Research Team Training: Moving Beyond the Job Descriptions

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As domestic and international health issues increase in scope and complexity, the need for research into ways to address these issues also grows. An essential component of a successful research project is a well-trained research team. Team members need training in basic job-related research skills as well as specialized training relevant to the unique clinical, theoretical, and social complexities of the research being conducted. While its importance is not often emphasized in the research literature, training has serious implications. Providing inadequate or ineffective initial training can result in unbudgeted remedial training costs. Non-standardized training can also lead to disorder and discrepancies in how the research protocols are followed and can ultimately impact the integrity of the intervention. These situations are certain to delay the progress of a research project, which may jeopardize time-limited funding. This article describes the essential processes and components of a research team training program, using examples from a training program developed for research staff implementing a multi-site randomized controlled intervention trial.

Study Overview

The sample study is an ongoing multi-site randomized controlled trial of an HIV prevention intervention with 600 adolescent girls recruited from community-based health care sites that offer reproductive services. Girls ages 15–19 are approached by trained personnel who explain the research study in detail and seek informed consent. Participating girls are randomized to either a gender-specific HIV risk-reduction condition (intervention) or a health promotion condition (control) and complete a pre-intervention survey using audio computer assisted self-interview (ACASI) software. Each condition consists of four weekly 2-hour sessions with booster sessions at 3-months and 6-months post-intervention. Survey data are collected at 1-week, and 3-, 6-, and 12-months post-intervention using ACASI. Urine specimens are collected for gonorrhea and Chlamydia testing at baseline and 6- and 12-month post-intervention.

In addition to the principal investigator (PI) and two co-investigators who are responsible for the overall conduct of the study, the team includes other personnel with various roles. The project director, with support from the assistant project director, handles the daily operation of

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the project, including personnel management. Twelve group facilitators run several intervention and control groups each week at three community sites; each group is conducted by two female facilitators. A tracking coordinator contacts participants to ensure their attendance at the group sessions and their retention throughout the year they are enrolled in the study. Four recruiters market the project to potential participants and obtain informed consent from interested girls; they also collect survey data and urine specimens. The study involves many university students (doctoral, master's and bachelor's levels) as well as other paid employees.

Identification of Training Needs

Training challenges were identified primarily through two methods. First, a critical review of individual job descriptions was conducted to determine if and how certain job functions overlapped in order to streamline training and identify opportunities for cross-training. General training needs were identified after a detailed review of the job responsibilities and duties of research staff. Specific implementation training needs were identified through a review of the project's research program curricula, intervention manuals and research protocols that the staff are expected to follow. Second, a small number of staff was initially hired and trained so that they could become team leaders to the larger number of staff that would be subsequently hired. Before hiring subsequent waves of research team members' feedback was elicited and received from these initial hires about the training they had received in preparation for their roles in the research project. Research team members gave specific recommendations on what training content they believed would have better prepared them for their roles and what methods would have better facilitated their learning.

Based on the comprehensive reviews and feedback, actual and potential needs as well as challenges to effective and efficient training were identified and subsequent decisions were made on the training content and process. Focusing on major training challenges (out of the many topics identified) was critical because the time and funds for training and the availability of staff were all limited. Nearly all team members were newly hired and thus needed to be trained almost simultaneously in order to be ready for the project launch date. Furthermore, staff effort varied from those employed full time on the project to those with other jobs who worked part-time or time-as-reported on the project. Nonetheless, staff still needed to be trained on the same content and at the same time to ensure consistency. With these constraints in mind, the best available evidence was reviewed to help identify essential training components needed to implement the research project (training content) and the most effective and efficient ways to deliver these essential training components to the research staff (training process).

Training Content

University, Professional, and Community Site Training

As in most research projects, our team members were also employees of a larger entity—the university. The university has its own training that team members need as part of their employment, including orientation to the university and its policies (e.g., mission, vision, values, security, emergency response plan, employee benefits). It is important to anticipate this type of training for new employees since it is paid for with research funds and could last several days.

Beyond university orientation, other professional orientation training needs were discovered during the project. For example, while team members were allowed to address personal issues during scheduled breaks and lunch time, there was no clear guidance on how much time should be allotted for such activities, and some people extended their half-hour lunch break to >2 hours. Additionally, while their roles required them to have access to the internet, some features

of the internet were found to be distracting to project staff and interrupted workflow and productivity.

