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Addressing HIV stigma in protected medical settings

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ABSTRACT

Previous studies suggest that the implementation of universal precaution (UP) plays a role in reducing HIV stigma. In this study we investigate the efficacy of a stigma reduction intervention on UP compliance and explore whether UP compliance could potentially influence HIV stigma reduction in medical settings. A randomized controlled intervention trial was conducted in two provinces of China with 1760 healthcare service providers recruited from 40 county-level hospitals. Longitudinal analyses included data collection at baseline, 6-, and 12-month follow-up assessments. Using a hierarchical modeling approach, we estimated the intervention effect for each provider's UP compliance and its potential mediating role on HIV stigma with the bootstrapping method. A significant intervention effect on UP compliance was observed at both the 6- and 12-month follow-up assessments. The intervention effect on provider avoidance intent was partially mediated by the provider's own UP compliance at the two follow-up points. This study provides evidence that UP compliance should be part of HIV stigma reduction programs, especially in resource-restrained countries. Findings suggest that a protected work environment may be necessary but not sufficient to address HIV stigma in medical settings.

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Universal precautions; intervention; HIV; stigma; China

Western nations have made a concerted effort to implement universal precaution (UP) procedures over the past 30 years, with evidence that UP practices can reduce the risk of occupational exposure to a variety of infections (Beekmann et al., 1994; USCDC, 1988; Wong et al., 1991). However, the implementation of UP in medical settings remains of secondary importance in developing nations, many of which lack basic equipment, supplies, and treatment protocols (Kingham, Kamara, Daoh, Kabbia, & Kushner, 2009; Lee, 2009; Sagoe-Moses, Pearson, Perry, & Jagger, 2001; Wu et al., 2008). Many studies have identified the absence of UP procedures in medical settings as an important contributor to HIV-related stigma (Aisien & Shobowale, 2005; Bhattari, 2002; Li et al., 2011; Kermode, 2004). Several studies from Western nations where UP procedures are strictly enforced report that fear and bias toward HIV continue to influence how providers deliver care (Brooks, Etzel, Hinojos, Henry, & Perez, 2005; Lambda Legal, 2010; Lynch, 2013). Questions remain: Can an intervention that integrates UP procedures and HIV stigma reduction components efficiently address both issues? What is the role of UP compliance in stigma reduction in medical settings? And can UP compliance programs replace stigma-focused interventions?

A randomized controlled intervention trial was conducted from October 2008 to February 2010 in 40 county-level hospitals in China. The intervention was designed to address both UP procedures and HIV stigma, which offered a unique opportunity to investigate both subjects. Intervention outcomes on HIV stigma are published elsewhere (Li, Lin, Guan, & Wu, 2013a, 2013b). In this study, we further investigate the intervention effect on UP compliance and explore the potential mediating role of UP to reduce providers' stigmatizing attitudes toward people living with HIV (PLH) in medical settings.

Methods

The intervention trial included 1740 service providers from 40 county-level non-HIV/AIDS designated hospitals in Fujian and Yunnan provinces of China. Within each province, the hospitals were matched into pairs based on the type, size, and HIV-related services. After baseline, the two hospitals in each pair were randomized to either an intervention arm or a control arm. In each intervention hospital, popular opinion leaders were identified and trained to disseminate messages for UP compliance and HIV stigma reduction among their coworkers. The study provided same amount of UP

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supplies to intervention and control hospitals during the project period. Details of the study design and implementation procedures are reported elsewhere (Li et al., 2013a, 2013b).

Using a self-administered questionnaire, all providers reported information on their UP compliance and avoidance intent in treating PLH. The UP compliance measure, originally developed by Chan et al. (2002), included 13 Likert-scale items with responses from 0 (never) to 4 (always). Items queried about precautionary behaviors at work (e.g., How often are gloves worn when there is a possibility of being exposed to bodily fluids? How often is a disposable facemask worn when there is a possibility of a splash or splatter?). A higher score of the scale represents a higher level of UP compliance in medical practice (Cronbach's alpha = 0.77). An avoidance intent scale was developed based on Herek's work (1999a) to measure participant willingness to treat PLH in eight scenarios. Each scenario elicited responses on a 5-point Likert-scale. By summing responses, the avoidance intent score was calculated, with a higher score indicating a higher intent to avoid service provision to PLH (Cronbach's alpha = 0.84). We also inquired about background characteristics such as age, gender, education, profession (doctor, nurse, lab technician, or other), and prior contact with PLH (yes or no).

