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Reducing HIV stigma among healthcare providers in India using a partly tablet-administered intervention: The DriSti trial

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Abstract

HIV stigma has long been recognized as a significant barrier in the worldwide fight against HIV & AIDS. Across cultures, including in India, stigma has been shown to cause psychological distress and act as a barrier to engagement in care. Health professionals can serve as a crucial source of HIV stigma, with stigma drivers that include fears and misconceptions regarding transmission during casual social contact and pre-existing negative attitudes towards marginalized groups vulnerable to HIV. In order to increase their impact, stigma reduction interventions need to be scalable and sustainable as well as adaptable to different contexts. The DriSti intervention was designed to meet these needs through an easily adaptable, mostly tablet-administered, interactive intervention that was delivered to ward staff (n=1,557) and nursing students (n=1,625) in 62 Indian institutions, using a cRCT design, comparing intervention participants to wait-list controls. Outcome analyses conducted at 6-month follow-up, showed significant reductions in misconceptions (p<.001, both groups) and worry about acquiring HIV in the work setting (p<.001, both groups). Intervention group participants also reported significantly greater reductions in their endorsement of coercive policies (p<.001, both groups) and in the number of professional situations in which they intended to discriminate against PLWH (p<.001, both groups) than did control participants. This brief intervention could easily be scaled up and adapted for similar populations in the region, using a variety of different mHealth platforms and has important implications for current global stigma reduction initiatives and training curricula.

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Keywords

HIV stigma; mHealth; stigma intervention; healthcare providers; nursing students; ward staff; India

Introduction

HIV stigma has long been recognized as a significant barrier in the worldwide fight against HIV & AIDS (Mann, 1987; Piot, 2006). Across cultures, stigma has been shown to cause psychological distress and act as a barrier to testing, disclosure, treatment-seeking, and adherence. A meta-analysis of global studies found that people who had experienced HIV stigma were at greater risk of depression, less social support, and less likely to access/use health and social services (Rueda et al., 2016). A global literature review of stigma and adherence (Katz et al., 2013) also showed that stigma compromised optimal ART adherence and a subsequent meta-analysis of studies from Low and Middle Income Countries (LMIC), demonstrated an association between stigma and late presentation to healthcare (Gesesew et al., 2017). Finally, Turan et al., (2019) showed that members of marginalized groups often experience "intersectional" stigma, which can compound and increase these negative outcomes.

Multiple studies in India have shown associations between HIV stigma and adverse health outcomes. It has been linked to both delayed HIV testing and treatment (Steward, Bharat, Ramakrishna, Heylen, & Ekstrand, 2013) and shown to impede timely care-seeking, treatment, and prevention (Achappa et al., 2013; Bharat and Chakrapani, 2014; Chakrapani, Velayudham, Shunmugam, Newman, & Dubrow, 2014; Chandra, Deepthivarma, & Manjula, 2003; Ekstrand, Bharat, & Srinivasan, 2018; Ekstrand, Heylen, Mehta, Sanjeeva, & Shet, 2018; Steward et al., 2011; Steward et al., 2008; Vallabhaneni, Chandy, Heylen, & Ekstrand, 2012). While the prevalence and types of disclosures examined vary between these studies, the main reasons for non-disclosure were shame and fear of discrimination and isolation. Within the healthcare setting, people living with HIV (PLWH) in India have reported provider discrimination, purposeful delay or denial of treatment, and breach of confidentiality following their diagnosis.

Healthcare facilities have been identified as a major setting for HIV stigma, both in India and elsewhere and health professionals can serve as a crucial source of HIV stigma (Arrey, Bilsen, Lacor, & Deschepper, 2017; Davtyan, Olshansky, Brown, & Lakon, 2017; Feyissa, Lockwood, Woldie, & Munn, 2018; Holzemer et al., 2009; Kay et al., 2018; Mill et al., 2013; Nyblade et al., 2019). Common stigma drivers include fears and misconceptions regarding transmission during casual social contact ("*instrumental stigma*") and pre-existing negative attitudes towards marginalized groups vulnerable to HIV ("*symbolic stigma*"). While our previous research sought to identify specific stigma-related attitudes and behaviors, it is now crucial to target their drivers in rigorously designed, theoretically-based interventions. The DriSti study (DRIve against STIgma) was designed to meet this need.

