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Caring for caregivers: An HIV/AIDS workplace intervention for hospital staff in Zambia—Evaluation results

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Caring for Caregivers: An HIV/AIDS Workplace Intervention for Hospital Staff in Zambia

Evaluation Results

Horizons Program

PATH

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University of Zambia Institute of Economic and Social Research

Zambia Medical Association

Zambia Health Education and Communication Trust

Caring for Caregivers:
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Evaluation Results

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The principle investigators for this study were Karusa Kiragu (Horizons/PATH, Nairobi), Thabale J. Ngulube (University of Zambia Institute of Social and Economic Research – INESOR), Mutinta Nyumbu (SHARe/JSI JSI Research & Training Institute, Inc.), and Panganani Njobvu (Zambia Medical Association). The intervention was designed and supervised by Panganani Njobvu, with Chilufya Mwaba of the Zambia Health Education and Communication Trust (ZHECT). The study was monitored by Arthur Kalimbwe, formerly with the Zambia Medical Association. Mbiko Msoni (INESOR), William Muhwava (SHARe/JSI, Chazanga Tembo (SHARe/JSI), and Scott Geibel (Horizons/Population Council, Nairobi) assisted with data entry and management. Alison Lee (consultant) copy-edited the report, and Sherry Hutchinson (Horizons/Population Council, Washington DC) oversaw the layout. Appreciation is extended to Caroline Mackenzie, Dianah Mwangi and George Odingo (Horizons/Population Council, Nairobi), for assistance with various aspects of this project. Thanks also go to Scott Kellerman (Horizons/Population Council, New York) and Ellen Weiss (Horizons/ICRW, Washington DC) for critical review of this research report.

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted odds ratio
ARRM	AIDS Risk Reduction Model
ARV	Anti-retroviral
BCC	Behavior Change Communication
CBOH	Central Board of Health
CDEs	Classified daily employees
CI	Confidence Interval
CME	Continuing Medical Education
CRS	Catholic Relief Services
FGD	Focus Group Discussion
HIV	Human Immunodeficiency Virus
IDI	In-depth interviews
INESOR	Institute of Economic and Social Research
JSI/R&T	John Snow Inc. Research & Training Institute, Inc
LGH	Livingstone General Hospital
NUD*IST	Non-Numeric Unstructured Data * Indexing, Searching and Theorizing
NS	Not significant
NCH	Ndola Central Hospital
OR	Odds Ratio
PEP	Post-exposure Prophylaxis
PLHIV	Person[s] Living with HIV
SHARe	Support to the HIV/AIDS Response in Zambia
STI	Sexually Transmitted Infection
PEPFAR	Presidential Emergency Fund for AIDS Relief
UNZA	University of Zambia
VCT	Voluntary Testing and Counseling
ZDHS	Zambia Demographic and Health Survey
ZHECT	Zambia Health Education and Communication Trust
ZIHP	Zambia Integrated Health Program
ZIHPSERV	Zambia Integrated Health Program (service delivery)
ZIHPCOM	Zambia Integrated Health Program (communication)
ZMA	Zambia Medical Association
ZNA	Zambia Nurses Association

Executive Summary

The objective of the "Caring for the Caregiver" initiative was to develop and test an HIV risk-reduction workplace program for hospital staff. This was motivated by the recognition that hospital workers are often overlooked in HIV programming, and yet many are infected or affected by HIV. It was also motivated by the fact that a hospital's workforce is heterogeneous, ranging from custodial workers to highly-trained surgical specialists, and therefore have varying levels of HIV literacy and varying needs for information and support. Thus, HIV prevention, treatment, and care interventions should involve health care workers not just as a means to reach the community, but as direct and priority beneficiaries as well.

We designed a peer education intervention and implemented it in two Zambian hospitals in Ndola and Livingstone, with a total of 1,700 employees. To evaluate the intervention we used a quasi-experimental design, with three other hospitals in Ndola, Kitwe, and Choma serving as comparison sites. In January 2004 we collected data from hospital workers using a cross-sectional baseline survey. The intervention began about eight months later, and a follow-up survey was conducted in February 2006. The intervention was implemented by 79 trained peer educators using an audience-driven manual.

The baseline sample comprised 1,424 hospital workers, and the follow-up 1,336. With slight variations between the baseline and follow-up rounds, about 5 percent of the study samples were comprised of doctors, about 3 percent were clinical officers, a quarter to a third were nurses, just over ten percent were paramedical personnel, a similar percentage were administrative staff, about 4–9 percent were students and from 30 to 40 percent were "Classified Daily Employees."[1] Half the respondents in the follow-up survey reported that they had a family member die of AIDS or was currently infected with HIV.

At follow-up, a quarter of the hospital staff in the intervention sites said they had participated in the intervention, 37 percent were aware of it but had not participated, and 39 percent were not aware of it. Men were more likely to have attended intervention activities than women.

Of the staff who participated in the intervention, 97 percent said it should be continued. About 83 percent also said that they had taken direct action as a result of the program: half or more had talked to a spouse, family member or friend, continued to be faithful, or become more conscious and taken special care to avoid HIV. Nearly 30 percent said they got tested for HIV, started or continued using condoms, reduced partners, or started to abstain.

Multivariate regression analysis showed strong dose-response associations between the intervention and many beneficial outcomes, including higher HIV knowledge, a lower level of stigmatizing attitudes and beliefs, and greater awareness of post-exposure prophylaxis (PEP). For example, respondents who participated in the intervention were nearly three times as likely as those who were unaware of the intervention to have high AIDS knowledge, 1.7 times more likely to have a low level of stigma, and 5.5 times more likely to know about PEP. They were also 2.4 times as likely to have positive attitudes and knowledge about male condoms and 3.9 times more likely to know where to get female condoms. The intervention was associated with other desirable outcomes, such as a greater sense of empowerment to influence how their hospitals handled HIV-related issues.

[1] In Zambia, custodial staff are called "Classified Daily Employees", colloquially referred to as CDEs. They are comprised of janitorial staff, catering workers, laundry aides, sanitation workers, outdoor gardening staff, utility plant maintenance personnel, porters and similar support workers.

Those who participated were also 70 percent more likely to have been tested for HIV, although only 40 percent of hospital staff were aware of their own HIV status, and 40 percent knew their partner's status. Respondents in the intervention sites reported a reduction in multiple partners, from 26 percent to 14 percent ($p < .0001$), but there was little change among those in the comparison sites (21 percent at baseline and 22 percent at follow-up, $p = 0.538$). There was also an increase in ever-condom use among respondents with multiple partners over the previous 12 months in the intervention sites, rising from 57 to 75 percent ($p = 0.016$), whereas in the comparison sites, it remained largely unchanged (~72 percent; $p = 0.983$).

This research documents that a workplace program for hospital staff is feasible and can have many beneficial outcomes. It provides a useful model that other hospitals could draw on.

Introduction

Background

A functioning and effective health care system is critical if the health of Zambia's people is to be maintained and their productivity maximized. The country's hospital staff is charged with meeting the needs of their patients, including advising them about HIV prevention, treatment, and care. However, few programs examine the HIV-related needs of hospital staff themselves, including how they are coping with the epidemic in their private and personal lives. Data from the Zambia Central Board of Health (CBOH) show that by 1999, 41 percent of nurse attrition was due to death, a much higher figure than the 28 percent due to resignation and 27 percent from retirement (Orobaton et al. 2001). An earlier study found that nurse mortality in Zambia had risen more than ten-fold between 1980 and 1991, from 2.0/1000 to 26.7/1000 (WHO 1997). In short, Zambia's health care system is being decimated by HIV morbidity and mortality among staff.

There has been little research on HIV incidence or prevalence among hospital staff worldwide, and even less on modes of transmission among those infected. Recent evidence from South Africa suggests that HIV prevalence among health care personnel may not be all that different from the general population (Shisana et al. 2006). The most recent Zambia Department of Health Survey (ZDHS) shows that HIV prevalence among women in Zambia is 18 percent, compared to 13 percent among men (CSO 2003). It is likely that figures for hospital workers in Zambia are similar to these.

Since health care workers are caregivers, their position in the family may make it difficult for them to seek or find help when they are in need (WHO 1997). Family members may be at a loss about how to care for a nurse or doctor, since the converse is usually the case. In addition, since hospital staff are known in the health care setting, it may be hard for them to seek treatment due to issues of stigma and confidentiality. Moreover, hospital staff may have the same discomfort many adults have discussing sensitive personal issues, such as HIV/AIDS, with providers. Medical doctors may have an even greater handicap in seeking help. Because they are often the ones who treat and cure patients, it may be even more difficult for them to admit when they need support themselves. In addition, the nature of health care work with long hours and unpredictable night schedules may complicate personal issues at home. These situations may strain health care workers' ability to practice HIV prevention behaviors, including seeking couples testing and counseling, and negotiating safer sex.

Institutional Responses

Like most countries in Africa, Zambia has been implementing a wide array of activities to combat HIV. Efforts to educate health care workers are also being conducted. For example, the Zambia General Nursing Council and other medical institutions began integrating HIV/AIDS education into the pre-service curriculum in 2003. However, there have been few workplace programs for hospital staff. The main workplace intervention for medical personnel has been carried out by the Zambia Nurses Association (ZNA), which has been implementing activities for its members over the past several years. But this program has been limited to nurses, leaving the HIV-related needs of other hospital workers unmet. In 2006, the government began providing PEP more widely for hospital staff; prior to that it had been largely available only for victims of rape.