In response to these issues, professional and workplace conduct guidelines were developed. Policy specifications were made that internet resources must be limited to work-related usage (e.g., limiting instant messaging and other pop-up programs), and that all non-emergency personal issues that could impact the scheduled work plan must receive prior approval from the project director. These guidelines were implemented to preserve team member productivity, maintain cost-efficiency, further develop the professionalism of our team members, and protect the progress of the project. These guidelines were met with very positive reactions by the research team who perceived them as measures to promote success of the research project and not as punitive actions. Existing macro-level quality assurance systems were also utilized to ensure research team productivity. For example, the university information technology (IT) department monitors and filters internet usage to identify usage that is outside the scope of employment duties (e.g., porn sites, music downloads). Routine updates of computer equipment by the IT department also provided us with details regarding office computers that contained non-work related software.

Community sites may also require formal or informal orientation of all research staff who will be working at their site locations. It is important to note that additional training time for the orientation of new research staff often time results in additional budgetary costs. Community site orientation is necessary to avoid conflicts (i.e., organizational culture clashes) and to ensure congruence between the research project and the site. At times it was also necessary for community and clinical site personnel to receive research orientation and research specific training. Trainings for clinical and community site personnel were arranged through a cooperative agreement with the site administrators and the principal investigator. The research team provided no-cost training (including lunch) to personnel from community and clinical sites. Community and clinical site employees' time was paid for by their employers (from subcontract funds) and not through direct research funds.

Research-Specific Training

Although little evidence was found on research team training in the nursing literature, there are indeed training needs beyond those generally listed in the job description that are important to the success of research projects. For example, the PI felt strongly that human subject protections, including team members' responsibilities related to the Health Insurance Portability and Accountability Act (HIPAA), should be highlighted as major training topics. The highest priority training for any research staff must be on ethical considerations and implications for human participants. This training must be completed and competency achieved before a team member begins any substantive involvement in the research project.

There is evidence in the literature that human immunodeficiency virus (HIV) prevention interventions with sound theoretical frameworks are more effective in changing behavior than those that lack sound theoretical bases (Albarracin, Gillette, Earl, Glasman, Durantini, & Ho, 2005). A recent review of similar intervention research with adolescent girls (Morrison-Beedy & Nelson, 2004) provided strong evidence that the most effective interventions contained behavioral skills, information and motivational enhancement components. It was decided that project staff would receive specific training on this model and on how it is used to guide the intervention study. All staff were given information regarding HIV and sexually transmitted diseases: including the sexual transmission of HIV, measures to prevent the sexual transmission of HIV, and the connection between the presence of a sexually transmitted infection and the acquisition of HIV. Staff directly involved in intervention delivery (i.e., facilitators) also received training on HIV-prevention behavioral skills (e.g., condom use negotiation, male and

female condom application, and assertiveness) and motivational enhancement methods for behavior change (e.g., motivational interviewing).

Additionally, research with adolescent girls includes two separate and related dimensions that require training. First, the literature provides strong evidence that awareness of and sensitivity to adolescent development and gender are important factors for successful programs to change adolescent risk behaviors (Wingood & DiClemente, 2000). Similarly, research findings suggest that the interplay between race, social class and ethnic culture is an important factor to consider when working with adolescent girls from diverse backgrounds (e.g., poor rural youth, middle-class suburban youth, and poor urban youth). This evidence led to the addition of developmental, gender, and cultural competence and sensitivity topics to the research training agenda.

Training Process

Coordinating a training program for an entirely new research staff is a skillful balancing exercise. A literature review was conducted to find evidence of effective training methods. Six methods were identified: independent-, self-directed, group-didactic, group-interactive, simulation-based and supervisory-iteration training.

Individual Level Training Methods—Independent training involves the research team member's completing a training exercise in order to gain knowledge or skills, but doing so independently of other team members. This includes methods such as reading a textbook or watching an instructional video. This method is indicated for low complexity topics for which textbook information is readily available, and for which competency can easily be assessed. While there were initial concerns that this method might lead to procrastination and low competency achievement, evidence from education psychology research did not support these assumptions (Evensen & Hmelo, 2000; Wolters, 2003). A related training method is self-directed training. Self-directed training occurs when team members utilize additional information resources to expand their knowledge base on a given topic. This complementary training was recommended but not required. Resources for self-directed training included related websites, peer-reviewed articles, books, seminars, and videos. This training method is designed to satisfy intellectual curiosity and a desire for professional growth.