Methods

The study methods have been described in detail elsewhere (Nyblade, et al., 2018; Radhakrishna, et al., 2017).

Procedures:

Setting and participants—The analyses in this paper are from a cluster randomized controlled trial of an HIV stigma reduction intervention for nursing students (NS) and ward staff (WS) in Karnataka state, India. Between September 2014 and March 2018, we enrolled 1,625 NS from 28 nursing colleges and 1,557 WS from 34 hospitals (figure 1). We included institutions that serve a wide range of patients including private, non-profit, and government-run nursing schools and hospitals in Bangalore, Mysore, and Mangalore.

We randomly assigned 15 nursing colleges and 17 hospitals to the intervention, and 13 nursing colleges and 17 hospitals to the wait-list control, resulting in the enrollment of 737 NS and 788 WS in the intervention and 888 NS and 767 WS in the control. At six-month follow-up, 1519 NS (93%) and 1340 WS (86%) completed the assessment. Fifteen NS and 80 WS discontinued the study before six-month follow-up primarily due to leaving nursing school/work. Ninety-one NS and 137 WS were lost to follow-up at six months due to being out of contact, being on leave during the assessment window, or scheduling conflicts due to exams/rotations (NS). Attrition was higher among WS than NS (217 vs 106), primarily due to WS leaving their jobs for other hospitals. There were no statistically significant differences between attrition in the intervention arm and control arm for either NS (59 vs. 47) or WS (96 vs 121)

Eligible participants were 18 years of age or older and willing to participate in all sessions. We recruited second-year NS because they have started their clinical rotations, been trained in standard precautions, and experienced patient contact. WS had to have been employed for at least one year. They provide assistant care in hospitals, performing tasks such as transporting patients and samples, changing bed sheets, and attending to patients' hygiene.

Recruitment—We obtained permission from the heads of collaborating institutions and distributed announcements containing study information to potential participants during nursing student class hours and WS daily meetings. Interested potential participants attended a study information session in groups of 10–15 people. Afterwards, study staff scheduled an in-person private visit with anyone interested to screen for eligibility. If eligible, the interviewers explained the informed consent form in Kannada or English and answered questions. If interested, participants signed the consent form, which was co-signed and witnessed by a person not affiliated with the study. Once enrolled, we scheduled the baseline interview within a week.

Questionnaire procedures—Trained study interviewers were blinded to intervention assignment and administered the questionnaires using tablet computers at baseline, post-intervention (one month), six months, and 12 months. Each interview was in English or Kannada, lasted approximately 40 minutes, and was administered in a private space at the school/work site at a time that did not conflict with their school/work obligations.

Participants received a $3 reimbursement for their time. The present paper describes the outcome data collected at the 6-month visit. Twelve-month data management is underway.

Intervention Content and Procedure—Guided by Social Cognitive Theory and our India-specific conceptual model of HIV stigma, the intervention targeted the stigma drivers identified in our previous research (Ekstrand, Ramakrishna, Bharat, & Heylen, 2013). The specific activities were selected from two participatory stigma-reduction toolkits, one global, one India-specific (ICRW and UNDP, 2013; Kidd et al., 2003) and adapted for delivery via computer tablet. The final intervention package consisted of two self-guided sessions administered on computer tablets as well as one in-person, skills-based group session co-led by study staff and a PLWH from the local network (Table 1). The choice to deliver the intervention in this blended format was a compromise, based on the need to accommodate healthcare workers' busy schedules, while still including in-person skills-building activities and the opportunity to interact with a PLWH. Requiring all sessions to be group-based would have decreased the likelihood of future scale-ups.

Each tablet session included four modules combining video commentary by a narrator, interactive exercises, reflection on content, and summaries of the key points. A study team member was available to explain the process, administer the tablet sessions and answer questions. Participants could choose to complete the session in English or Kannada. Session one focused on defining stigma, building awareness of stigma in the hospital setting, and creating an understanding of stigmatizing attitudes. Session two aimed to reduce instrumental stigma by improving HIV transmission knowledge, addressing transmission fears, and discussing how to use standard precautions with all patients to reduce transmission risks.