Justification for the Intervention

This intervention was motivated by the need to develop workplace activities for hospital employees in Zambia in order to help them cope more effectively with HIV-related issues. Known as the "Caring for Caregivers Project," it aimed to help hospital staff better assess their risk of HIV, understand their options for risk reduction, protect themselves against HIV, and for those who were infected, to live positively with the virus. Because hospitals have a diverse workforce with many nonclinical staff, such a program needed to be audience sensitive. Therefore, the program aimed to be responsive to the needs of administrative and clerical professionals, custodial, maintenance and catering workers, as well as other technical and nontechnical employees. Because some hospitals are also training institutions linked to universities, the intervention was designed to include these trainees as well.

This report presents the evaluation results of the project. The research was conducted by the Horizons Program in partnership with the University of Zambia Institute for Economic and Social Research (INESOR). The intervention was implemented by the Zambia Medical Association (ZMA) and the Zambia Health Education and Communication Trust (ZHECT). It was funded by the United States Agency for International Development (USAID), through the Zambia Integrated Health Program (ZIHP).

Research Questions

The following research questions were explored:

1. Will a work-based program targeting hospital staff improve their HIV-related knowledge, attitudes, and behaviors?
2. Will the intervention reduce the level of stigma among hospital staff?
3. Will the intervention increase the proportion of hospital staff who get tested for HIV?
4. Can hospital staff successfully influence hospital policies to reduce their risk of HIV?

The outcomes envisioned were:

- Improved knowledge and attitudes about HIV among hospital staff.
- Increased adoption by hospital staff of HIV-preventive behaviors, including condom use and partner reduction.
- Increased utilization of HIV testing and counseling services.
- Improved coping, care, and support mechanisms for hospital staff.
- Positive changes in infrastructure, policies, and administrative factors to reduce HIV risk among hospital staff.
- A tested approach on how to address the prevention and care needs of hospital staff in an African setting.

Description of the Intervention

The Zambia Caring for Caregivers Project was a hospital workplace program based on a peer education strategy guided by an audience-driven peer educators' manual. Within each hospital, the project worked through the administrative structures to designate a focal point person. The project started in 2004 with a baseline survey of 1,424 hospital workers as well as in-depth interviews (IDIs) and focus group discussions (FGDs) with 200 others. Data were collected in the two intervention and the three comparison hospitals participating in the research.

Ndola Central Hospital and Livingstone General Hospital were selected as intervention sites where the project would be tested, while Choma General Hospital, Kitwe Central Hospital, and Arthur Davison Hospital were selected as delayed comparison sites. The results from the baseline research were used to refine the intervention and the related communication materials, including the peer education manual. The intervention was designed and supervised by ZMA, and implemented by ZHECT.

The actual project activities comprised the following:

Sensitization of hospital staff: ZMA and ZHECT held workshops for all hospital employees in the intervention sites to cover the project's key topics and prepare hospital employees for peer education activities. Just over 40 percent (700 out of 1,700) of the hospital staff in the intervention sites attended.

Peer education activities: A peer education manual was adapted from existing workplace manuals, and tailored for the hospital setting. The manual covered the following topics: Understanding HIV and AIDS, Prevention of mother-to-child transmission (PMTCT), STIs, HIV treatment, Opportunistic infections, VCT, Positive living, Stigma, Nutrition, Gender, and Communication. The manual was carefully reviewed by clinical and lay staff to ensure that it included the appropriate level of medical content.

In consultation with ZHECT and ZMA, a total of 79 hospital staff were selected by hospital staff to be trained as peer educators in the two hospitals. These peer educators represented a variety of disciplines, from nurses to personnel managers to store keepers and support staff. It was anticipated that each peer educator would reach 10 to 15 colleagues. Training was conducted in August 2004 over a 7-day period. In each hospital, the peer educators worked with their colleagues to develop action plans for the year. Each hospital department developed work plans for itself and embarked on once a week education sessions. Hospital management frequented the meetings and occasionally provided support materials and refreshments. During the intervention, peer educators documented their activities in a diary, which was submitted to the study monitoring officer during supportive supervision visits.

Behavior change communication (BCC) materials: ZMA was aware of numerous BCC materials already being used in Zambia. Therefore, it reprinted these materials and distributed them to hospital staff. The materials consisted of posters and seven topic-specific brochures on stigma and discrimination, HIV prevention, condoms, HIV testing, communication with children, positive living, and care and support for PLHIV. These brochures also contained lists of HIV testing sites and other resources available in Zambia. In addition, the project used previously developed Zambian videos and other audio-visual materials on HIV/AIDS.

Peer support groups: The project encouraged hospital staff to form pre-and-post-test clubs in order to provide psychosocial support. In both hospitals, the staff organized peer support groups that met to discuss and share information and experiences with each other and to undertake activities such as income generation, visiting infected hospital staff and providing financial support for orphans of hospital staff. In one of the hospitals, the peer support group began to offer male circumcision for a fee, to support ailing colleagues.

Care and support for hospital workers living with HIV: At the inception of the project, ARVs were just becoming available in the two experimental sites, but many HIV-positive providers were reluctant to access them. The project encouraged hospital staff to seek ARVs for themselves or their loved ones. However, over time, ARVs became more widely available in Zambia, as part of PEPFAR and United Nations Global Fund initiatives.

Promotion of VCT: The project encouraged hospital staff to seek HIV testing at a facility of their choice. A list of VCT sites was compiled and shared widely in the hospitals. The initial plan to provide coupons allowing hospital employees access to free VCT visits was abandoned due to the stigma it would generate. In one hospital, the facility's management became concerned at the lack of HIV counseling facilities for staff, and embarked on creating a counseling room. In the other intervention hospital, a facility for staff counseling was already available, and the hospital management strengthened and supported it.

Education about post-exposure prophylaxis (PEP): The increasing access of ARVs led to greater availability of PEP in hospitals in Zambia. Therefore, the project educated hospital staff about PEP and its proper use. Concurrently, study hospitals started reviewing their guidelines about universal precautions and access to PEP.

Access to condoms: In most workplace programs in Zambia, condoms are available and can be obtained in privacy in washrooms and other unobtrusive locations. However, at the hospitals, condoms were normally kept in the pharmacy or MCH/FP departments, and hospital staff who wanted condoms would have to get them there. This discouraged many from seeking them. Therefore a major objective of the study was to increase condom access points and reduce the social costs associated with their use. Condoms are now located in strategic places in the hospital, such as staff toilets, nurses stations, reception desks, ward offices, doctor's common rooms, and other appropriate locations. In addition, they are distributed at peer education sessions.

Other activities: Hospital staff were encouraged to be innovative and engage in other activities as part of the Caring for Caregivers Project. For example, some organized World AIDS Day events, while others organized sports activities. The hospital management supported such events by purchasing t-shirts and banners for the staff. The facilities also supported HIV counseling and testing activities for staff. For example, in one of the hospitals, the management became concerned about the lack of HIV counseling and testing facilities for the employees, and created space where a private counseling room could be established. In some peer education groups, employees realized the importance of partner involvement and some brought their spouses from time to time. Other hospital staff were invited by local media to provide education to the public.

Peer educators were charged with mobilizing their colleagues to attend sessions, usually during lunch time. Sessions were held once or twice a month, depending on the department. In some cases, topics were doubled up or repeated. Some departments would combine resources and conduct the sessions together. Peer educators were also encouraged to invite external experts and resource persons to provide further information to the staff.

Theoretical Framework

The project drew from three behavior change theories:

1. AIDS Risk Reduction Model (ARRM): The ARRM posits that change is a process that involves three major steps: first the person has to label his or her behavior as risky (labeling stage); second s/he must commit to change (commitment stage); and third s/he must seek to enact the change (enactment and help-seeking stage) (Peterson and DiClemente 2000). The intervention focused on steps that individuals could take as part of the risk-reduction process.

2. Theory of Social Capital: The Theory of Social Capital asserts that social life—networks, norms and trust—enable participants to act together more effectively to pursue shared objectives (Kreuter and Lezin 2002; Fukuyama 1999). This theory guided the intervention activities in order to promote social cohesion and social inclusion, and to strengthen the ability of hospital staff to intervene on their behalf (collective efficacy). Examples of such activities included the formation of peer support groups, and activities that helped hospital staff seek changes in the workplace (e.g., development of PEP guidelines).

3. Theory of Gender and Power (Connell 1987): This theory posits that HIV behavior is guided by gender-power dynamics even in the face of obvious risks. Therefore, for example, men may engage in risky sex because multiple partnerships are accepted expressions of masculinity. Women may refrain from carrying condoms because they may be termed "loose." The Theory of Gender and Power was used to guide discourse on male-female dynamics as part of the intervention.

Study Methods

The evaluation of the Caring for Caregivers Project was based on a quasi-experimental design with two hospitals as the intervention sites, and three as the comparison sites. Collectively, these five hospitals had a workforce of 3,000 employees. The sample size was powered to detect a 10 percent difference between baseline and follow-up for the variable "sought VCT" (baseline levels about 25 percent) with 95 percent confidence. This required a minimum of 259 respondents for each comparison cell. Respondents represented the range of employees from doctors to nurses to custodial workers. The sample was constructed to reflect the actual distribution of hospital workers in each facility by obtaining percentages of various cadres from the personnel departments, and then using that to calculate the expected sample subgroup for each cadre.