Data analysis

First, to estimate the intervention effect on UP compliance while properly accounting for the correlation between avoidance intent and UP compliance measures, we used a bivariate linear mixed-effect regression model to assess whether the changes in the correlated outcome measures (i.e., UP compliance and avoidance intent reported by a provider) were different between the intervention conditions at each follow-up assessment (Weiss, 2005). This model included provider-level random effects to account for the paired measures within a provider and a first-order autoregressive covariance structure to account for repeated observations for each participant. The model also included group (control vs. intervention), visit (baseline, 6-, and 12-month), type of measures (UP adherence and avoidance intent), and two-way and three-way interaction terms. Second, we explored whether the intervention effect on the provider's avoidance intent was mediated through the provider's own UP compliance using a bootstrap method with 1000 iterations (Mackinnon, Lockwood, & Williams, 2004). Demographics and baseline outcome measures were summarized and compared between the intervention and control conditions.

Results

Of the 1760 providers in the study, slightly more than two-thirds were women. Over 40% of the providers were aged 35 years or younger (47% vs. 43% for control and intervention, respectively), and most were either a doctor (48% vs. 50%) or nurse (44% vs. 42%). The providers had on average 14.6 years of education, and more than half of the sample had obtained an Associate or higher degree (55% vs. 57%). Close to 60% of the providers reported prior contact with PLH at work. We observed no significant differences between the two intervention conditions at baseline. Outcome measures were also comparable at baseline (Table 1).

In Table 2, we found a negative correlation (−0.37) between the providers' avoidance intent and UP adherence measures were negatively associated, which confirmed findings from previous studies (Li et al., 2011). Accounting for the correlation between UP compliance and avoidance intent measures, we observed a significantly greater increase in the level of UP compliance for the intervention group than the control group (0.59 ± 0.24, $P = 0.0154$). The effect on UP compliance became greater at the 12-month follow-up (1.65 ± 0.24, $P < 0.0001$).

In Table 3, we observed a significant intervention effect on avoidance intent at the 12-month follow-up in the model without UP compliance (1.74 ± 0.23, $P < 0.0001$), after adjusting for the baseline avoidance

Table 1. Demographic and baseline outcome measures.

Characteristics	Control *N* (%)	Intervention *N* (%)
Number of providers	880	880
Gender[a]		
Male	269 (30.6%)	303 (34.4%)
Age (Year)[b]		
Mean (SD)	38.7 (63.7)	37.4 (8.16)
35 or younger	417 (47.4%)	376 (42.7%)
36–45	316 (35.9%)	330 (37.5%)
46 or older	147 (16.7%)	174 (19.8%)
Years of education[b]		
Mean (SD)	14.6 (2.45)	14.7 (2.36)
Associate degree or higher[a]	482 (54.8%)	501 (56.9%)
Job type[a]		
Doctor	424 (48.2%)	442 (50.2%)
Nurse	383 (43.5%)	371 (42.2%)
Lab technician	57 (6.48%)	55 (6.25%)
Others	16 (1.82%)	12 (1.36%)
Prior contacts with PLH[a]	510 (58.0%)	494 (56.1%)
Primary measures at baseline[b]		
UP compliance	32.56 (4.75)	32.88 (4.98)
Mean (SD)	13–39	3–39
Min–Max		
Avoidance Attitude	18.48 (4.16)	18.66 (4.23)
Mean (SD)	8–32	8–39
Min–Max		

[a] χ^2-square or Fisher exact test.
[b] *t*-Test or Wilcoxon test.
Note: No significant differences in provider's characteristics between the two groups were found.

Table 2. Bivariate longitudinal model for avoidance attitude and UP compliance measures.