The in-person group session included approximately 15 participants and was co-facilitated by intervention staff and a PLWH who shared their experiences with their HIV diagnosis and positive and negative encounters with the healthcare system. The session included a review of key lessons learned, a question-and-answer period with the PLWH, and role-playing exercises on hospital-based stigma with feedback, discussion and participant stigma reduction commitments.

Participants placed in the wait-list control group were offered the intervention following the completion of the 12-month assessment. Detailed descriptions of the intervention development and tablet content can be found elsewhere (Nyblade, et al., 2018; Radhakrishna, et al., 2017).

Ethics approval

Study procedures were approved by the Institutional Review Boards of the University of California, San Francisco and St. John's Medical College and Hospital. Clearances were obtained from the Indian Health Ministry Screening Committee and the US State Department.

Measures

The survey measures in this study were based on our previous work of stigma among Indian PLWH (Steward, et al., 2013; Steward, et al., 2011; Steward, et al., 2008) and healthcare workers in India (Ekstrand, et al., 2013).

Demographic information—Participants were asked about their gender, age, marital status, education, household income and religion.

Potential drivers of stigma

Contact with PLWH: Participants indicated the number of PLWH they had cared for as patients. This number was dichotomized as "any" vs. "0" HIV-positive patients.

Instrumental stigma: Participants reported how worried they were (1 "not at all" to 4 "very worried") about acquiring HIV, performing tasks with low (e.g. transporting a patient) vs. high (e.g. dress a wound) risk of fluid exposure. Items were tailored to NS (5 low-risk, 4 high-risk tasks) and WS (4 low-risk, 3 high-risk tasks). Scores were averaged into low-risk and high-risk scales. Cronbach's alpha = 0.76 for both low and high-risk among NS and 0.89 (low-risk) and 0.84 (high-risk) for WS.

Blame: Four items measured the extent to which participants agreed that people who acquired HIV through sex, drugs, a blood transfusion, or their spouse "got what they deserved." The items were measured on a scale from 1 ("strongly disagree") to 4 ("strongly agree"), with higher numbers indicating more blame, and were averaged. Cronbach's alpha = 0.60 and 0.65 among NS and WS, respectively.

Symbolic stigma: Three items measured participants' level of acceptance, level of comfort caring for, and level of comfort having as a neighbor for each of the following key populations: female sex workers, transgender people, men who have sex with men, and people who inject drugs. Items were measured on a 5-point scale with a higher score indicating less acceptance/greater discomfort, and responses averaged over all 12 items. Cronbach's alpha = 0.85 and 0.83 among NS and WS, respectively.

Transmission misconceptions: Seven items described casual social contact through which HIV cannot be transmitted (e.g. shaking hands). For each item, participants indicated whether they thought HIV could be transmitted this way. The number of incorrect responses was summed and transformed to a 0–100 scale to represent percent misconceptions.

Transmission knowledge: Participants were asked if they thought HIV could be transmitted by exposure to several kinds of bodily fluids (e.g. breastmilk, sweat), or by behaviors such as unprotected sex with PLWH. The number of correct answers to 11 such items was calculated and transformed to a 0–100 scale to represent percent correctly answered.

Stigma manifestations

<u>Intent to discriminate against PLWH.:</u> Intent to discriminate in professional situations was assessed by presenting participants the same set of tasks used for instrumental stigma and asking how they would perform each task with a PLWH. Response options were dichotomized as stigmatizing (refuse, get someone else to do it, or perform the task only with unnecessary precautions) versus non-stigmatizing (perform the task as they would with any other patient). Stigmatizing responses were summed into two separate indices, intention to discriminate against PLWH in low-risk situations (0–5 for NS and 0–4 for WS) and intention to discriminate against PLWH in high-risk situations (0–4 for NS and 0–3 for WS, respectively).