The study used both qualitative and quantitative methods. The qualitative methods comprised of focus group discussions (FGDs) and in-depth interviews (IDIs). The baseline data were collected in January 2004 and the follow-up data in February 2006. The study had been reviewed for ethical adherence and approved by Horizons as well as by the Tropical Diseases Research Center (TDRC), one of Zambia's three Institutional Review Boards. The same research team from the University of Zambia conducted both the baseline and follow-up surveys, and the same procedures were followed during both rounds of data collection.

Data Collection Tools

Both the questionnaires and FGD/IDI guides were designed and pretested several times before being finalized. The questionnaires were color-coded according to sex allowing appropriate wording of gender-specific questions. The questions were largely multiple choice and self-administered. However, certain cadres of hospital staff (custodial staff, referred to as Classified Daily Employees[2] in Zambia) were not literate in English, and therefore data collection with them was done face-to-face. For these respondents, the questionnaires were translated into the relevant language groups, standardizing the manner in which questions were phrased. They were administered by interviewers fluent in the specific language.

Interviewer Training

During both rounds, about 40 interviewers were recruited. All were University of Zambia Masters level students with experience in data collection. Interviewer training lasted two days, and was overseen by University of Zambia and by ZMA, with technical assistance from Horizons. The training consisted of role plays, and included a field pretest with hospital staff in local facilities nearby.

Field Work

In order to cover a cross section of hospital staff, the health care facility was stratified by departments and cadres proportionate to their size in the hospital. The interviewers were assigned specific targets

[2] In Zambia, custodial staff are called "Classified Daily Employees", colloquially referred to as CDEs. They are comprised of janitorial staff, catering workers, laundry aides, sanitation workers, outdoor gardening staff, utility plant maintenance personnel, porters and similar support workers.

by cadre, in order to enable adequate representation in the sample. Within each department, hospital workers were randomly selected for interviewing, and data collection was arranged in such a manner as to enable data collection during the night shift as well as the day shift. FGDs and IDIs were also conducted at appropriate times. Fieldwork usually lasted about a week during each round.

Data entry and analysis

Once fieldwork was over, questionnaires were logged in and data were double-entered using EPIDATA. Internal consistency checks were incorporated. Analysis was conducted using STATA 9.0. Open ended questions were coded separately, and re-integrated. FGD and IDI transcripts were typed and analysis was conducted using NUD*IST. The survey data was analyzed using univariate, bivariate and and multivariate analysis. For bivariate analysis, the measure of association was the chi-square. For multivariate analysis, it was the odds ratio, as generated through logistic regression (Hosmer and Lemeshow 2000).

The project anticipated that some changes might occur in the hospital settings as a result of structural changes. In addition, it was expected that the project might impact on individual knowledge, attitudes, and behaviors. In order to discern these differences, respondents were classified into three groups: a) having participated in the intervention; b) being aware of the intervention but not participating in it, and c) not having been aware of the intervention. For the odds ratio, the reference group was the last category, and was assigned an odds ratio of 1.00. Multivariate analysis was restricted to the follow-up data in the intervention sites.

Results

Demographic Characteristics

The sample size at baseline was 1,424. During management of the follow-up data, 125 survey participants indicated that they had participated in a simultaneous intervention implemented by the Zambia Nurses Association. These respondents were excluded from the analysis, which resulted in a final follow-up sample of 1,336. Table 1 presents the characteristics of the respondents. More than half were women. The largest occupation grouping (about 40 percent) was CDEs, followed by nurses. Because of the small number of medical doctors and clinical officers in the hospitals, these two groups were combined during subsequent analysis. About half the respondents were married across the two study rounds and across the two study groups. Respondents had worked in the index facility for a mean of six years, with no differences between rounds or study groups (data not shown).

Table 1 Demographic characteristics of the study population

Characteristic	Intervention sites		Comparison sites	
	Baseline (n = 748) %	Follow-up (n = 687) %	Baseline (n = 676) %	Follow-up (n = 649) %
Sex				
Female	59	54	54	52
Religion				
Non-catholic	76	74	72*	77*
Catholic	24	26	28	33
Occupation				
Doctors	4	3	4*	6*
Nurses	29	23	33	26
Clinical officers	2	3	3	3
Paramedics	8	11	14	9
Administration	11	11	12	11
CDEs	37	39	30	41
Students	9	10	4	4
Marital status				
Married	51	50	58	56
Single (never married)	33	36	31	32
Cohabiting	2	2	2	3
Divorced/separated/widow	13	12	9	9

*Baseline-follow-up differences for the demographic grouping statistically significant ($p \leq 0.05$).

The mean age of the respondents was 34 years, with no significant differences between study rounds in the intervention sites (baseline = 34.1; follow-up = 33.3, $p = 0.123$). In the comparison sites however, the baseline sample was older, compared to follow-up (baseline = 34.0, follow-up=32.8, $p = 0.009$).

Intervention Participation, Perceived Benefits, and Actions Taken

Participation

During the follow-up round of the study, all the respondents were asked whether they had ever heard of the Caring for Caregivers intervention. The interviewer described the intervention and showed the respondents some of the materials that had been distributed in the health facilities. Almost three-quarters (71 percent) of the hospital employees at the intervention sites said they had heard of the program, but so had 30 percent in the comparison sites. Those who said they had heard of the program were asked whether it was being implemented at their health facilities. At the intervention sites, 87 percent of the employees confirmed that the program was being implemented in their hospital, as did 33 percent of those in the comparison sites, likely due to confusion with the ZNA intervention.

Among respondents in the intervention sites, 39 percent of those who had heard of the program said they had participated. Thus, of all the 687 intervention site respondents in the follow-up survey, 23 percent (n = 161) had participated, and for purposes of this report, are classified as "participated in the peer education sessions." Another 252 had heard of the program but did not attend and these are classified as "aware but did not participate," and 269 had not heard of it at all (classified as "unaware").

Men were more likely to have participated in the intervention than women (29 percent vs. 19 percent; $p = 0.007$). Administrative staff made up the largest group of participants (37 percent), followed by paramedics (27 percent), CDEs, medical doctors/clinical officers (25 percent each), nurses (19 percent), and students (10 percent).

In general, medical doctors, nurses, and students were the most likely to not be aware of the intervention (53 percent, 48 percent, and 58 percent respectively). CDEs were the most likely to have been aware of it but not have participated (42 percent). Those who participated in the intervention had been employed at the hospital longer (8.1 years compared to around 5.7 years for those who were aware but did not participate, and 5.1 years for those who were unaware, $p < 0.001$). Intervention participants were also older, with an average age of 36 years compared to 32 years each for the other two groups.

The 161 respondents who were exposed to the intervention were asked how often they had participated. About one-fifth (19 percent) had participated 3–4 times a month, just over a third (36 percent) had participated 1–2 times a month, 24 percent had participated at other times, and 20 percent could not recall how often.

Those who reported attending peer education sessions were asked what activities they participated in. The most frequently attended programs were HIV awareness and sensitization meetings (58 percent) and other discussions about HIV/AIDS in the hospital units (57 percent). Other activities included peer education group meetings (42 percent), social activities such as soccer games during World AIDS Day (32 percent) and peer support group meetings (30 percent).

At both baseline and follow up, respondents were asked the number of times in the preceding six months they had sought to learn more about HIV/AIDS. At follow-up in the intervention sites, there were statistically significant increases in the number of hospital employees who had undertaken these activities (see Table 2) compared to baseline. For example, those who had read a brochure/pamphlet about HIV/AIDS four occasions or more increased from 41 percent to 52 percent ($p \leq 0.05$), but remained unchanged in the comparison sites. Those who had discussed HIV with someone during four occasions or more rose from 46 percent to 51 percent ($p = 0.04$) in the intervention sites but

declined in the comparison sites. Of eight such actions examined, there were statistically significant improvements in seven of them among respondents in the intervention sites. In the comparison sites, there were statistically significant improvements in only one.

Table 2 Percent of respondents who undertook the listed activities to learn about HIV/AIDS in the last 6 months

Activity	Intervention sites		Comparison sites	
	Baseline (n = 748)	Follow-up (n = 687)	Baseline (n = 676)	Follow-up (n = 649)
Read a brochure/pamphlet 4+ occasions	41*	53*	36*	34*
Saw a poster 4+ occasions	75*	84*	74*	70*
Watched a video 4+ occasions	25*	35*	26	28
Attended a seminar	31*	41*	38	34
Participated in group discussion	61	61	61*	52*
Sought HIV counseling or information	37*	50*	38*	44*
Discussed HIV/AIDS 4+ occasions	46*	51*	47*	44*
Took material home to read	74*	81*	71	72

*Baseline-follow-up differences significant at $p \leq 0.05$

Information obtained

Those who took part in the Caring for Caregivers Project were asked what kind of information they had gained from the project. The most commonly-mentioned information was facts about HIV, followed by HIV testing, and stigma (Figure 1).