Group Level Training Methods—Group-didactic learning is analogous to "classroom style" teaching, in which a trainer provides explicit instruction via lecture format and then answers questions from the audience. This training is indicated for topics that are too complex for independent-training but for which little intra-group interaction is necessary (or desired). Although it tends to be the least preferred instruction method by both trainees and trainers, group-didactic is nonetheless effective (Smeeton, Williams, Hodges, & Ward, 2005). Group-interactive training involves team members actively engaged in organized intra-group discussion about the training subject content. Research suggests that the dialectical nature of interactive training not only challenges team members to think more critically about the training topic, but also serves an operational purpose by helping them learn to work as a team (Kayes, Kayes, & Kolb, 2005). This is particularly important with all new staff that needs to develop into a cohesive functional unit.

Simulation-based training provides a near "real world" experience for staff. Its value is that team members can confront planned errors or possible problems they may encounter in their roles and practice working through them in a supportive coaching environment. There is evidence that guided-error based training is effective, creative and associated with improved role self-efficacy and performance (Horng, Hong, ChanLin, Chang, & Chu, 2005; Lorenzet, Salas, & Tannenbaum, 2005). Last, supervisory-iteration training is a remedial method

implemented while team members are performing their roles. The need for this training can easily be identified through performance evaluations or "spot checks." Supervisors make scheduled and unscheduled field observations of staff in their various roles (e.g., recruitment, group facilitation) and provide feedback that includes the team member's strengths as well as strategies to improve areas of underperformance. The supervisor also develops performance objectives for the team member and continues to provide observation and feedback regularly until the desired performance is consistently observed.

Development of Individualized Training Plans

After reviewing the evidence on training content and the training process, the training program planning team recognized that while some content was relevant to every component of the project, other components were role-specific. The planning team then matched individual research team members with the appropriate training content and the appropriate training method. These matches are illustrated in Tables 2 and 3. Cross-training was provided to some team members in different roles in order to increase their functional capacity on the team, particularly if they might need to be called upon to perform tasks outside of their usual role. Additionally, training on certain topics was not necessary for some members who joined the team with considerable relevant professional experience. These topics were removed from their training plan since it would not add to the team member's existing knowledge base on the subject (Stanley, 2000) and would have negatively impacted the budget as well.

Developing and carrying out such an extensive training plan takes not only considerable time but also impacts the research budget. It is estimated that the training time needed to prepare for this project was between 200 and 250 total personnel hours. Such additional personnel hours should be considered when developing the initial study budget. Taking advantage of team personnel with expertise in specific areas by incorporating them as trainers rather than hiring consultants is one way to control training costs. For example, one research team member had experience teaching diversity training at another university and was able to provide similar training to the rest of the research team in a condensed one-day workshop. While the research team received expert diversity training, it did not carry additional costs for an outside trainer.

Outcomes

Several indicators were used to assess training effectiveness. These included reviews of periodic (3, 6, and 12-month) performance evaluations for new staff, intervention integrity ratings, and an open incident reporting policy. New team members are hired for a 3-month probationary period at the end of which they receive a performance evaluation. Participants are scored in numerous areas of training related job performance including, professional conduct, assurance of participant privacy, protection of human subjects, and role competence. High scores on performance reviews are used as indicators of training effectiveness and low performance score are used to indicate areas of less than optimal training. Performance review scores (3, 6, and 12-months) have consistently been high among research team members who were trained using the evidence-based approach. No formal training related corrective actions or terminations have had to be taken for any new staff hired since the evidence-based training program was put into place.

Training effectiveness is also evidenced through research team feedback obtained through a non-penalty based open incident reporting policy. Regularly scheduled team meetings are held where team members are encouraged to report incidents or other concerns encountered during the performance of their roles. Team members have reported several incidents which demonstrated that they received effective training in the protection of human subjects, HIPAA, and conflict resolution. For example, recruiters have reported that third parties (e.g., parents, friends) have requested the results of the STD screenings that participants receive at baseline.

Recruiters did not disclose this information and promptly reported the incident to the project director. The recruiters' attributed their actions to the HSPP, HIPAA, and situational problem solving training that they received.

Another indicator of training effectiveness is the quality of facilitation of intervention and control groups and intervention fidelity (adherence to motivational interviewing techniques and intervention curricula). All group sessions are audio-tape recorded. These recordings are then reviewed by a team of raters who use standardized forms to independently assess the facilitators' performance in the areas of intervention delivery and curriculum fidelity. Assessments indicated that facilitators are delivering the intervention in a high-quality manner (group facilitation skills training) and are adhering to the motivational interviewing techniques, using the techniques appropriately (motivational enhancement training), and adhering to the specialized intervention curriculum (curriculum training). The positive training related outcomes identified through these ongoing evaluative activities helps to maintain a high level of morale on the team and increases he teams' confidence in the training program and its potential for use in future research endeavors.