<u>Endorsement of coercive policies:</u> Participants indicated their agreement (1 "strongly disagree" to 4 "strongly agree") with 17 policies related to patient rights (e.g. having the right to refuse treating PLWH); the right to choose to disclose HIV status, or for PLWH to marry and have children; and mandatory HIV testing. Items were dichotomized, and stigmatizing responses (strongly/somewhat agree) were summed into an index (range 0–17).

Data Analyses:

Descriptive analyses consisted of frequencies for categorical variables and means plus standard deviations (SD) for count and continuous variables. T-tests were used to determine if mean levels of potential drivers and manifestations of stigma differed between the intervention and control arm at baseline and six-month follow-up. The effect of the intervention was assessed via change scores, i.e. the difference between pre- and post-intervention (six-month follow-up) scores. T-tests (corrected for heterogeneity of variances between the two-groups) assessed if the mean change scores differed significantly between intervention and control group participants.

All analyses were performed separately for NS and WS.

Results

As seen in Table 2, the NS were predominantly female (94.9%), single (99.4%), young (median age: 20), and Christian (52.2%) or Hindu (41.1%). Among the WS, 72.7% were female, 69.0% married, and 81.6% Hindu. Most WS reported 5–10 years of education, and their median age was 39.

Stigma drivers

Virtually all participants (89.4%, n=1358 of NS and 98.2%, n=1316 of WS) reported some experience caring for patients with HIV. Knowledge of correct HIV transmission was high at baseline: NS obtained a correct score on 86.5% of the knowledge items, while WS obtained a mean of 82.8% correct (see Tables 3 and 4, respectively). However, about two-thirds in each sample (n=972 and 894 for NS and WS, respectively) also held at least one misconception about transmission via casual contact, and the majority of both NS and WS were worried about acquiring HIV in work situations with both low (84.2%, n=1279 and 52.2%, n=700, respectively) and high-risk of fluid exposure (97.0%, n=1473 and 62.8%,

n=841, respectively). Seventy percent of NS (n=1065) also worried about acquiring HIV outside of work, compared to 26.2% (n=989) of WS.

Negative attitudes toward key populations were prevalent, with a mean symbolic stigma score of 3.45 on a 1–5 scale for NS and 2.95 for WS. Similarly, mean levels of blame, i.e. agreement that PLWH 'got what they deserved' were 2.20 and 2.52 on a 1–4 scale, for NS and WS, respectively.

A comparison between the intervention and control group showed that there were small but statistically significant differences between the NS in the intervention and control group at baseline for misconceptions, symbolic stigma, and instrumental stigma in low-risk professional situations (see Table 3). There were no baseline differences between the two intervention groups for WS.

Baseline levels for the outcomes are also presented in Tables 3 (NS) and 4 (WS), showing that NS endorsed a mean of 8.82 out of 17 coercive measures and intended to discriminate against PLWH in, on average, 3.12 out of 5 professional situations with low-risk of fluid exposure and 3.62 out of 4 professional situations involving high-risk. WS endorsed an average of 10.02/17 coercive measures, and reported intent to discriminate for 2.96/4 low-risk and 2.57/3 high-risk professional situations.

Post-intervention means from the six-month follow-up for both intervention groups are presented in the middle columns of Tables 3 (NS) and 4 (WS). Analyses of the changes from baseline to six-month follow-up showed that intervention group NS had a greater mean increase in knowledge (+2.99 vs +1.31, p<.05) and larger decrease of misconceptions about HIV transmission risk (−6.22 vs. −0.27, p<.001) than control group NS. They also became significantly less worried about acquiring HIV on all 3 instrumental stigma variables (see Table 3 for details). The intervention also had an impact on all the outcome measures among the NS: intervention group participants reduced their endorsement of coercive measures significantly more than control participants (−0.50 vs.+0.23, p<.001) and reported significantly greater reductions in the mean number of professional situations (low-risk: −0.81 vs +0.38; high-risk −0.54 vs. +0.12; both p<.001) in which they intended to discriminate against PLWH than did control arm participants.