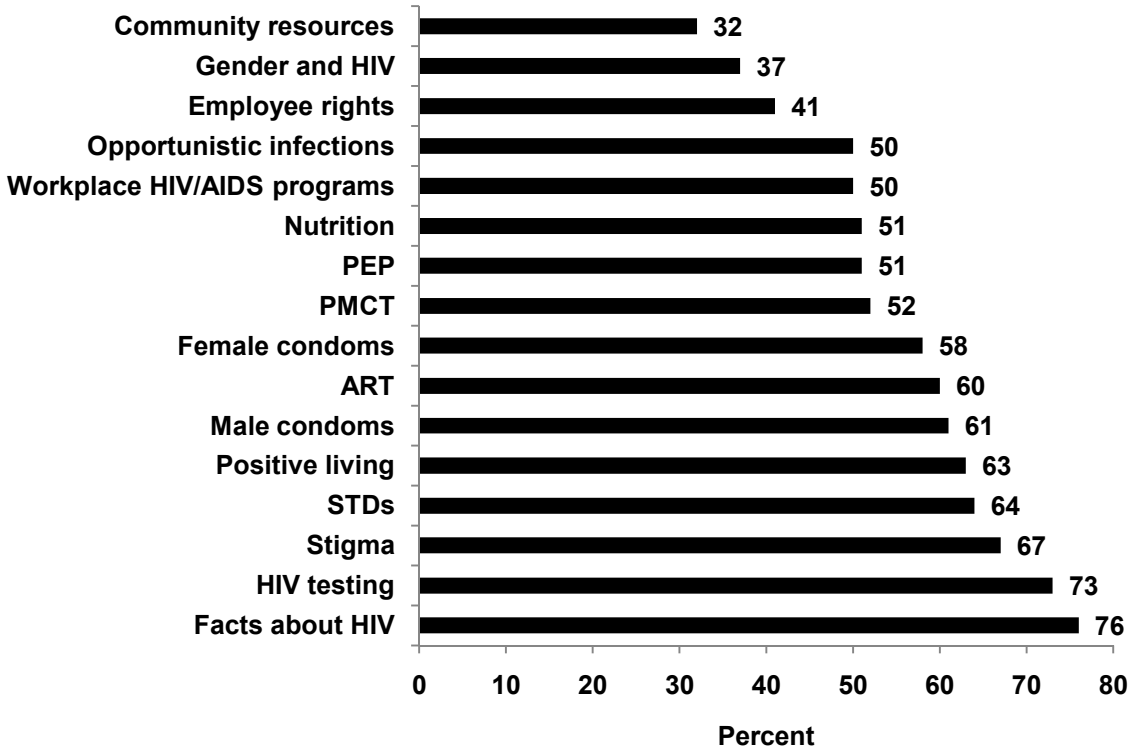
Using a 14-item checklist, participants were asked about the benefits of the intervention. The most common responses were improving access to condoms, providing HIV knowledge, improving access to ARVs, and encouraging HIV testing, each reported by over 80 percent of the participants (Figure 2). As one of the nurses commented:

> *In most cases like us nurses we thought we knew most of the things but then when we got the materials we found that we actually do not know most of the things. For example I would say things like "condoms break" and whatever. But I found it was the usage itself that I did not know. Another one was on opportunistic infections. We thought that whenever you have one, it means you have HIV/AIDS.*

Similar sentiments were expressed by a peer educator:

> *We thought health care workers knew of HIV/AIDS, but through discussions, we discovered they needed more information…. The intervention has really done something wonderful….. Now people have known that HIV is a disease, just like any other disease….*

Figure 1 Information obtained as a result of participating in Caring for Caregivers, follow-up survey, intervention sites

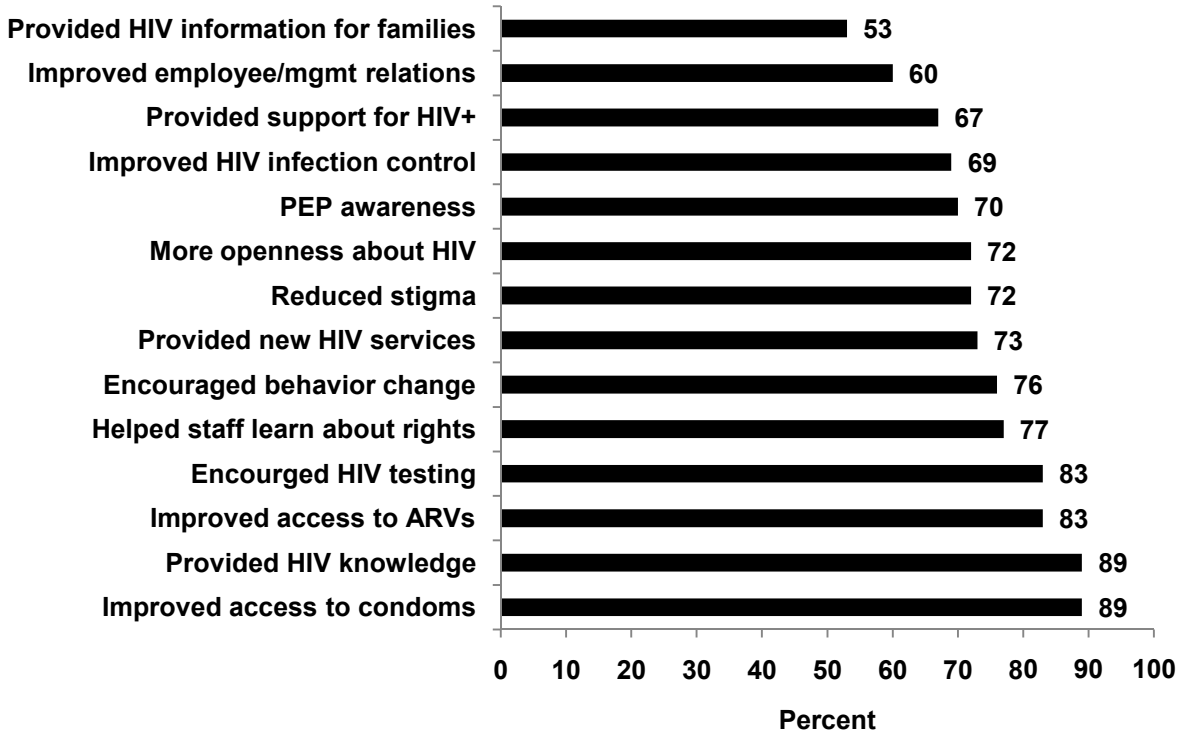


n = 161 hospital staff project participants; multiple responses possible

A hospital manager in one of the intervention sites observed that the project had increased access to condoms:

> *…condoms are left in staff toilets, offices by peer educators…. People have access and they are using them.*

Figure 2 Benefits of participating in the Caring for Caregivers project, follow-up survey, intervention sites

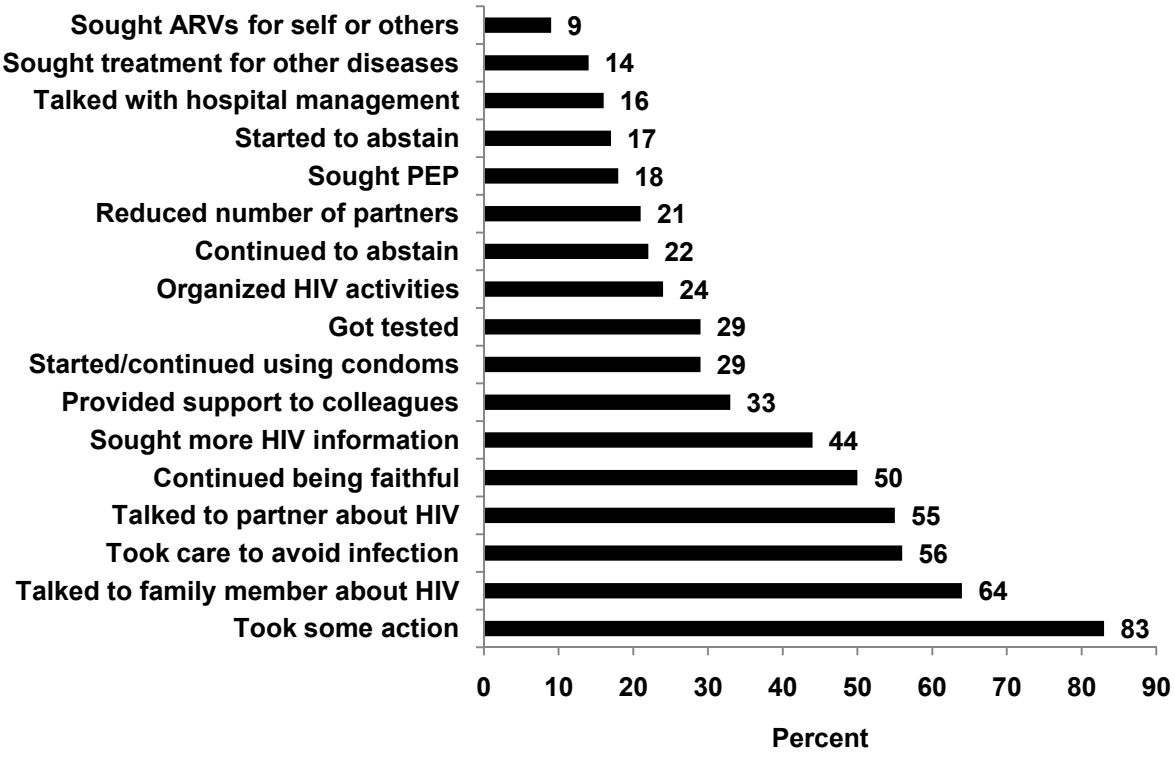


n = 161 project participants; multiple answers possible

Actions taken as a result of participation

Participants were asked whether they had done anything or taken any specific action following participation in the program. Most (83 percent) reported taking some action: a half or more had talked to a family member or partner, continued to be faithful, or became more conscious and taken special care to avoid HIV (Figure 3). Nearly 30 percent took other direct action including getting tested, starting to use or continuing to use condoms, reducing the number of partners, or starting to abstain from sex.