Conclusion and Implications

Essential topics relevant to successfully implementing a research program must include general standards for professional employee behavior as well as research-specific content, and need to be identified in advance. These topics should then be matched with the most appropriate and effective training strategies. Matching of training needs with appropriate content and effective strategies may help increase training effectiveness and efficiency and reduce training deficiencies. After implementation, the research team should be monitored so that any research or professional areas of underperformance can be quickly identified. Speedy remediation should be a priority for any group or individual area of underperformance. Training needs of research team members differ by role. Differences include training content and training method. Training also differs by context. In this intervention, for example, simulation-based training for group facilitators took place in university classrooms, in order to simulate the large, private room settings in which intervention groups took place; however, simulation-based training for recruiters occured at an identified site in the community, since actual recruitment occurred in a community context.

It is important that relevant training is provided up-front using a proactive (prevention) approach. Using a reactive (secondary) training approach by only responding to issues when they arise during the course of the research study may result in avoidable mistakes by team members, which may in turn, impede the operation of the project. Moreover, it is important to carefully estimate the cost of training. Researchers need to consider staff training time when constructing their research budget proposals. Without fully accounting for the training needs of project staff (beyond what is listed in the job description), researchers risk underestimating the time and money involved in training staff adequately.

Training is an important part of all types of research with their associated clinical, theoretical, and social complexities. Conducting complex research with vulnerable populations increases the need for high quality training on topics beyond what can generally be gleaned from reading a job description. Utilizing the best available evidence on a given research topic and on training methods can help researchers ensure that research team members are fully competent in the skills needed to implement the research program. This preparation will in turn directly contribute to the success of the research program.

References

Albarracin D, Gillette JC, Earl AN, Glasman LR, Durantini MR, Ho MH. A test of major assumptions about behavior change: A comprehensive look at the effects of passive and active HIV-prevention interventions since the beginning of the epidemic. Psychological Bulletin 2005;131:856–97. [PubMed: 16351327]

Evenson, DH.; Hmelo, CE. Problem-based learning: A research perspective on learning interactions. Lawrence Erlbaum Associates; Mawah, NJ: 2000.

Horng J, Hong J, ChanLin L, Chang S, Chu H. Creative teachers and creative teaching strategies. International Journal of Consumer Studies 2005;29:352–358.

Kayes AB, Kayes DC, Kolb DA. Experiential learning in teams. Simulation & Gaming 2005;36:330–354.

Lorenzet SJ, Salas E, Tannenbaum SI. Benefiting from mistakes: The impact of guided errors on learning, performance, and self-efficacy. Human Resource Development Quarterly 2005;16:301–307.

Morrison-Beedy D, Nelson LE. HIV prevention interventions in adolescent girls: What is the state of the science? Worldviews on Evidence-Based Nursing 2004;1:165–175. [PubMed: 17163894]

Smeeton NJ, Williams AM, Hodges NJ, Ward P. The relative effectiveness of various instructional approaches in developing anticipation skill. Journal of Experimental Psychology: Applied 2005;11:98–110. [PubMed: 15998182]

Stanley JC. Helping students learn only what they don't already know. Psychology, Public Policy, and Law 2000;6(1):216–222.

Wingood GM, DiClemente RJ. Application of the theory of gender and power for women. Health Education and Behavior 2000;27:539–565. [PubMed: 11009126]

Wolters CA. Understanding procrastination from a self-regulated learning perspective. Journal of Educational Psychology 2003;95(1):179–187.

Table 1

Training methods, indications for use, suggestions for competency assessment, and examples from research program