Among WS, the intervention led to a significantly greater mean reduction of transmission misconceptions (−6.83 vs. +1.46, p<.001) and instrumental stigma in both types of professional situations (low-risk: −0.06 vs. +0.12; high-risk: −0.10 vs. +0.11, both p <.001) among intervention than control group participants. WS in the intervention arm also showed a significantly larger decrease in endorsement of coercive measures (−0.53 vs. +0.05, p<.001) and intent to discriminate against HIV+ patients at work (low-risk: −0.14 vs +0.16; high-risk −0.17 vs. +0.03; both p<.001) compared to WS in the control arm (Table 4).

Discussion

This brief, mostly tablet-administered stigma reduction intervention, targeting established stigma drivers and involving PLWH, significantly reduced both endorsement of coercive policies toward PLWH and intent to discriminate among nursing students and ward staff.

The intervention was designed to be responsive to calls in previous reviews of the stigma reduction intervention literature for interventions that are scalable (e.g. Stangl, Lloyd, Brady, Holland, & Baral, 2013). The authors noted that critical challenges and gaps remained and that these had hindered the identification of effective stigma-reduction strategies that can be scaled up. The decision to deliver most of the intervention on a computer tablet also followed informal feedback by hospital administrators that multi-session group interventions were not feasible in their institutions. By using a partly tablet-administered intervention adaptable to different contexts, the DriSti intervention can help meet these needs.

In addition to reducing endorsement of coercive measures and intent to discriminate, the intervention impacted multiple key drivers of stigma and discrimination in Indian healthcare settings (e.g. Ekstrand, et al., 2013) including transmission misconceptions and worry about acquiring HIV at work. Since no significant reduction was seen in blame or negative attitudes toward key populations, future research is needed to identify more effective strategies to impact these stigma drivers.

Limitations of this study include the use self-report, which may underestimate the prevalence of stigma attitudes. However, the high rates of reported stigma suggest that most participants felt comfortable admitting to having stigmatizing attitudes. Due to resource constraints, we were unable to collect data from patients to examine if they perceived any reductions in stigma attitudes/behaviors among staff following the intervention. Future research is needed to examine this possibility.

Despite these limitations, the importance of these findings is underscored by several global initiatives to reduce stigma, including The Global Partnership for Action to Eliminate All Forms of HIV related Stigma and Discrimination (UNAIDS, 2018) as well as current efforts by the Thai government to implement a stigma reduction intervention in healthcare settings via e-learning (South to South learning and exchange meeting, 2016) and the UN initiative focused on health facilities (UNAIDS, 2017). The tools developed for the DriSti android app could be adapted for different geographical regions and support these global initiatives.

As noted by the Thai government during the 2016 White House meeting on stigma (Office of National AIDS Policy, 2016), there is a need for effective e-learning stigma reduction interventions that can be scaled up and administered in healthcare settings. This intervention could meet that need by using a variety of mHealth platforms, including smartphones, given their increased use in many global settings.

The results also show the feasibility of training all levels of staff, including aides with minimal literacy skills, whose jobs may be limited to transporting patients or cleaning beds. Such staff are rarely offered training opportunities even though their patient interactions can impact care outcomes. Future research is needed to examine whether the intervention is equally effective in other groups of healthcare professionals, medical students, and allied health students. Given the high prevalence of stigmatizing attitudes among NS at baseline, the findings suggest that it would be useful to incorporate stigma reduction modules into their curricula.

In summary, this brief, mostly tablet-delivered stigma reduction intervention has important implications for both programs and future research as part of our ongoing efforts to improve health outcomes for people living with HIV.