Figure 3 Actions taken as result of participation in Caring for Caregivers, follow-up survey, intervention sites (%)



n = 161 project participants; multiple answers possible

Respondents were also asked whether the intervention should be continued and most (97 percent) said it should. As the managers in the two participating hospitals said:

> *It should be continued because people should learn more about those new developments in HIV/AIDS because not all of us know…. Though we are medical people we do not know everything about HIV/AIDS...if you continue educating us, we will be well informed.*
>
> Hospital manager

> *[The program] has softened the blow. HIV is no longer a disease of outside, of only the patients. It is also our disease. So now we understand each other, we care for each other….*
>
> Hospital manager

Changes in HIV Knowledge

One of the goals of the project was to increase the level of HIV/AIDS knowledge among hospital staff. To assess whether this had occurred, respondents were asked the following true/false questions at baseline and follow-up:

- More women are infected with HIV than men in Zambia (True)
- HIV and AIDS are the same thing (False)
- Someone can be infected with different types of HIV at same time (True)
- If you go for VCT, you must also take the HIV test (False)

Responses were combined into a score in which respondents could answer from zero to four questions correctly. For analysis, the respondents were grouped into those who answered three or four questions correctly compared to those who answered zero to two questions correctly.

The results are presented in Table 3 and compare baseline versus follow-up survey results in the intervention and comparison sites, and by participation status at follow-up. Respondents from both intervention and comparison sites demonstrated similar levels of improvement in knowledge between baseline and follow-up: 36 percent to 45 percent in the intervention sites and 37 percent to 48 percent in the comparison sites. In the intervention sites, 54 percent of project participants had high knowledge compared to 41 percent of those who were aware of the program but did not attend and 43 percent of those who were unaware of the program ($p < 0.001$).

Logistic regression analysis allowed comparisons based on awareness and participation. Attendees of peer education sessions were 2.8 times more likely to have a high level of HIV knowledge than those who were aware but did not attend (AOR 1.7; CI: 1.7-4.6) compared with those who were unaware of the intervention (Table 4).

Table 3 Bivariate analysis showing impact of Caring for Caregivers on selected items

Outcome	Intervention sites					Comparison sites	
		Follow-up					
			Level of participation in intervention				
	Baseline (%)	All (%)	Participated (%)	Aware but did not participate (%)	Unaware (%)	Baseline (%)	Follow-up (%)
High HIV knowledge	36*	45*	54†	41†	43†	37*	48*
No/low stigma	61*	78*	81	80	72	57	69
Very concerned about being infected with HIV at work	75	72	76	69	72	73	71
Know what PEP is	26*	40*	52†	35†	35†	23	42
Provided a constructive response regarding infection risk	68*	75*	86†	73†	71†	72	75
High level of condom knowledge	50*	56*	67†	56†	49†	50*	57*
Access to male condoms now extremely easy	59*	77*	85†	77†	74†	52	51
Know where to get the female condom (among all)	64	66	83†	63†	61†	59*	67*
Believe hospital staff can have impact	55*	64*	73†	66†	56†	61	56
Colleague has confided	19*	35*	52†	29†	28†	19*	30*
Family member has or had died of HIV/AIDS	30*	51*	57†	50†	44†	40*	48*
Place of treatment preference	62	69**	77††	75	56	60	63
Has multiple partners (among sexually active)	27*	14*	11	19	12	21	22
Been tested for HIV	25*	40*	49†	38†	37†	31*	40*
n	748	687	161	252	197	676	649

*Differences between baseline and follow-up statistically significant ($p \leq 0.05$);
†Differences by exposure statistically significant at $p \leq 0.05$

Table 4 Logistic regression results showing correlation between level of awareness and participation in Caring for Caregivers and selected outcomes^

	Adjusted Odds Ratio	95% CI
High HIV knowledge		
Unaware	1.0	
Aware but didn't participate	1.7	1.1–2.6
Participated	2.8	1.7–4.6
No/low stigma		
Unaware	1.0	
Aware but didn't participate	1.6	1.0–2.47
Participated	1.7	1.0–2.93
Know what PEP is		
Unaware	1.0	
Aware but didn't participate	1.6	1.0–2.7
Participated	5.5	2.9–10.2
Provided constructive response about what would do if infected at work		
Unaware	1.0	
Aware but didn't participate	1.1	0.7–1.7
Participated	2.5	1.4–4.4
High condom knowledge-attitude score		
Unaware	1.0	
Aware but didn't participate	1.5	1.0–2.3
Participated	2.4	1.5–3.8
Says finding male condoms at work extremely easy		
Unaware	1.0	
Aware but didn't participate	1.1	0.7–1.6
Participated	1.7	1.0–2.9
Knows where to get female condom		
Unaware	1.0	
Aware but didn't participate	1.2	0.8–1.8
Participated	3.9	2.3–6.8
Believe employees can have impact at work		
Unaware	1.0	
Aware but didn't participate	2.0	1.4–3.0
Participated	2.6	1.6–4.1
Where treated		
Unaware	1.0	
Aware but didn't participate	1.7	1.1–2.6
Participated	1.7	1.0–2.8
Been tested for HIV		
Unaware	1.0	
Aware but didn't participate	1.1	0.8–1.6
Participated	1.7	1.1–2.6

^Controlling for sex, age, and cadre

Changes in Stigma

The project examined the impact of the intervention on stigma among hospital staff. A series of six questions were asked to assess the extent to which the respondents hold stigmatizing beliefs, feelings, and attitudes (Table 5). The responses were aggregated into one variable by assigning a score of one for each stigma-free response, adding these scores for each respondent, then dichotomizing a new variable contrasting those who scored 5 or 6 (low stigma) with those who scored 4 or less (high stigma). The questions and the stigma-free responses are listed below.

Table 5 Questions about stigma

Survey question	Stigma-free response
1. Would you be willing to care for an HIV+ relative in your home?	Yes
2. Would you buy food from an HIV+ shopkeeper?	Yes
3. How angry do you feel towards people with AIDS?	Not at all
4. How afraid do you feel towards people with AIDS?	Not at all
5. People with AIDS should be separated from others.	Strongly disagree
6. People who got AIDS through sex have gotten what they deserve.	Strongly disagree

Overall, the percent of respondents with a low level of stigma rose from 61 percent to 78 percent in the intervention sites ($p < 0.001$), and from 57 percent to 69 percent in the comparison sites ($p < 0.001$; see Table 3). However, multivariate analysis showed that intervention participants scored better than non-participants: those who attended were 1.7 times more likely to have a low level of HIV-related stigma compared to those who were unaware of the project, suggesting a modest impact of the intervention on stigma.

Concerns About Occupational HIV Risk

Risk of infection

Participants were asked how concerned they were about being infected with HIV at work. Reponses could be "very concerned," "somewhat concerned," "not concerned at all," and "don't know." ("Not applicable" was used for those without direct patient contact.) The data suggest that employees are extremely anxious about occupational risk, with nearly three-quarters of respondents in both groups saying they were "very concerned" at baseline and at follow-up (Table 3).

In the intervention sites, follow-up data indicated that nurses (93 percent) were the most likely to be "very concerned" about occupational HIV infection, followed by students (91 percent), medical doctors (90 percent), clinical officers (82 percent), paramedics (80 percent), administrators (58 percent), and CDEs (55 percent). A similar pattern was found in the comparison site follow-up sample.

Caring for Caregivers did not directly address infection control issues, guidelines, equipment, and supplies in the hospital, therefore regression analysis for this variable was not conducted. Rather, it

was anticipated that the intervention could provide an opportunity for employees to raise their concerns with the hospital management, and the results suggest that they remain quite anxious.

Post-exposure prophylaxis

Given the level of concern about occupational risk, knowledge of PEP is essential. When queried about PEP, participants' knowledge increased between baseline and follow-up, from 26 percent to 40 percent ($p < 0.001$) at the intervention sites, and from 23 percent to 42 percent ($p < 0.001$) at the comparison sites (Table 3). In the intervention sites, increases in knowledge were mainly among clinical care providers. For example, among nurses, awareness rose from 33 percent to 77 percent ($p < 0.001$), among clinical officers from 31 percent to 73 percent ($p = 0.007$), and among paramedical staff from 39 percent to 59 percent ($p = 0.023$). Non-significant increases were seen in administrative staff, CDEs, and students. But only 10 percent of CDEs and 28 percent of administrative staff reported awareness of PEP at the follow-up survey. Students too remained poorly informed; only 39 percent reported awareness of PEP. Medical doctors remained the most informed, with over 80 percent at both rounds reporting awareness of PEP. Similar findings were found in comparison sites.

