

TRAINING INTERVENTION STUDIES AS FOUND IN THE LITERATURE ADDRESSING VARIOUS TYPES OF OCCUPATIONAL HAZARDS

A-V. Control of Health Hazards—Biologic Agents						
Work Setting Operation (Ref)	Training Objective	Training Plan	Evaluation Method	Extra-Training Factors	Results	Comments
700 health care workers, particularly those engaged in non-direct hospital inpatient services (e.g., house-keepers, dietary workers, laundry workers, nurse's aides) whose workplace risks include exposures to HIV and other infectious agents. (Askari & Mehring, 1992)	Via a union-supported train-the-trainer program, to 1) enhance worker knowledge of occupational risks from exposures to blood/body fluids at the worksite, 2) develop strategies to reduce the risks, 3) discuss feelings about caring for HIV/AIDS patients, and 4) hold workshops for covering the above on return to one's worksite.	Main features were 1) a train-the-trainer approach, 2) aimed at non-professionals not typically covered in HIV/AIDS instruction, and 3) an education for action method built on trainee experiences and concerns, and discussions of problem-solving ideas and how they can be effected through employee action. The 2-day sessions employed case studies, small group exercises, role-playing, audio-visuals and other means to promote worker involvement, and plans for follow-on workshops that they would hold. Subsequently, these 100 worker-trainers used similar techniques to lead AIDS/HIV workshops with 600 health care workers.	Pre and post tests were used to assess "trainers to be" knowledge of subject matter and merits of the program. Post-training competency was also tested in those workers attending workshops of the "trainers." Reports of the trainers summarized their experiences.	Assistance was given the worker-trainers when they went back to their workplaces by supplying videos and HIV/AIDS materials. However, efforts by worker-trainers to train others in their departments met resistance by supervisors who believed them unqualified.	Union trainer scores on knowledge of basic information on HIV/AIDS transmission and prevention increased from 80% pre- to 92% post-instruction. The overall quality of the program, its materials, and method of instruction was graded excellent. From workshops held by these trainers, attendees, post-test competency scores were 90%. Trainer reports of the workshops indicated that they had difficulty getting people away from work and needed more time to cover topics. The trainers believed they were ill-equipped to handle prejudices about people with AIDS/HIV that also surfaced.	Feedback to workshops indicated that hearing information from union trainers and co-workers had greater credibility than from the infection control officer. Still, gains in knowledge and positive reactions to programs do not ensure follow through in terms of behaviors and new work practices that can reduce the risk. Evaluation methods need strengthening.

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144 nurses (101 RNs, 43 LPNs) at two university-affiliated VA medical centers engaged in tasks involving exposure to blood/body fluids. (Goldrick, 1989)	To compare the effectiveness of a self-managed, programmed unit of instruction versus a lecture mode in educating nurses on principles of infection control regarding hepatitis B and HIV exposure risks.	Instructional material for programmed learning developed as series of frames arranged in heirarchical order on topics of the infection process, routes of transmission, risk factors, and types of precautions and applications. Similar information given in lecture. Nurses grouped into the two learning modes for making comparisons.	An identical 10-item forced-choice quiz was given during the pre- and post-test to measure knowledge gain from each type of learning mode. Time taken to cover material and preference for instruction also noted. Years of experience and education assessed with regard to influence on the results.	None elaborated.	Both modes showed significantly better post-test scores, but those for the programmed learning group were higher than those in the lecture group, regardless of educational level or experience. The programmed learners also took half as much time to complete the material and showed a preference for this method of inservice training. Years of nursing experience varied inversely with the perceived complexity of the programmed material.	The question remains of how much of this training effect is translated into control actions. How durable is the knowledge gain from either form of instruction?

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3100 employees in a university hospital who were subject to three intervention efforts for reducing needle-stick injuries as part of an infection control program. Education was one such effort (Linnemann, Cannon, DeRonde, & Lanphear,1991)	To stop recapping of needles and their improper disposal as a means of reducing the incidence of needle-stick injuries; also to enhance the reporting of all such injuries for follow-up laboratory testing for hepatitis and HIV.	Infection control department furnished information to all nursing personnel and new hospital workers on risks of needle-stick injuries and bloodborne infections and on ways to decrease the risk. Among other behavioral actions, avoiding recapping was stressed. Needs for reporting such events also stressed in light of health risks. Educational effort later augmented by placing sharps containers in each patient room and instituting universal precautions that reinforced the dangers of needle-stick injuries and prevention.	Hospital maintained a surveillance system for tracking needle-stick injuries by employee groups and had the system in place before, during, and after the education intervention. Such injuries also noted after placing sharps disposal units in patient rooms, and after introducing universal precautions practices. Those reporting injuries also completed questionnaires as to the circumstances (i.e., while recapping, needle in trash, linen, etc).	None noted.	Pre and post differences in needle-stick injuries just after the education effort showed a rise in cases (51 per 1000 vs. 67 per 1000 employees) believed due to increased reporting. The injury rate (50 per 1000) decreased when sharps containers were installed and remained at that level for the universal precautions. Nurses were most afflicted group; their needle-sticks from recapping did not drop below 15% despite three intervention efforts.	Authors provide little detail as to the nature of the education program used. They do note that more direct monitoring of workers recapping practices may be a means for reinforcing the instruction. Mention is made of providing direct feedback to managers in areas where injuries have occurred to encourage their participation in the prevention process.