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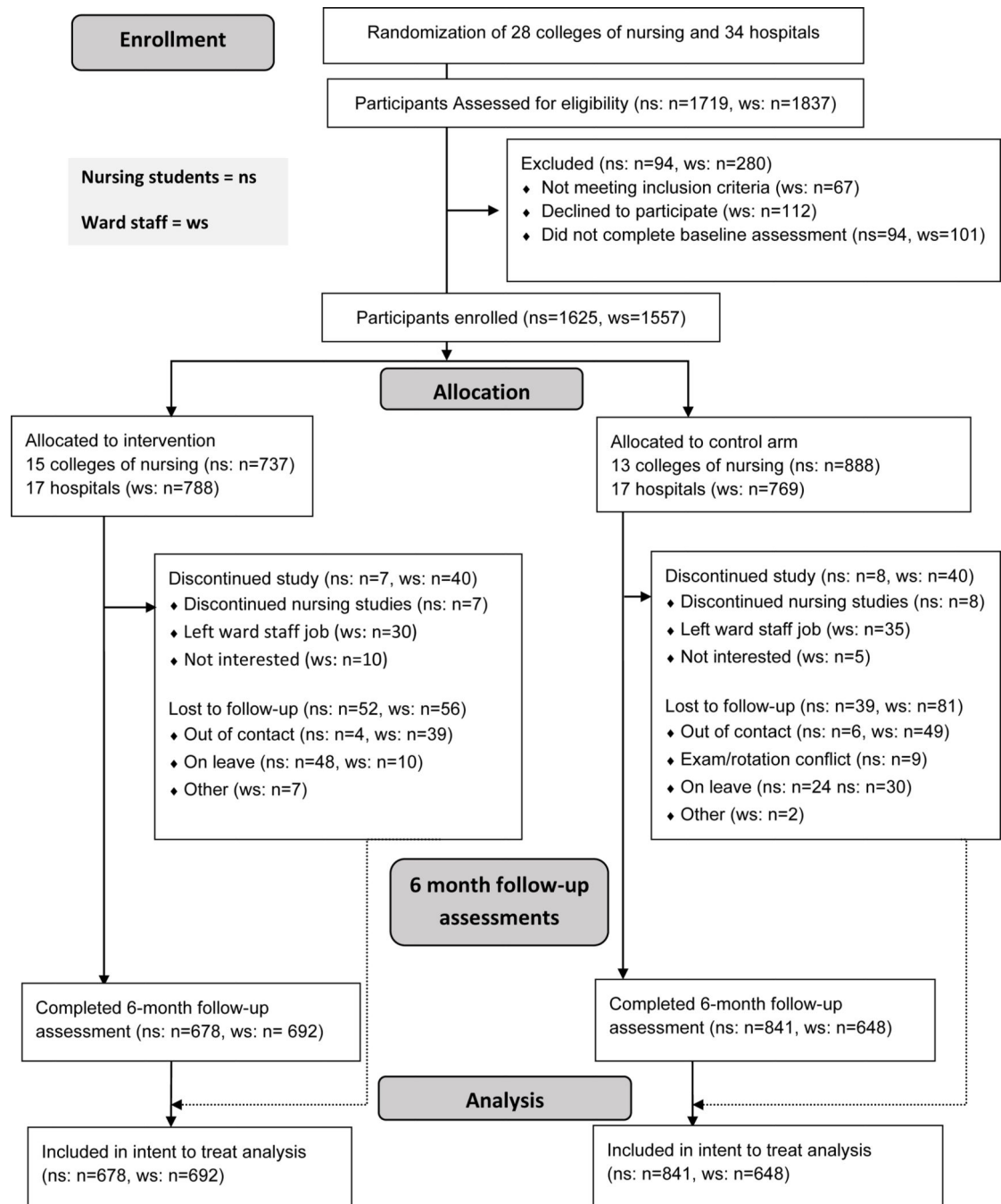
Figure 1:
Dristi CONSORT flow diagram

Table 1:

Intervention content

Tablet session 1 (four modules, self-administered, 50–70 min)
Module 1 - Defining stigma
• Media: Introductory video of stigma in the household setting showing examples of stigmatizing actions and consequences of stigma for PLWH
• Exercise: Participants reflect on video and record their own definition of stigma, selecting images of groups that may be stigmatized. Participants reflect on their experience with stigma and stigmatizing attitudes they may hold.
Module 2 - Virtual Walkthrough
• Media: Interactive virtual walkthrough of a hospital, similar to Google Streetview, includes virtual map with 360° view of two inpatient and 12 out-patient locations.
• Exercise: Participants select different locations in the hospital and view brief videos of stigmatizing and non-stigmatizing interactions in each setting. Participants answer multiple choice questions on how they would feel in this situation.
Module 3 - Beliefs and Attitudes
• Exercise: Survey on beliefs and attitudes about PLWH and marginalized groups.
• Media: Video describes concepts of stereotyping, judgement and empathy.
Module 4 - Testimonials
• Media: Three video testimonials by PLWH on stigma
• Exercise: Participants reflect on how they would feel and react in each situation.
Tablet session 2 (four modules, self-administered 30–45 min)
Module 5 - Review of tablet session one
• Media: Video reviews learning points of session 1 and revisits hospital walkthrough.
• Exercises: Participants identify locations they visited in session 1, in which they were most surprised to find stigma.
Module 6 - Transmission misconceptions
• Exercise: Participants review statements on different ways HIV can be transmitted and indicates if they ever had a co-worker tell them it is a mode of transmission.
• Media: Video provides an explanation on why each statement is correct on incorrect.
Module 7 - Transmission fears and behaviors
• Media: Four images of patient procedures (tailored to responsibilities of nurses or ward staff). Each image is associated with a video explaining why the procedure is low risk or how to use standard precaution to protect against risks.
• Exercise: Participants select the amount of fear they experience when performing the procedures on PLWH
Module 8 - Standard precaution
• Media: Four videos on using standard precaution with scenarios depicting mistakes that may increase transmission risks of infectious disease or how using extra precautions may be stigmatizing. The second scenario demonstrates corrective practices that can be applied in the previous scenario.
Group session (co-facilitated by intervention staff and PLWH, 90 minutes)
• Participants share experiences and summarize key points of tablet sessions
• PLWH co-facilitator describes their experiences living with HIV and recounts a stigmatizing situation in a healthcare setting, followed by a positive experience.
• Exercise: Group splits into smaller groups for role playing exercises on stigma in healthcare settings followed by feedback and discussion. Participants make individual commitments to reduce stigma in health care facilities.

Table 2.

Sample characteristics at baseline

	Nursing Students (n=1519)	Ward Staff (n=1340)
Female gender	94.9 % (1441)	72.7 % (974)
Religion		
Hindu	41.1 % (624)	81.6 % (1093)
Christian	52.2 % (793)	14.9 % (200)
Other	6.7 % (102)	3.5% (47)
Married	0.6 % (9)	69.0% (924)
Education		
4 yrs		21.9 % (293)
5–10 yrs		66.2 % (887)
>10 yrs		11.9 % (160)
Monthly household income (INR)[a]		
10,000	33.5 % (509)	39.9 % (534)
10,001 – 20,000	37.3 % (567)	47.5 % (637)
>20,000	28.8 % (438)	12.6 % (169)
Age: median (range)	20 (18 – 39)	39 (18 – 60)

[a] missing data for 3 nursing students

Table 3.

Baseline and six-month levels of knowledge, stigma and discrimination among nursing student cohort members, intervention (n=678) vs. control group (n=841): Mean (SD)