There was an association between participation in the intervention and awareness: while only 39 percent of those unaware of the intervention had heard of PEP, 35 percent of those who were aware but did not attend had heard of PEP, compared to 52 percent of those who participated (Table 3). Regression analysis supports this pattern, with participants being 5.5 times more likely to be aware of PEP compared to those unaware of the program (Table 4).

Knowledge about PEP was well received by project participants:

> *I think I got full information on PEP from this project. At first, what I knew was that PEP was for doctors. Those of us who are not doctors, no PEP for us, though we are in direct contact with patients. So I learnt more about PEP from this program.*
>
> Nurse

> *I didn't know about this post-exposure prophylaxis… I actually learnt it through this program. I didn't know about it….*
>
> Hospital manager

Respondents were asked what they would do if they thought they were occupationally infected. We characterized responses as "constructive" if they replied that they would get tested, seek treatment, or treat the wound by rinsing. The proportion providing constructive responses rose from 68 percent to 75 percent ($p = 0.003$) at the intervention sites, but remained the same in the comparison sites (72 percent to 75 percent, $p = 0.133$), and was highest among those who attended compared to those who did not attend program sessions (85 percent among participants vs. 73 percent among those aware but did not attend and 71 percent among those unaware; $p = 0.002$). Regression analysis showed that compared to those who were unaware of the intervention, those who attended were 2.5 times as likely to provide constructive answers (CI: 1.45–4.41). As some respondents explained:

> *Before the Caring for Caregivers programme, though PEP was available at this hospital, it was not properly explained for us to know what to do after a prick, accidental exposure to HIV-infected material. But we incorporated it during the training of peer educators and PEP came out… we were also able to formulate policies for PEP in the hospital.*
>
> Peer educator

They sat down and thought of how best to help health care workers in understanding the procedures when one is exposed and how best to protect themselves. That's when they introduced PEP.

Classified Daily Employee

Knowledge, Attitudes, and Access to Male and Female Condoms

Male condoms

Caregivers were presented with nine knowledge and attitude questions about condoms. Responses were scored and a total score could range from zero to nine (Table 6). In order to perform multivariate analyses, the variable was re-coded into a dichotomous format, separating those who scored 7 or higher (high knowledge/favorable attitudes) from those who scored less than 7 (low knowledge/unfavorable attitudes).

Table 6 Condom-related items

Survey question	Desirable response
I believe male condoms decrease a man's sexual pleasure	Disagree
I believe male condoms are quite convenient to use	Agree
I believe male condoms can be reused	Disagree
I believe male condoms are effective in preventing HIV	Agree
I fear I would lose respect if I asked a man/woman to use a condom	Disagree
I would NOT be embarrassed to buy condoms	Agree
I feel that using a condom shows you care for your partner	Agree
I think it is alright for a married woman to ask her husband to use a condom	Agree
I think it is acceptable for a man to offer to use a condom with his wife	Agree

The percent possessing high knowledge/favorable attitude scores increased across both intervention and comparison sites (50 percent to 56 percent in the intervention sites, $p = 0.032$; 50 percent to 57 percent in the comparison sites, $p = 0.013$; Table 3). More than two-thirds (67 percent) of those who participated in the project had high knowledge/favorable attitude scores, compared to 56 percent of those who were aware but did not participate, and 49 percent of those who were unaware of the project. Regression analysis showed a similar pattern: compared to those who were unaware of the intervention, those who attended were 2.4 times more likely to have high knowledge/favorable attitudes of condoms (Table 4)

Access to condoms at work

During the baseline research, hospital staff had lamented about the difficulty of finding condoms discretely at their workplace. As a clinician noted:

No one wants to be seen [getting condoms]…I wish they had designed a system where they could just have these condoms in the toilet. Like one time, I went to the pharmacy and wanted them. When I asked for them [the pharmacy attendants] started laughing…. I have never gone back.

As a result of these findings, the Caring for Caregivers staff made a considerable effort to increase accessibility to condoms. To assess the success of this process, respondents were asked how easy it was to obtain condoms for personal use in the hospital. Table 3 shows the percent saying "extremely easy" rose in the intervention sites from 59 percent to 79 percent ($p < 0.001$). There was no such increase in the comparison sites (48 percent to 50 percent).

At the intervention sites, employees who participated in Caring for Caregivers were more likely than their nonparticipating counterparts to say that access to condoms was now "extremely easy" (85 percent among those who attended vs 77 percent among those aware but did not participate, vs 74 percent among those not aware, $p = 0.021$). Regression analysis found that those who attended sessions were 1.7 times more likely to say that finding condoms at work was extremely easy (Table 4). Peer educators and custodial staff reported:

We identified where condoms could be distributed. Whereas before I think it was just in the Gynae Clinic where the condoms were being given. But after we were trained and new sites were identified, we have a lot of points where we are giving condoms. We have them in outpatients, just on the table, at the registry, we give here in the paramedical center. We have put some even in the staff toilets. So the points where hospital staff can get condoms have been broadened

Peer educator

Respondent 1: *Before the program was implemented, there was a problem of where one could get condoms. But now, you can go, for example, at the Registry point you will find free condoms.*
Moderator: *So, how has it helped?*
Respondent 2: *It has helped in that you are taught either to abstain or use condoms.*
Moderator: *Is it easy to get condoms around here?*
All: *Yes.*
Moderator: *Has it become easier or more difficult over the past years?*
All: *Easier, because there are so many around.*

Classified Daily Employees

Female condoms

Caring for Caregivers also wished to raise the awareness of female condoms among hospital staff as many are female nurses. Most respondents were already aware of the female condom (90 percent at baseline and 95 percent at follow-up in the intervention sites, compared to 91 percent at baseline and 93 percent at follow-up in the comparison sites). The majority of the total sample had also seen a female condom, although this increased from 61 percent at baseline to 75 percent at follow-up in the intervention sites ($p < 0.001$) and from 58 percent to 70 percent in the comparison sites ($p < 0.001$). Nearly all (95 percent) of those who had participated in the intervention said they had seen a female condom, compared to 76 percent of those aware but did not participate, and also 76 percent of those unaware of the intervention.

When asked whether they would use the female condom (or agree to its use by their partner), 41 percent of the intervention site respondents said they "definitely" would, but this remained the same at follow-up (38 percent, $p = 0.632$). At the comparison sites, the percent declined, from 40 percent at baseline to 30 percent at follow-up ($p = 0.004$). Intervention site attendees were more likely than non-attendees to say that they would definitely use the female condom (44 percent for participants, 41 percent for those aware but did not attend, and 32 percent for those who were unaware of the intervention [$p = 0.002$]).

Knowledge of where to get a female condom did not change between baseline and follow-up in the intervention sites (64 percent to 66 percent; $p = 0.29$, Table 3). But closer examination by actual intervention exposure found large differences: while there were no differences between those who were unaware of the intervention and those who were aware but had not attended (61 percent for unaware 63 percent for those aware but did not attend), 83 percent of those who actually participated in the intervention knew where to get a female condom ($p < 0.001$). In regression analysis, those who participated were 3.9 times (CI: 2.25–6.81) more likely to know where to get a female condom compared with those unaware of the intervention (Table 4). However, there were improvements in the comparison sites also: 59 percent of respondents at baseline said they knew where to get a female condom rising to 67 percent at follow-up ($p = 0.003$).

Employee Empowerment, Social Capital, and HIV Burden

Perceived empowerment at work

Hospital staff were asked how much impact they thought they could have in influencing how their hospital handles HIV-related issues. The percent who indicated 'a lot' or 'some' increased at the intervention sites from 55 percent at baseline to 64 percent at follow-up ($p < 0.001$; Table 3). However, the change was in the opposite direction at the comparison sites, suggesting a decline in perceived employee empowerment with the percent of caregivers believing they can have an impact decreasing from 61 percent to 56 percent ($p = 0.077$). In multivariate analysis, exposure to the intervention holds as a significant factor, with those participating 2.6 (CI: 1.6–4.1) times as likely to believe they could influence the hospital "a lot" or "some," compared to those who were unaware of the intervention. (Table 4).

Social capital

Social capital is an indicator of support from peers. Individuals with high social capital are likely to have a wide circle of friends and support systems that they can turn to in times of distress. Employers can foster social capital by encouraging trust, empathy, and solidarity among employees. Peer support groups are examples of ways to build social capital. The Caring for Caregivers project promoted solidarity and social capital among employees by encouraging them to help one another, to tackle HIV together, and to create a supportive environment for infected or affected hospital staff.

One possible marker of social capital in the workplace is whether employees would seek care at their hospital if they were infected with HIV. We know that caregivers are often reluctant to seek counseling or treatment at the hospitals where they work, choosing instead to travel to a different hospital or to forego treatment altogether. Respondents were asked "If you had HIV, would you prefer to be treated at the hospital where you work or would you prefer another hospital?" In intervention sites at baseline, 62 percent said they would prefer to be treated at the hospital where they work, but

this increased to 69 percent at follow-up ($p = 0.017$). There was less change in the comparison sites (60 to 63 percent; $p = 0.179$; Table 3).

Table 3 also shows that exposure to the program influenced where employees preferred to be treated. Seventy-seven percent of those who participated said they would prefer to be treated where they work, compared to 75 percent of those who were aware but did not participate, and 56 percent of those who were unaware ($p < 0.001$). Multivariate analysis confirms this relationship, indicating that those who participated in the intervention were 1.7 times more likely than their unaware counterparts to say that they would prefer to be treated at their index hospital (AOR1.7, CI: 1.0–2.8; Table 4).

