members rushed between departments and may not have had time to properly reprocess instruments. Students reported feeling pressured to work faster, and a faculty member lamented that "quality is sacrificed for quantity." Patient expectation put additional barriers to SP adherence as explained by a resident:

"Patients expect to be treated quickly and without pain...Dentists who work quickly are more acceptable than those who observe infection prevention carefully, and dentists think that learning practical skills is more important than adherence to infection prevention."

Some respondents reported another SP barrier from interprofessional conflicts. Students' SP practices were sometimes protested and scoffed by dental nurses; nursing office personnel sometimes refused to release materials and equipment necessary for SPs; and students reported conflicting instructions about SPs from nurses. Respondents who reported these incidents contended that the nursing staff's lack of infection control awareness and training may have been the root cause of these conflicts.

Students and residents reported a lack of good role models in SP adherence. Senior clinicians were reported to have poor adherence

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