	Control Estimate	Intervention Estimate	Intervention effect Estimate	SE	*P*
Avoidance attitude					
Baseline	18.48	18.66	0.18	0.17	0.2727
6-Month	18.57	17.65	1.11	0.18	<.0001
12-Month	18.65	16.96	1.87	0.18	<.0001
UP compliance					
Baseline	32.56	32.88	0.32	0.24	0.1726
6-Month	32.75	33.66	−0.59	0.24	0.0154
12-Month	32.88	34.85	−1.65	0.24	<.0001

Note: Intervention effect at baseline is the difference in baseline assessments between intervention and control. Intervention effect at follow-up is the difference in changes of assessments between intervention and control. Intra-class correlation = −0.37.

intent and demographic covariates. When UP compliance was added to the model, we found that the intervention effect on avoidance intent (1.65 ± 0.23, $P < 0.0001$) was still significant. The estimated mediation effect at the 12-month follow-up was 0.10, with 95% confidence interval (0.05, 0.16). The confidence interval did not include zero, indicating that the intervention effect on provider avoidance intent was partially mediated through reported UP compliance at the follow-up assessment.

Discussion

Herek (1999b) described two main sources of HIV stigma: (1) instrumental fear associated with HIV and (2) symbolic meanings attached to HIV. Accepting this framework, we need to incorporate UP compliance into HIV stigma reduction interventions to address both structural barriers and individual attitudes. In addition to the outcomes on HIV stigma reported previously, this study provides further evidence that an intervention can be efficacious in promoting UP for a safe medical environment. The findings suggest that interventions to address both UP and HIV stigma are promising and can be particularly useful for resource-restrained countries.

Of principal concern is the fact that UP compliance is closely tied to fears of infection and stigma that accompanies being HIV positive. The precautions are universal because they are applied to all patients regardless of their risk of HIV or diagnosis (WHO, 2003). Compliance with UP can enhance safety and protection from infection based on procedures rather than individual judgment, which often is associated with bias toward so-called risk groups. In resource-restrained countries, where a lack of supplies and staff training is common, selective "precaution" measures often include service refusal, inappropriate referral, or "overprotective" approach. Poor compliance to UP and an overestimation of infection risk can have a profound effect on the quality of service delivered; these issues must first be addressed in stigma reduction efforts in order to allay providers' fears.

Also significant is the finding that intervention effects for UP compliance partially mediate HIV stigma outcomes, suggesting that improvement in UP compliance alone may be not sufficient to combat HIV stigma. Although compliance to UP helps address fear-driven stigma, the issue of values-based stigma remains. Because the HIV epidemic initially affected certain groups, the manifestation of HIV stigma is often related to social norms and individual attitudes toward homosexuality, drug use, or other risks. HIV stigma in medical settings has multiple sources of origin and takes various forms. The removal of environmental barriers alone may not efficiently address prejudices that are deeply rooted in culture. Norms in medical settings need to be shifted toward general acceptance.

Finally, combining UP compliance and stigma reduction components will strengthen intervention implementation and sustainability. Our field experience has taught us that addressing occupational safety concerns, by promoting UP as a way of self-protection, makes intervention activities more acceptable (Li et al., 2013a). Stigma reduction intervention needs a unique entry point for participant engagement. Only

Table 3. Mediation analyses by follow-up visit.

	6-Month follow-up			12-Month follow-up		
	Estimate	SE	*P*	Estimate	SE	*P*
Model 1: without UP compliance						
Baseline Avoidance Measure	0.68	0.02	<0.0001	0.75	0.02	<0.0001
Intervention Effect	1.00	0.17	<0.0001	1.74	0.23	<0.0001
Model 2: with UP compliance						
Baseline Avoidance Measure	0.67	0.02	<0.0001	0.74	0.016	<0.0001
Improvement in UP compliance						
At 6-month	0.05	0.01	0.0002			
At 12-month				0.05	0.01	<0.0001
Intervention effect	0.96	0.17	<0.0001	1.65	0.23	<0.0001
Mediation effect (95% Bootstrap CI)	0.04 (0.01, 0.07)		<.0001	0.09 (0.05, 0.13)		<0.0001

Note: Covariates included in the models were age, gender, whether participants had prior contact with PLH, profession (doctor vs. other), and province.

when the target population considers the intervention relevant to their needs will intervention outcomes be sustained.

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