Another way of assessing social capital is the degree of openness about HIV, for example willingness to confide in others. In the intervention sites, the percent of employees who said that someone at work had confided in them about their HIV-positive status increased from 19 percent at baseline to 35 percent at follow-up ($p < 0.001$). However, a similar increase was observed in the comparison sites. When examined by exposure, half of participants (52 percent) indicated at follow-up that a colleague had confided in them about their status compared to 29 percent of those who heard but did not participate, and 28 percent of those who had never heard of the program ($p < 0.001$; Table 3). As a peer educator observed:

> *The entire program brought us together, we lived as a family. So we found it very very enjoyable. It brought people together interacting together, sharing ideas together, so on.*

HIV burden among hospital staff

The study suggests that hospital workers are affected by HIV in their personal capacities within their families. At baseline, 38 percent of intervention site respondents and 40 percent at comparison sites stated that someone in their immediate family had HIV or had died of the disease. During the follow-up, these figures rose to 51 and 48 percent, respectively ($p = 0.001$ for both groups). This increase may be linked to a higher disease burden in the country in general, or a greater degree of comfort in discussing HIV/AIDS issues among hospital employees and the public in general. The family members of caregivers may also see them as a safe and confidential resource for obtaining care, and may disclose their status to them.

Multiple Partners and Condom Use

Caring for Caregivers encouraged the employees to take preventive measures against HIV, including abstinence, being faithful, and using condoms. Because of the diverse nature of the hospital setting, and because almost half the hospital staff were unmarried, it was anticipated that such a message would resonate differently with different cadres. To assess the impact of the intervention, several questions pertaining to sexual behavior were asked. When asked whether they had been sexually active in the prior 12 months, 72 percent of those in the intervention sites and 74 percent in the comparison sites said they had. [3] These respondents were also asked how many different people they had had sex with in the 12 months prior to the survey, and those reporting more than one person were classified as having multiple partners. In the intervention sites, the percent with multiple partners decreased from 27 percent to 14 percent ($p < 0.001$). However, the proportion remained largely the same at the comparison sites (21 percent vs. 22 percent ($p = 0.538$). There was a curvilinear

[3] Figures exclude 4 percent (n = 30) of intervention and 2 percent (n=14) of comparison respondents who declined to answer the question.

relationship between exposure to the intervention and having multiple partners: 11 percent of those exposed to the intervention reported having multiple partners, compared to 19 percent of those aware but did not attend and 12 percent of those unaware, although this association was not statistically significant (Table 3). Since this association violated the assumptions of logistic regression, this procedure was not done.

For those with multiple sexual partners, condom use is an important risk-reducing behavior. Therefore respondents were asked whether they had used a condom at all in the 12 months preceding the survey. Among intervention site hospital staff with more than one partner in the past 12 months, condom use increased from 57 to 75 percent ($p = 0.016$). However, at comparison sites this figure remained constant at 71 percent ($p = 0.983$). All the same, this means that as much as a third of respondents who had multiple partners had not used a condom at all in the preceding year, placing them at risk for HIV. The number of respondents ($n = 63$) was too small for regression analysis and this procedure was not done.

HIV Testing

Where to get tested

Caregivers were asked if they knew where to get an HIV test in their hospital. As expected in a hospital setting, the percentage who said "yes" were high, and increased from baseline to follow-up from 87 percent to 96 percent at intervention sites ($p < 0.001$), and from 90 percent to 94 percent at comparison sites ($p = 0.001$).

HIV testing among hospital personnel

Assured that they were not required to disclose their HIV status, respondents were asked if they had ever been tested for HIV. There were increases in the proportions tested across the groups, especially among those participating in the intervention. At intervention sites respondents reporting ever being tested for HIV increased from 25 percent to 40 percent ($p < 0.001$) and at comparison sites increased from 31 percent to 40 percent ($p < 0.001$). However, when examined by exposure, 49 percent of participants had been tested, compared to 38 percent who were aware but did not attend, and 37 percent who were not aware of the intervention ($p = 0.035$). Multivariate analysis shows that the link with participation in the Caring for the Caregiver project remains significant when controlling for other variables, but only if one participated: participants were 1.7 times as likely to say they had been tested for HIV (CI: 1.09–2.59), while those who were aware but did not attend were no more likely to have been tested than those who were not aware of the intervention (AOR 1.12, CI: 0.77–1.64; see Table 4).

One of the hospital managers interviewed stated that Caring for Caregivers encouraged him/her to go for HIV testing:

Respondent: *The intervention was helpful because it helped me know my status. I went for testing, though I was scared.*
Moderator: *Why were you scared?*
Respondent: *You know when going for your results, whether you are ready or not, there is always that fear.*

While the intervention was associated with a greater likelihood of HIV testing, it is worth noting that more than half of participants still had not been tested. Indeed 51 percent of those who were exposed to the intervention had not been tested, compared to 62 percent of their counterparts who were aware of the intervention but did not participate, and 63 percent of those unaware of it. In the follow-up survey among intervention site respondents, 35 percent of doctors, 51 percent of nurses, 51 percent of the paramedics, 50 percent of the clinical officers, 54 percent of administrative staff, 70 percent of CDEs and 71 percent of students had never been tested for HIV. Similar findings were documented in the comparison site follow-up survey respondents. It is also noted that increases in testing also occurred in the comparison site, and at similar magnitude. This may be due to the increased HIV awareness that has resulted from the ARV roll-out in Zambian health facilities.

Reason for not having tested

The main reasons for not getting tested remained mostly the same from baseline to follow-up at intervention and comparison sites. Primarily, caregivers indicated ‘no particular reason/don’t know why (39 percent at follow-up) and that they did not feel at risk (30 percent) and a fear of the results (15 percent) as the main reasons for not testing.

HIV testing among partners

Respondents were asked whether their current sexual partner had been tested for HIV and the data suggest an increase from the baseline: the percent of caregivers who said that their partner had been tested increased from 19 percent to 40 percent at intervention sites ($p < 0.001$) and from 21 percent to 32 percent at comparison sites ($p = 0.001$). Due to its pilot nature, the intervention did not address couple testing during this stage, and the data show there was no relationship found between partner testing and exposure level (41 percent among participants, 36 percent among aware but not attend, and 40 percent among unaware, $p = 0.86$). All the same, the results show that 60 percent of the intervention site respondents and 68 percent of their counterparts in the comparison sites do not know the HIV status of their partners.

Discussion and Conclusions

The objective of the Caring for Caregivers initiative was to develop and test a risk-reduction workplace program for hospital staff. This was motivated by the recognition that hospital workers are often overlooked in HIV programming, and yet many are infected or affected by HIV. It was also motivated by the fact that hospital staff are heterogeneous, with both clinical and non-clinical staff having varying levels of understanding regarding HIV transmission. As such, we felt a hospital-based intervention aimed at educating, counseling, and supporting hospital employees from all strata could be beneficial.

Caring for Caregivers was a peer education program targeted at hospital staff and implemented in two hospitals in Zambia, with a combined staff of about 1,700 employees. It was conducted by 79 trained peer educators using an audience-driven manual. Peer education activities started in August 2004 following a baseline survey conducted in January 2004; and a follow-up survey was conducted in February 2006. Once launched however, the interventions encountered severe challenges, and it was only implemented with sufficient intensity during the first six months. The main reason was a dramatic change in the funding environment, leading to sharp financial cutbacks for operations research. In addition, a reorganization of Zambia's HIV/AIDS strategy was under way, involving the entry of new implementing agencies with new priorities. While the study team had anticipated some of these obstacles, the transition to the new environment led to considerable disruptions. It also affected the timely implementation of the follow-up survey, and fieldwork was conducted almost 14 months behind schedule. Still, the ZMA forged ahead and achieved some tangible results as discussed below.

Discussion

Those who participated in the intervention would recommend it continue.

About a quarter of the hospital staff said they had participated in the intervention, and virtually all who took part said it should be continued. Over 80 percent reported taking specific action as a result of the exposure, for example discussing with partners and family members about HIV, using condoms, and getting tested. Although participation was lower than hoped for**,** this may be a reflection of the realities of hospitals as sites for a workplace HIV program. With the chronic personnel shortages in Zambian hospitals, staff turnover and challenging hours, many employees could not find time to participate in intervention activities. As with voluntary peer education activities, self-selection may affect the results of an intervention (i.e., it is possible that those most likely to change, or those with unique interests, are the ones that participate in such programs). Analysis showed that clinical personnel such as nurses were less likely to attend the sessions, while administrative personnel were more likely to participate. Future programs should consider the high-intensity nature of hospitals, and make programs more attractive to clinical staff. For example, programs that could offer refreshments and coincide with breaks may attract harried health care workers. Interventions that can build flexibility in implementation may have the greatest reach.

The intervention was associated with several positive outcomes.

