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Observed Use of Standard Precautions in Chilean Community Clinics

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Abstract

Objective—In Chile, little information about the use of standard precautions (SP) among health care workers (HCWs) exists. As part of a larger study to tailor and test an HIV prevention intervention for community HCWs, this study describes the observed frequency with which appropriate SP were used by HCWs in low-income community clinics of Santiago. Also, the availability of supplies is described.

Sample—A total of 52 structured observations with potential contamination with body fluids were done.

Results—HCWs used SP inconsistently, especially neglecting hand washing, surface cleaning, and cleaning of shared materials. Lack of materials contributed in some instances of failure to use SPs, especially wiping surfaces and safe disposal of sharp instruments, as shown by a positive correlation between use of SP and availability of materials. Essential materials were usually available. Although more education should relate to a better understanding of the importance of SP, no difference was found between professionals and paraprofessionals in the use of SP.

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Conclusions—It is clear that the initial training, continuing education, and ongoing support for practicing SP are not adequate. Training should be offered to HCWs involved in caring for clients at community clinics to stop the spread of HIV or other infectious diseases in health care settings.

Keywords

Chile; community clinics; health care workers; standard precautions

Stopping the spread of infectious diseases in health care settings should be a priority for health care workers (HCWs) (Chalmers & Straub, 2006). The U.S. Center for Disease Control (CDC) recommends standard precautions (SP) to reduce the risk that HCWs face of acquiring HIV in their work place (Beekmann & Henderson, 2005). The United Nations Joint Programme on HIV/AIDS (UNAIDS) suggests that HCW are key actors in stopping spread of HIV (UNAIDS, 2000, 2002). Nonetheless, in Chile, there is little information about the use of SP among HCWs. This study provides information previously unavailable in Chile about the observed frequency with which correct and appropriate SP were used by HCWs and whether they had the essential supplies needed to do so in Chilean community clinics.

According to the CDC and the Chilean Ministry of Health, SP should include at a minimum hand washing, gloves use, safe use of sharps instruments, and cleaning of surfaces and shared equipment for all procedures that may involve exposure to body fluids (CDC, 1999, 2005, 2006; Comisión Nacional del SIDA [CONASIDA], 2000). The use of SP is recommended because it is impossible to identify all those patients who are living with HIV, and routine HIV testing is more expensive than consistently practicing SP (Kermode, Holmes, Langkham, Thomas, & Gifford, 2005). Unfortunately, compliance with SP among HCWs remains low in both developing and developed countries (Asai, Masuzawa, & Shingu, 2006; Danchaivijitr et al., 1995; Menon & Bharucha, 1994; Stein, Makarawo, & Ahmad, 2003). The lack of accurate use of SP is also reported in Chile (Mendoza, Barrientos, Vasquez, & Panizza, 2001).

Factors related to compliance

A number of factors have been identified as contributing to HCWs' compliance with SP, including lack of materials, fears about transmission, stigmatization of HIV and AIDS, and lack of clear policies. Poor adherence to SP sometimes can be attributed to *lack of materials* (Aisien & Shobowale, 2005). In order to practice SP, HCWs require access to essential supplies such as soap, towel, sharps containers, and disinfectants. Chile is a medium-income country with a well established national health care system. Availability of resources in health care settings is no longer regarded as a problem by the Ministry of Health. Most HCWs have had at least some training that included use of SP.

Fears about occupational transmission of HIV may have a significant impact on the use of SP (Ansa, Udoma, Umoh, & Anah, 2002). For instance, appropriate use of SP significantly correlates with HCWs perceived risk of exposure (positively correlated), the belief that HIV is easy to "catch" (negatively correlated), and the extent of the HCWs involvement with HIV-infected patients (positively correlated) (Beekmann & Henderson, 2005). *Stigma and*

discrimination toward persons living with HIV may also contribute to both exaggerated fears of possible infection and inappropriate SP use. Studies of HIV-related discrimination reveal continuing concerns about the attitudes and behavior of HCWs, particularly with reference to practices such as excessive or selective use of infection control (Bermingham & Kippax, 1998). Negative attitudes toward HIV-positive patients are also noted and might be related to SP misinformation. In Chile, HCWs living with HIV are transferred to clerical positions, a security strategy beyond what is recommended by SP (Foreman, 2003). Alves and Ramos (2002) also identified negative impacts of stigma on the providing of safe and compassionate care in Brazil.