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964 employees of a medical center including clinical staff, laboratory technicians, and housekeepers taking part in a program aimed at generic infection control (Lynch, Cummings, Roberts, Herriott, Yates, & Stamm, 1990)	To enhance employee knowledge of infection control and adoption of more stringent barrier practices (i.e., use of gloves/masks/gowns) and compliance with upgraded containment/disposal measures as part of a program aimed at body substance isolation.	Practices of various departments revised to conform with new, explicit recommendations. Preliminary discussions held to resolve potential difficulties. 50 training sessions run, each a 45-minute slide and discussion offering. Attendance varied among the various staff groups; at end of training, about 75% of clinical staff attended and 51% of workers in other categories.	Evaluation used a pre and post training approach and included 3 measures: 1) written test just before and after the training to ascertain infection control knowledge, attitudes and self-reports of work practices; 2) direct observation of compliance with recommendations for glove use; and 3) monitoring the colonization and infection of hospitalized patients with marker organisms.	Total program of body substance isolation had support of medical staff leadership and hospital administration. Importance seen in that compliance with the new procedures was made part of an employee's performance review in some departments and later adopted by others. Barrier practices required added supplies (glove boxes, disposal containers), which were obtained.	1) Scores on the questionnaire indicated statistically significant increases in knowledge. Staff responses also showed over 90% knew of prescribed glove use for infection control before the training, but less than 75% admitted conformance. 2) Proper glove use, judged by direct observations for 2 months before and 3 months post training, found overall improvement of 20%; for some groups the gain was 50%. 3) Markers for nosocomial colonization and infection in clinical specimens showed a sharply declining rate for 3 post-training years.	Authors note that involving key personnel early in the decision-making and training process was critical in gaining acceptance of the total program. Mention made of role of head nurse as instrumental to the success of the program.

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759 California health care providers given teaching instructions and learning about AIDS; they in turn taught 18,879 other health care workers on the same topic. (McCarthy, Schietinger, & Fitzhugh, 1988)	To increase health care providers knowledge about HIV infection, allay unwarranted fears about AIDS, provide innovative ways to instruct others in understanding and controlling this disease, and to enable health care persons to become AIDS education resource persons in their own communities.	Train-the-trainer approach used adult education concepts (stress self-direction, experiential reference, task-centered techniques) in a 2-day program covering 8 topics (e.g., attitudinal factors in teaching/learning, HIV infection, transmission and control, adult learning principles). 27 sessions of 30–35 participants were held. Attendees later gave 1–3 hours of AIDS education to health care workers in their communities.	20-item written test at the end of the 2-day program for the trainers to assess their knowledge of adult education and HIV infection. Those in the follow-on HIV education programs took a written post-test containing 14 true/false questions on HIV transmission, prevention, and screening. In addition, qualitative reviews offered by a minority AIDS task force on course relevancy. A research agency polled trainers on adequacy of preparation.	None elaborated.	Trainers scores on the post-test found 88% achieving a rating of 90% or higher. For those attending the HIV education sessions of the trainers, 73% achieved 90% or higher scores on one version of the true/false post-test; and 92% scored above 90% on a revised version. Qualitative review indicated needs for using case studies involving minority members to make material more relevant to user groups. Trainers felt capable as AIDS instructors; main problem was gaining release time for workers to attend classes.	Study concept was excellent in terms of learning approaches and train-the-trainer means for delivering the instruction to a needy audience in a short time period. The evaluation plan seems the major limitation to the study, i.e., no pre-test or control group to compare with post-test scores for knowledge gain or other indicators to show the effect.