Training Type	Indications for use	Competency Assessment	Example of Implementation
Independent	For low complexity topics for which textbook information is readily available, and for which competency can easily be assessed.	Web-based, computer-based, or paper and pencil self-administered testing that can be graded by designated research team members or third party.	Independent training was provided for topics such as recruitment process, Health Insurance Portability and Accountability Act (HIPAA) training, and ethical considerations in research with humans. For these training topics, team members were allotted a specific amount of time to read and discuss assigned texts in preparation for subsequent competency assessments.
Self-Directed	To foster professional growth, broaden knowledge base and satisfy intellectual curiosity.	Does not include competency assessments so should only be used for non-essential training topics.	Team members were provided articles and books on behavior change theories commonly used in HIV prevention research so that staff would be able to understand the current project within the broader context of theory-based research.
Group-Didactic	This training is indicated for topics that are too complex for independent-training but for which little intra-group interaction is necessary (or desired).	Self-administered testing, assessment of content accuracy of tape-recorded intervention group sessions	Used to teach team members about the physiology of HIV transmission, including how the presence of non-HIV STDs facilitates the transmission of HIV.
Group- Interactive	Topics in which discussion is necessary to help staff better appreciate the complexity of the topic area.	Qualitative staff reports about situations encountered during the course of the project and an assessment of whether situation was handled per training protocol or if protocol was adequate to address situation.	This method was used to train on topics such as group conflict resolution. Team members role-played problem scenarios that could be encountered during intervention group sessions or attempts to contact participants for follow-up.
Simulation Based	This method is used for team members to confront planned errors or possible problems they may encounter in their roles and practice working through them in a supportive coaching environment.	Qualitative staff reports about situations encountered during the course of the project and an assessment of whether situation was handled per training protocol or if protocol was adequate to address situation.	Used with recruiters to simulate approaching a potential participant for screening and informed consent. Staff portraying adolescent girls presented with multiple unanticipated problems (as may arise during actual recruitment). The recruiter's task was to manage these problems; coaching was provided as needed.
Supervisory- iteration	For use with quality assurance and other ongoing monitoring of team productivity, particularly for personnel stationed at off-site location where close monitoring is impractical.	Periodic evaluations of role performance; assessment of content accuracy of tape- recorded intervention group sessions; periodic observation of team members in performance of their duties.	Ongoing review of audio-taped group sessions. Trained doctoral students (raters) assess the degree to which facilitators adhere to the intervention curricula and motivational enhancement techniques. Areas of underperformance and other threats to intervention integrity are documented on standardized rating sheets and facilitators receive feedback via their supervisors.

Table 2

Evidence-based research team training plan (basic research topics)

	University Orientation	Human Subjects Protection	Recruitment Protocol	Data Collection	Specimen Collection	Interventions Curricula	Retention of Participants	Survey Software
Project Director	SM, GD	I, SD, GT	---	---	---	---	---	---
Asst Project Director	SM, GD	I, SD, GT	I, SB, SV	GD, SB, SV	GD, SV	---	I, SD, SV	GD, SB,
	SV							
Recruiters	SM, GD	I, SD, GT	I, TT, SB, SV	GD, SB, SV	GD, SV	---	CX	GD, SB,
	SV							
Retention Coordinator	SM, GD	I, SD, GT	CX	CX	CX	CX	I, SD, SV	CX
Facilitators	SM, GD	I, SD, GT	---	---	---	GD, SB, SV	---	---
Research Asst (RA)-BS	---	I, SD, GT	I, TT, SB, SV	GD, SB, SV	GD, SV	---	---	---
Research Asst (RA)-MS	---	I, SD, GT	---	---	---	GD, SB, SV	---	---
Research Asst (RA)-PhD	---	I, SD, GT	I, TT, SB, SV	GD, SB, SV	GD, SV	SD, GD, SB, SV	---	GD, SB

Table 3

Evidence based research team training plan (supplemental topics)

	Group Facilitation	Motivational interviewing	HIV Info	Safer-sex behavioral skills	Gender Sensitivity	Cultural/Social Sensitivity	Resolving Conflicts	Professional Conduct	Theory to Practice
Project Dir.	---	---	CX	---	SM, SD	SM, SD, SV	I, SD, GI	GD, SV	---
Asst Project Dir.	---	---	CX	---	SM, SD	SM, SD, SV	I, SD, GI	GD, SV	---
Recruiters	CX	CX	CX	CX	SM, SD, SV	SM, SD, SV	I, SD, GI	GD, SV	CX
Retention Coordinator	CX	CX	CX	CX	SM, SD, SV	SM, SD, SV	I, SD, GI	GD, SV	CX
Group Facilitators	SM, GI, SB, SV	I, GD, SB, SV	GD, SV	GD, GI, SB	SM, SD, SV	SM, SD, SV	I, SD, SV	GD, SV	SM, SV
RA-BS	---		CX	---	SM, SD, SV	SM, SD, SV	I, SD, SV	GD, SV	---
RA-MS	SM, GI, SB	I, GD, SB	CX		SM, SD, SV	SM, SD, SV	I, SD, SV	GD, SV	SM
RA-PhD	SV	I, GD, SB, SV	GD, SV	GD, GI, SB	SM, SD, SV	SM, SD, SV	I, SD, SV	GD, SV	SM

Keys: SD-self directed, I-independent, GD-group didactic, GI-group interactive, SB-simulation based, SV-supervisory iteration, TT-two tiered sign off GT-graded test, SM-seminar, CX-cross training, RA-research assistant