Lack of clear *health policies* regarding HIV prevention may also contribute to the lack of use of SP. For example, in 2002 in South Africa, a country with comparable health resource characteristics, Ogunbodede and Rudolph (2002) found that HCWs report no existence of *health policies* for HIV/AIDS prevention in their health care institutions. A similar lack of policies and procedures has been reported in personal communications with Chilean HCWs. Worldwide, there is an urgent need to train HCWs about the true risk of occupational HIV infection and how to prevent it (Dodge et al., 2001; Ezedinachi et al., 2002; Hentgen, Jaureguiberry, Ramiliarisoa, Andrianantoandro, & Belec, 2002).

Standard precautions in Chile

As previously stated, in Chile there is almost no information available on the use of SP by HCWs. Chile has a mixed private and national health care system with strong primary health care installed in community clinics that serve Chileans ascribed to the public system. Community clinics provide basic and advanced care; therefore, it is critical to have health workers trained and involved in the use of SP for their own and their clients' protection. Community clinics in Chile provide primary health care to all Chileans who belong to the public health care system and are expected to provide good quality care centered on prevention as well as treatment of diseases.

A Chilean study (Mendoza et al., 2001) assessed the risk of exposure to high risk fluids in a pediatric hospital of Santiago. They examined the type of personnel exposed, exposure situation, and behavior of HCWs. The investigators found that the main exposure situation was during percutaneous procedures, where HCWs suffered puncture with contaminated needles or glasses. The most frequently exposed HCWs were nurses, followed by nurse auxiliaries and paramedics. Paramedics are a category of paraprofessional HCWs in Chile who receive 12–24 months of training and perform a wide variety of tasks in the clinics, including phlebotomies, simple wound care, and vital sign checkups, among others. Almost 30% of the exposure situations were related to inappropriate disposal of sharp materials, and in 60% of the cases no gloves were used (Mendoza et al., 2001). According to data from Chilean government, as of 2000 no HCWs were identified as HIV positive after occupational exposure, but it is recognized that this information might be hidden because of the poor notification of accidents with sharps instruments (CONASIDA, 2000).

The purpose of this study is to describe the extent to which SPs are used and the essential supplies available for SP in community clinics in Santiago, Chile. This study was conducted

as part of a larger study to adapt an HIV prevention intervention for Chilean community health workers and then test the effectiveness of the intervention in increasing their HIV prevention knowledge, attitudes, and practices (Grant # 1 R03 TW006980, K. F. Norr, PI). The purpose of these observations was to identify current behaviors of HCW while providing direct care in order to tailor the intervention to the participants' needs as reflected in their current practices.

Methods

Design and sample

This observational study took place in two municipalities of Santiago, Chile during 2005. The study was conducted in 10 low-income community clinics located in La Pintana and Puente Alto. At the 10 community clinics, services are provided to people registered according to their address. Each municipality provides funding for the clinics within their geographic area, and the clinics provide primary care for its residents. However, all the clinics follow policies regarding their services coming from the Ministry of Health. It is important to mention that the observed community clinics serve nearly 350,000 Chileans, representing more than 5% of the population of Santiago. These areas are considered to be two of the most socioeconomically disadvantaged communities of Santiago, with high incidences of drug use, adolescent pregnancy, and sexually transmitted infections (CONACE, 2006; CONASIDA, 2000).

Data for this research came from observations in the 10 clinics selected for the study. Five clinics were selected in each municipality, since they work in the traditional system of primary health care clinic, and have not changed to a family health care center yet. One center in each clinic in each municipality has transitioned already and works differently. All clinics offered basic primary care, including prenatal and well child services and diagnosis and treatment of illnesses. Larger clinics also had services such as dental care, physical therapy, etc. HCWs were eligible for observations if they satisfied inclusion criteria of: (1) working at least 22 hr/week at the community clinic, (2) being employed by the health care center directly rather than through an outside agency, and (3) having direct contact with clients. HCW were both professionals and paraprofessionals who daily confront potential contamination with body fluids.

A total of 107 structured observations of 39 health worker-client encounters were done, including both those offering direct care and those in support services. For 52 of these observations, there was potential contamination with body fluids. A total of 52 observations were done when potential contamination was present in the contexts of wound care, lab tests, or physical examination. Thirty HCWs were observed in these 52 situations requiring the use of SP. Seventeen of them were observed once, 7 were observed twice, 3 were observed three times, and 3 were observed four times. Out of the 52 observations that required use of SP, 21 (40.4%) were of paramedics and 31 were of professionals (2 with a physician, 10 with a midwife, 6 with a nurse, and 13 with a dentist).