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208 nurses in a 135-bed hospital on the occasion of introducing new sharps boxes and a policy to discontinue needle recapping. (Seto, Ching, Chu, & Fielding, 1990)	To have nurses forgo recapping of needles and therein reduce the incidence of needle-stick injury and risk of blood-borne disease transmission.	Three methods compared to inform/encourage nurses to adopt a new needle disposal policy. Method #1: policy communicated via charge nurses of wards; Method #2: charge nurse announcement plus posters and pamphlets given each nurse in ward; Method #3: same as Method #2 but also half-hour in-service talks on pamphlet by infection control officer.	9 wards randomly selected/divided into 3 groups, each subjected to one of the three methods. Before new disposal policy introduced, each nurse asked about their needle recapping practices, the merit of using sharps boxes for disposal, recapping risk, and safest needle disposal practice. 5 weeks after policy announcement, this inquiry was repeated. 1 day before repeat inquiry, sharps boxes used in a 24-hour period collected unannounced in wards, and number of uncapped/recapped needles counted.	None elaborated.	Post policy comparisons found 85% of nurses from Method #3 wards to report no recapping, followed by 66% from Method #2 wards, and 27% from Method #1 wards. This order correlated with 57%, 47%, and 26% of the needles found in the sharps boxes that were found uncapped for nurses in Methods #3, #2, and #1 wards, respectively. Self-reported behavior changes were greatest for those nurses scoring highest on the concept questions after the policy announcement.	Authors suggest that educational efforts that ensure appreciation of concepts prepare the way for associated behavior change. Presumably, Method #3 provided for that experience, which is referred to as more active in nature. Short follow-up period (5 weeks) and a single time point for evaluation raises question about the durability of the findings.

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1,247 health care providers (mostly nurses but lab technicians and hospital support staff also included) whose jobs could include administering to AIDs cases. (Wertz, Sorenson, Liebling, Kessler, & Heeren, 1987)	To educate providers in ways to protect themselves from getting AIDS in the course of their jobs, to feel comfortable in caring for AIDS patients, and to discharge the highest quality services.	90-minute sessions held at 36 sites in Massachussetts. Lecture/discussion format addressed epidemiology of AIDS, modes of transmission and prevention, general infection control procedures, and psychosocial concerns. Added feature was either a physician talk on latest AIDS research or an AIDS-infected patient describing illness.	Questionnaire used before session, immediately after session, and 1 month later to obtain data on trainees knowledge of AIDS transmission and means for control and on attitudes and competency in treating AIDS patients.	None elaborated.	Post-session data showed knowledge gains in 7 of 15 modes of transmission and 7 of 11 means of infection control; sizeable percentages still held mistaken beliefs about contacting AIDS. Post-session attitude shifts were toward more comfort and ability to handle AIDS cases. Sub-analyses found those who established regulations for care of patients and out-patient/providers to have more accurate knowledge and assurance in handling AIDS cases; the inpatient providers, the least. 1-month follow-up revealed no change.	Results suggested needs for further education of health care providers as a group and different instruction for those at different levels. Educational offering was able to shift attitudes in positive direction, but this approach was not able to eliminate all differences between the subgroups of providers.

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277 physicians in two hospitals whose job routines include exposure to patient blood and body fluids. (Wong, Stotka, Chinchilli, Williams, Stuart, & Markowitz, 1991)	To promote compliance with policies on use of universal precautions as prescribed by CDC and mandated by OSHA.	Slide/lecture sessions (up to 1 hour in length) held on etiology of HIV and hepatitis B, transmission modes, and risk of infection. Barrier devices, waste disposal, use of cleaning agents, and reporting of needle-stick injuries explained. Added education through grand rounds, conferences.	Physicians completed forms describing each incident of potential or actual contact with a patient's body fluids. Use of protective devices (gloves, gowns, masks) noted and whether they had averted direct contact with the fluid. Forms filled out daily, and entries compared for 3–4 months before and after the training period.	Barrier devices were stocked in a central location in each ward and restocked daily. Each patient room supplied with a box of examination gloves and puncture-proof box for sharps disposal. Signs on universal precaution policies mounted at the central nurses station. Follow-up memo in one hospital on precautions.	Barrier use during fluid exposure incidents increased from 54% before implementation to 73% afterwards. Rates of direct exposure contacts decreased by 52%; and use of barriers was found to avert direct contact events at a rate 50% greater than before. The rate of needle-stick injuries also dropped by 62%.	Results impressive but based on physician self-reports, not on direct observations. Data identify procedures where exposure/contacts are problematic and need study to reduce risk. Authors indicate that gloves were main factor in efficacy of the precautions, and increased access to barrier devices were also a key to success of the implementation.