	Baseline			6 months		Difference score (6mo – BL)	
	All	**Interv.**	**Control**	**Interv.**	**Control**	**Interv.**	**Control**
Drivers:							
Transmission knowledge: % correct	86.5 (12.2)	86.1 (12.5)	86.8 (11.9)	89.1 (11.6)	88.2[†] (11.4)	+2.99 (14.0)	+1.31[*] (14.8)
Misconceptions casual contact: % misconceived	21.0 (22.0)	19.5 (21.5)	22.1[*] (22.3)	13.3 (18.6)	21.9[***] (23.4)	−6.22 (22.9)	−0.27[***] (23.2)
Blame (1–4)	2.20 (0.69)	2.19 (0.72)	2.21 (0.68)	2.03 (0.74)	2.10[†] (0.65)	−0.15 (0.74)	−0.11 (0.70)
Symbolic stigma (1–5)	3.45 (0.81)	3.37 (0.80)	3.52[***] (0.82)	3.17 (0.93)	3.39[***] (0.87)	−0.19 (0.86)	−0.13 (0.71)
Instrumental stigma (1–4)							
Outside of work	2.15 (0.99)	2.19 (1.04)	2.12 (0.95)	1.92 (0.93)	2.03[*] (0.85)	−0.27 (1.18)	−0.09[**] (1.09)
Low risk prof situations	1.69 (0.61)	1.75 (0.64)	1.63[***] (0.57)	1.55 (0.61)	1.64[**] (0.55)	−0.20 (0.58)	+0.01[***] (0.53)
High risk prof situations	2.53 (0.74)	2.51 (0.76)	2.54 (0.73)	2.25 (0.80)	2.42[***] (0.69)	−0.26 (0.80)	−0.12[***] (0.68)
Outcomes:							
Endorsement of Coercive measures index (0–17)	8.82 (2.37)	8.77 (2.40)	8.87 (2.35)	8.26 (2.43)	9.09[***] (2.31)	−0.50 (2.73)	+0.23[***] (2.55)
Intent to discriminate in professional situations, index							
Low risk situations (0–5)	3.12 (1.64)	3.06 (1.59)	3.17 (1.67)	2.25 (1.83)	3.55[***] (1.54)	−0.81 (1.90)	+0.38[***] (1.55)
High risk situations (0–4)	3.62 (0.75)	3.53 (0.82)	3.70[***] (0.67)	3.00 (1.40)	3.82[***] (0.51)	−0.54 (1.51)	+0.12[***] (0.74)

[***] p<.001

[**] p<.01

[*] p<.05

[†] p<.10

Table 4.

Stigma, discrimination and drivers among among ward staff cohort members at baseline and 6-month follow-up, intervention (n=692) vs. control group (n=648): Mean (SD)

	Baseline			6 months		Difference score (6mo – BL)	
	All	**Interv.**	**Control**	**Interv.**	**Control**	**Interv.**	**Control**
Drivers:							
Transmission knowledge (0–100)	82.80 (15.89)	82.3 (16.1)	83.4 (15.7)	83.6 (16.8)	82.9 (16.0)	+1.31 (20.1)	−0.49 [†] (19.5)
Misconceptions casual contact (0–100)	27.04 (28.66)	26.1 (27.7)	28.0 (29.6)	19.3 (23.8)	29.5 [***] (30.3)	−6.83 (25.3)	+1.46 [***] (29.0)
Blame (1–4)	2.52 (0.89)	2.56 (0.87)	2.47 [†] (0.90)	2.38 (0.87)	2.36 (0.89)	−0.18 (0.96)	−0.11 (0.99)
Symbolic stigma (1–5)	2.95 (0.88)	2.96 (0.88)	2.95 (0.87)	2.93 (0.94)	2.91 (0.90)	−0.02 (0.93)	−0.04 (0.88)
Instrumental stigma (1–4)							
Outside of work	1.43 (0.86)	1.45 (0.88)	1.42 (0.84)	1.45 (0.81)	1.41 (0.81)	0.00 (0.97)	−0.01 (1.03)
Low risk prof situations	1.73 (0.90)	1.77 (0.92)	1.69 [†] (0.88)	1.71 (0.89)	1.80 [†] (0.97)	−0.06 (0.90)	+0.12 [***] (0.94)
High risk prof situations	2.00 (1.00)	2.04 (1.02)	1.96 (0.98)	1.94 (0.96)	2.07 [*] (1.03)	−0.10 (1.01)	+0.11 [***] (1.01)
Outcomes:							
Endorsement of Coercive measures index (0–17)	10.02 (2.40)	10.07 (2.56)	9.97 (2.21)	9.54 (2.41)	10.02 [***] (2.44)	−0.53 (2.86)	+0.05 [***] (2.71)
Intent to discriminate in professional situations, index							
Low risk situations (0–4)	2.96 (1.41)	2.87 (1.43)	3.05 [*] (1.38)	2.73 (1.53)	3.21 [***] (1.33)	−0.14 (1.74)	+0.16 [***] (1.41)
High risk situations (0–3)	2.57 (0.88)	2.52 (0.91)	2.62 [*] (0.83)	2.35 (1.05)	2.65 [***] (0.83)	−0.17 (1.21)	+0.03 [***] (0.93)

[***] p<.001

[**] p<.01

[*] p<.05

[†] p<.10