Before starting data collection, this project was approved by the Office for the Protection of Research Subjects from the University of Illinois at Chicago and the Ethics Committee from

the Pontificia Universidad Católica de Chile. Recruitment of participants at the community clinics consisted of having trained members of the research team personally inviting HCW to participate in the project during a regular working day. We first obtained permission from the clinic administrators. Then we explained the observation's purpose and procedure to each HCW privately. HCWs were not told that the observation would take place until that day to reduce anxiety beforehand. All contacted HCW agreed to be observed and signed an informed consent form. We had no refusals. The HCWs may have felt that they could not refuse because this project was supported by the clinic administrator, despite assurances that the administrators would not be told who did or did not participate. The reassurance that the observations were anonymous, with no names noted, and that only summary data would be reported, may also have encouraged participation. Before each observation with a new client, the observer introduced herself and the purpose of the study, explained what would be observed, including the information that neither provider nor client names would be noted, and then asked if the client was willing to be observed. The study protocol included observer breaks so that clinic personnel would not know whether observation had stopped because the observers wanted a break or either the client or HCW had declined to participate. No refusal occurred and participants were eager to have a study like this occur in their community clinic.

The observations took place in the 10 participating clinics. We planned the observations to occur on different days and different parts of the clinic. HCWs were observed during an interaction with a client of no <10 min. Examination and consultations occurred in private exam rooms. Laboratory tests and wound care often took place in semiprivate cubicles with a common supply area in the back. There were five observers who were trained to reliability as described above before the commencement of data collection. They were experienced nurses familiar with the Chilean health care system. None of them worked at the clinics or knew any of the HCWs being observed before the study. Four were university faculty and one was the project manager.

Measures

A structured form was used to record the observations and type of encounter. The first sections identified the HCW health care center, occupation, sex, and type of encounter. The section on the use of SP and availability of essential materials was used for these analyses. Other sections of the observation form not discussed in this analysis examined the interaction with the client and client teaching. SP was defined as including hand washing, glove use, surface cleaning, and manipulation of sharps and shared instruments such as scissors. For the SP, all items were coded as done correctly, not done, or not applicable for that encounter (e.g., if no needle or other sharp instrument was used, there was no need to dispose of a sharp object correctly). Thus, each individual item was a ratio-level dichotomy. In addition, we assessed the availability of essential supplies in an adequate amount for the number of clients needed to perform these SPs, including soap, disposable towels, sharps container, and disinfectants. The supplies were rated as present or not present at the point of use where the observation occurred. We also noted the type of soap (liquid or tablet) and towel (disposable or reused). Because many clinics were not using standard sharps containers we also noted when an improvised container was used. These practices and

available supplies were based on the recommendations of both the CDC and the Chilean Ministry of Health (CDC, 1999; CONASIDA, 2000). Measures and their definitions are listed in Table 1. Other sections not presented in this analysis examined the interaction with the client and client teaching.

This instrument was adapted from an observation tool originally developed for a previous study of health workers in Malawi, with an interobserver reliability coefficient of .85 (Norr et al., 2006). Major changes included removal of items not relevant to a clinic setting with basic resources in place, and addition of several items, including using gloves with both hands and observing the cleaning of surfaces when visibly soiled with body fluids as well as between patients. Before using this instrument it was translated with back and forward translation and piloted in Chile. Double observations were done to establish clear definitions of all the items and obtain consensus in ratings; that is, a reliability of 1.00 was established between raters before the data collection began.

Analytic strategy

Qualitative data were gathered between April, May, and August of 2005. For facilitating the processes of analysis, data storage, and retrieval, a database was developed using the statistical software SPSS version 12. Data about the use of SP were analyzed using descriptive statistics calculating frequencies, standard deviations, ranges, and means. Statistical significance was set at $p<.05$ for the Pearson's analysis conducted to assess the correlation between the use of SP and availability of resources in the clinic.

As noted above, some of the observations were of the same HCW with different clients. Careful examination of the multiple observations of the same health worker and the single-worker observations showed that there was as much variation between observations of the same worker as between different workers, because the situation was different. A Kruskal-Wallis test showed there was no significant difference ($p> .05$) between the groups of individuals observed, one, two, three, or four times. As a result, the unit of analysis was each observation. This seemed conceptually appropriate because it was the situation being observed that determined what SP were needed.

Results

As defined by CDC, SP should always be present when there is potential contamination with body fluids. When delivering care to a client in this situation, HCW ought to *wash hands* between patients and after glove removal with correct technique (CDC, 2006), use new *gloves* on both hands when in direct contact with a client, clean or disinfect *shared surfaces or materials*, and use and dispose of *sharp instruments* correctly.