Regression analysis showed strong dose-response associations between the intervention and many beneficial outcomes, including higher HIV knowledge, lower stigma, and greater awareness of PEP. Indeed many employees, including some in management, learned about PEP for the first time as a

result of the project. In one of the intervention sites, the staff formulated guidelines on PEP, and the other intervention site sought these guidelines to adapt and apply themselves. Caring for Caregivers was also associated with greater equalizing of information— whereas PEP was largely known by medical doctors, this changed during the follow-up as more of the other cadres learned about it. However, non-clinical cadres such as support and custodial staff and administrative personnel remained uninformed of this life-saving measure. For example, only 10 percent of custodial staff were aware of PEP after the intervention. Custodial staff may be a particular concern as many work directly with infected fluids, often without proper sanitation and protective equipment. Therefore, interventions to reach these individuals are greatly needed. Moreover, the relevance of PEP is not limited to occupational exposure; PEP is used to prevent infection in other HIV exposures, for example from sexual assault, or in case of accidental contact with infected materials such as from road accidents. Therefore all hospital staff should be availed this information and informed of the proper use of PEP.

The project was associated with increased employee empowerment and social support.

Regression analysis showed that the intervention was associated with increased perceptions that employees could influence how their hospitals handle HIV/AIDS issues and improvements in social capital. As many staff members commented, the program brought them together to face a common "enemy." This was all the more important when examined in light of the fact that half the respondents in the follow-up survey reported that they had had a family member die of HIV or was currently infected. Discussions with health care workers revealed that many are apprehensive about sharing their own HIV situations with colleagues lest this raise unwelcome inquiry. Study participants also commented that infected medical personnel are seen as failures in the community. And because health care workers are familiar with the signs and symptoms of HIV, many are afraid of the continuous scrutiny they would attract from colleagues. Therefore, strengthening their collective self-efficacy was an important outcome.

Access to condoms increased over the study period.

A major problem in many hospitals is lack of open but discrete access to condoms. In Zambian health care facilities, condoms are usually stored in designated locations and only those authorized can access them. This means that many nonclinical personnel cannot access condoms at their workplace, and are forced to buy them, seek free ones elsewhere or do without. Moreover, even clinical personnel would have only limited access, since one can only obtain so many condoms at a time without attracting comment. Caring for Caregivers was implemented with the premise that the hospital is a workplace and like other workplaces in Zambia, condoms should be made easily available to employees. This strategy was highly successful and removed the social and cost barriers associated with condom access at work.

There was a reduction in reported HIV risk behaviors among employees in the intervention sites.

While the sample sizes were too small to conduct extensive regression analysis on condom use, the results indicate that there was a decrease in reported sexual risk-taking in the intervention sites with no change in the comparison sites. Because most respondents in the study were unaware of their own or their partner's HIV status, general reductions in risk behaviors are welcome project outcomes.

HIV testing rates remain low.

The data show that while those exposed to the intervention were 70 percent more likely to have been tested for HIV, overall testing rates were low. We believe that focusing attention on HIV testing programs for this population will result in large dividends in terms of decreasing risky behaviors and channeling those who test positive to appropriate care programs. One such program that has not been adequately evaluated is the provision of test kits for self testing of health care workers. The fact that many hospitals have teaching colleges means that these initiatives can be extended to the students. The problem of lack of awareness of partner's serostatus also cuts across all groups, indicating the urgency of couple HIV counseling and testing initiatives for hospital staff.

A guaranteed level of resources is necessary to achieve sufficient program intensity.

The study documented a number of positive findings despite a relatively low level of participation. Therefore, it is likely that greater and more concerted efforts could yield better results. For example, the finding that participation in the intervention was associated with a nearly six-fold increase in PEP awareness, nearly triple the proportion of respondents reporting high HIV knowledge, and a nearly quadruple likelihood of knowing where to get female condoms means that greater efforts could translate into greater payoff. It is particularly important in the context of HIV serostatus awareness: the finding that the intervention was associated with a 70 percent increase in the likelihood of being tested for HIV suggests that a more intensive effort may result in even larger gains. Therefore similar programs should be implemented with sufficient intensity and support to maximize their benefits. The financial challenges experienced during Caring for Caregivers hampered crucial activities such as retraining of peer educators, and the ability to provide them with sustained and supportive supervision. It also limited available educational materials, making it difficult to respond adequately to emerging issues and topics. Although hospitals offered some support, the financial challenges limited the intensity with which the project could be implemented.

Support of management was key.

The support of hospital management was key to the success of the intervention. In both hospitals, the executive directors saw the importance of the intervention and supported it by attending meetings, actively encouraging hospital workers to participate, and allowing staff time to meet. However, the intervention would have needed to be budgeted for at the inception of the financial year. Hospitals aspiring to undertake a similar activity shoukd consider allocating an appropriate budgetary figure to pay for relevant expenses such as BCC materials. We are currently working with study hospitals to ensure continued availability of project materials and activities.

Use of peer educators and development of departmental work plans was effective.

The fact that the interventions' effects were still detectable despite a 14-month delay in the follow-up survey suggests that it had lingering effects. This is largely because of the strategy utilized, i.e. peer education. Once trained, peer educators innovatively continued their work. The fact that the program was implemented within each department also meant that various Caring for the Caregiver activities were going on in different parts of the hospital as driven by each department. Because each peer educator was assigned 10–15 hospital workers, it meant that s/he could focus on a small group of individuals. Departmental work plans and strategies were developed and each department implemented its own activities. This broke down the tasks and made the project responsive to its staff.

A similar strategy may be appropriate in other hospitals, and may be a better option than one-off large all-staff meetings.

The Caring for the Caregiver Project did not pay the peer educators, instead it awarded them non-monetary recognition. Hospitals aspiring to undertake such an intervention may benefit from developing adequate but non-monetary recognition for peer educators and others who support the program. Items such as t-shirts, public acknowledgement, training and similar recognition can greatly motivate peer educators, and may circumvent highly-monetized challenges.

Branding of the program is recommended.

Efforts to implement an intervention such as this in the future would benefit from clear branding of the program. The present intervention was called Caring for the Caregiver, a name that made it easy for hospital staff to relate to, and captured the spirit of the intervention. Program branding also allowed employees to rally around a common understanding of their mission. It also facilitated the evaluation, as respondents were asked about the specific intervention by name, and could therefore quickly identify it.

Peer support groups were important.

Caring for the Caregiver also encouraged the formation of peer support groups and each was left to organize itself. This allowed flexibility, with some groups engaging in innovative income generation activities, such as providing male circumcision. Earnings were used to help ailing colleagues. If possible, future groups could be judiciously availed seed money or other resources to facilitate their activities, for example mounting special events for World AIDS Day.

Supportive program monitoring was essential.

Caring for the Caregiver was implemented by the Zambia Medical Association, who saw the wisdom of establishing a project monitor. This individual travelled to the hospitals to provide supportive supervision and to supply materials. As a hospital employee commented, it was “good to have someone come and check on us”. Future activities should strongly consider a dedicated project monitor.

The hospital can offer appropriate flexibility for information dissemination.

Hospitals have many other unique options that can supplement workplace programs. For example, HIV prevention could be incorporated into Continuing Medical Education activities or Grand Rounds. Because developments in HIV are happening all the time, information about emerging topics such as male circumcision, early infant diagnosis, pediatric HIV, HIV discordance, and prevention with positives may be readily disseminated through these mechanisms. In addition, because of the dynamic workforce associated with a hospital, a mechanism to orient new staff would be needed—the fact that nearly 40 percent of the sample had not heard of the intervention underscores the importance of effective and continuous marketing of these programs to ensure that the intended target groups are reached and enrolled.

Comprehensive care staff clinics are greatly needed.

During discussions with hospital personnel, many commented that they have to obtain care much the same way as the general public does. For many health care workers, this presents considerable discomfort, as it is possible that clinic patients may recognize a health worker. In addition, a visit to a hospital may end up with the health worker being examined and treated by a colleague, a particularly sensitive problem where HIV is involved. Many health care workers therefore prefer to seek care far away from the hospital, incurring considerable financial and time costs. This problem came to the fore when Caring for Caregivers was implementing counseling and testing activities, and nurses realized there was no designated place where they could receive HIV counseling in private. While hospital management was responsive and eventually availed an appropriate room, this problem highlighted the dilemma health care workers have in seeking personal care. Staff clinics that provide comprehensive medical care for hospital staff can alleviate this problem, and minimize the social, financial, and time costs associated with care-seeking options for this population. While this may not solve the problem of being treated by a colleague, it would remove some of the hurdles now faced.

Basing the intervention on behavioral theory facilitated the research and the intervention.

The project was based on three human behavior theories. It was also based on a hospital-centered conceptual framework, a process that allowed more focused intervention. Materials addressing various aspects of behavioral theory, such as solidarity and social capital, were integrated into the intervention. In addition, behavioral theory guided the design of the data collection tools, allowing appropriate assessment of the various outcomes. Future programs may find the utilization of behavioral theory and conceptual models helpful in the planning, implementation and intervention of their activities.

Conclusions

Caring for Caregivers may be the first documented HIV/AIDS workplace program for hospital staff in sub-Saharan Africa, and provides experience that could benefit other hospitals addressing a similar audience. Although the program ended in Zambia, there are plans to borrow elements of the intervention for hospital workers elsewhere. The project has also identified other overlooked populations in Zambia, for example medical students, nursing students, and others in medical or paramedical training, who could benefit from workplace programs. There is need to recognize that health care workers need the same interventions they provide to the public, and indeed “charity begins at home.” HIV prevention, treatment, and care strategies should involve health care workers not just as a means to reach the community, but as direct and priority beneficiaries as well.

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