Availability of materials

Availability of materials was observed at each community clinic by examining the presence of running water, soap, towels, gloves, sharps containers, and disinfectants in the room where the HCW-client encounter took place. At each clinic one nurse is in charge of supplies. All said their clinic had no problems in obtaining adequate supplies of all these materials including sharps containers and gloves. The only reported shortage was soap in the

exam room. HCWs reported having to personally provide soap for their exam rooms, because each room was stocked with only one 500 ml container for the whole month.

Considering resources required for *hand washing*, all patient contact areas had running water. Soap was available in 71.0% of the observations; however, we did not inquire if it was clinic supply or brought in by HCWs. When soap was available, it was liquid soap with an appropriate dispenser in 64.5% of the observations. Towels were available in 85.4% of the cases, but only 78.0% of the towels were disposable. In all encounters, *gloves* were available and HCWs could request additional gloves if needed. In 77.4% of the encounters a sharp *container* was available. However, almost 11.0% of observations used improvised containers, such as a glass bottle or can with a small opening on top. HCWs had a *disinfectant* available for disinfecting surfaces or shared materials only 56.0% of the times.

An overall score was calculated regarding the availability of four key resources: soap, towel, sharps container, and disinfectant. The possible range was 0–4. The mean was 3.2 (*SD* 0.9). In 20 different observed moments, the maximum score was reached; only one observed case had a score of 1, the lowest observed score.

Use of standard precautions

At each encounter with potential contamination with body fluids, we observed four elements of SP: hand washing, glove use, use and disposal of sharps instruments, and disinfection of surfaces and shared materials. Valid observations for each component are different, since some data were missing or not appropriate to be included.

Regarding *hand washing*, out of 52 valid observations, 47.1% did not wash hands before attending a client, 47% did not wash their hands after having contact with a risky fluid, and only 41.3% washed their hands immediately after removing gloves. When considering *glove use*, 89.8% used gloves when potentially in contact with blood or other risky body fluids. Almost 92% used new gloves for each client, and 89.6% used gloves on both hands.

Safe *use and disposal of sharps instruments* was defined as: not recapping needles and using adequate safe boxes for material disposal, following all steps described by CDC (1999). This was assessed in 36 encounters, out of which 86% (n =31) were appropriate.

Cleaning surfaces and any shared materials between clients should be done to reduce potential contamination from client to client and from client to health worker. HCWs sometimes used scissors or other materials that are reused for other clients. Shared materials were used in 28 encounters, but the material was observed to be disinfected or put aside for later cleaning only 42.9% of the time. The cleaning of surfaces was even more neglected. Surfaces such as exam tables were cleaned between clients care in only 18.2% of the situations observed. Additionally, when body fluids were visible, the surfaces were cleaned only 15.8% of the time before attending another client (3 out of 21 observations). As previously stated, *disinfectants* were available only about half of the time.

To evaluate the overall use of SP in each observation where there was potential contamination with body fluids, we counted the use of 10 elements of SP described above. The possible score ranged from 0 to 10. Seven HCW (13.5%) reached the maximum score

and 40.4% received a score of 6 or less. The mean was 6.9 (*SD* 1.96). Table 2 shows the distribution for all observations regarding the use of SP.

We then examined whether professional HCWs (doctors, nurses, midwives, and dentists) showed more consistent use of SP than the paraprofessionals. No significant difference was found on the use of SP between professionals (mean score: 7.48) and para-professionals (mean score: 6.61) (t =1.19; p>.05). We also examined whether gender made a difference, but no difference was found between the use of SP and the sex of the HCW (t =1.58; p>.05).

Because lack of resources can be a cause of failure to use SP, we examined the correlation between the overall SP score and the resource availability score. Availability of resources score was positively correlated with the SP score (r =.61; p<.05).

Discussion

This study identified barriers to SP for Chilean HCWs, including lack of materials, fear or knowledge deficits, and stigmatization. Overall, most materials were available. However, some materials, including liquid soap in appropriate dispensers, disposable towels, and standard containers for the disposal of sharp instruments, were not always available or were available but not at the site of use. Moreover, the positive correlation between the use of SP and availability of materials suggests that lack of materials played a role in inconsistent use of SP.

In these community clinics there was no significant difference between professionals and technicians in the use of SP. In several clinics, an interview with the nurse in charge of following SP occurred right after the observations were done. The nurse reported that HCWs underused or overused SP depending upon their personal perception of risk of the situation. SP were underused if the client was a pregnant woman and they were overused when the HCW performed an invasive procedure with a homosexual client or a person living with HIV/AIDS. In those cases they used double gloves. Additional data from the original study came from focus groups discussing HIV/AIDS prevention with some of these same HCWs. In the Discussion section, the HCWs said that HIV is highly stigmatized, leading them to categorize clients as highly likely to live with HIV/AIDS or not. They also perceived an inconsistent use of SP, associated with the categorization of the client. SP were overused when clients were known to be HIV positive or belonged to what they perceived as a high risk group.

The only previous study conducted in Chile found that HCWs failed to use SP consistently (Mendoza et al., 2001). Five years later, this analysis documents that HCWs still do not consistently use SP in their daily practice at the observed community clinics. Aspects of SP that were especially neglected included hand washing, cleaning of surfaces, and cleaning of shared materials. Nearly half the HCWs did not wash their hands, which is regarded as the most important component of SP (CDC, 2006). Failure to wash hands between clients and after glove use potentially jeopardizes the health of both HCWs and their clients through the spread of HIV and many other pathogens contained in bodily fluids.

These findings suggest that the failure to use SP might also be associated with HIV/AIDS-related stigma and discrimination. A study conducted in Chile (Carmona & Del Valle, 2000), also found that HCWs who treat patients living with HIV/AIDS suffered isolation from other HCWs and overused SP in their examination rooms. Lack of understanding of the principles of SP or stigmatizing attitudes can also be barriers. A complete training of health care professionals should include to a better understanding of the importance of SP.

Limitations of the study include the small number of observations and the possibility that HCWs behaved differently when observed. Because of the small sample, the degree of compliance is only approximate. However, even this small sample identified clear areas of concern. Being observed might be expected to put HCWs on their “best behavior,” so we would expect this to be an overestimate rather than an underestimate. However, it is clear from the results that even when they knew they were being observed HCWs did not practice SP consistently. This is the first study in Chile that has examined SP in outpatient services or reported on different levels of HCWs that have contact in different situations with clients. The only previous Chilean study (Mendoza et al., 2001) documenting inconsistent use of SP occurred among physicians, nurses, and nurse assistants in a pediatric unit of a hospital. Therefore, despite its limitations this study provides important new information relevant to health education, practice, and policy.

Conclusions

HCWs are key players in the prevention and management of HIV infection (Hentgen et al., 2002) and play a crucial role in the implementation of preventative programs to fight the steady increase in the prevalence of HIV infection and AIDS (Bluespruce et al., 2001; Ezedinachi et al., 2002). This study in outpatient clinics, combined with the previous in-hospital study (Mendoza et al., 2001), supports the need for increased training regarding SP for all HCWs in Chile. HCWs also need to be sensitized to the stigma and misinformation associated with HIV/AIDS, and how the stigma negatively affects the safety and sensitivity of client care. In Chile, HCWs are required to receive regular continuing education to maintain their career in community clinics. One cost-effective way to bring ongoing training in SP would be to make it a regular continuing education offering, and perhaps mandating that all HCWs receive additional SP education periodically. In addition, it is important to train non-clinical workers who have some contact with clients or with waste products and cleaning, such as receptionists and cleaners. A climate of prevention must be established in Chile to increase the consistent use of SP by HCWs (Bluespruce et al., 2001). This requires administrative support, strong initial training, and continuing reinforcement of training (continuing education) for HCWs, and regular encouragement and monitoring of SP compliance.

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TABLE 1

Measures of Standard Precautions (SP)

Measures	Operational measure
1. Availability of resources	Presence (yes/no) in the clinical area being observed of the supply of:
A. Hand washing	Liquid Soap, disposable towel, standard sharp container, and disinfectant.
B. Soap	
C. Towel	
D. Glove use	
E. Sharp containers	
F. Disinfectant for cleaning surfaces	Summary, presence of: liquid soap, disposable towel, standard sharp container, and disinfectant
G. Overall availability of resources	
2. SP behaviors	Each item coded yes/no/not applicable:
A. Hand washing	Wash hands:
	1. Before attending a client
	2. After having contact with a risky fluid
	3. Immediately after removing gloves
B. Glove use	Used gloves (coded yes/no/not applicable):
	4. When potentially in contact with blood or other risky body fluids
	5. New gloves for each client
	6. On both hands
C. Safe use and disposal of sharps instruments	7. Not recapping needles
	8. Using adequate safe boxes for material disposal
D. Cleaning surfaces and any shared materials	9. Cleaning surfaces between clients
	10. Cleaning scissors or any other shared material between clients
E. Overall SP score	Summary score from 0 to 10, indicating the numbers of times SP were appropriately used divided by the number of the 10 different situations described above

TABLE 2

Distribution of Frequencies and Percentages for Standard Precautions (SP) Score

SP score	Frequency (*n*)	Valid percentage (%)
3	3	5.8
4	2	3.8
5	7	13.5
6	9	17.3
7	12	23.1
8	6	11.5
9	6	11.5
10	7	13.5