PEER TRAINING OF SAFETY-RELATED SKILLS TO INSTITUTIONAL STAFF: BENEFITS FOR TRAINERS AND TRAINEES

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A peer training program, in which experienced staff trained new staff, was evaluated as a method for teaching and maintaining safety-related caregiver skills in an institutional setting for the developmentally disabled. Three sets of safety-type skills were assessed in simulated emergency situations: responding to facility fires, managing aggressive attacks by residents, and assisting residents during convulsive seizures. Using a multiple-baseline research design, results indicated that the peer training program was an effective method of training the three types of emergency skills to new direct care staff. The program also appeared effective in improving the skills of the peer trainers. Perhaps most importantly, results indicated that if experienced staff functioned as peer trainers for particular emergency skills, then their proficiency in those skills maintained over time whereas their proficiency declined in emergency skills for which they did not act as peer trainers. Social validity information collected from available staff 23 months after the program was completed supported the utility of the training in terms of staff responses during actual emergencies. Also, acceptability measures indicated that staff liked participating in the program. However, some inconsistencies between staff verbal reports and performance-based measures of acceptability were noted. Results are discussed regarding the overall effectiveness of the peer training program, the importance of maintenance strategies for safety-related skills, and the need for multidimensional analyses of staff acceptability in staff training/management research.
DESCRIPTORS: peer training, maintenance, staff, treatment acceptability, consumer satisfaction

A recent concern in applied behavior analysis is the development and evaluation of procedures for increasing safety-related behaviors. Various strategies for promoting safety have been investigated including reducing industrial accidents (Komaki, Barwick, & Scott, 1978; Sulzer-Azaroff, 1978; Sulzer-Azaroff & deSanta Maria, 1980), training pedestrian skills (Page, Iwata, & Neef, 1976; Yeaton & Bailey, 1978), making emergency telephone calls (Risley & Cuvo, 1980), and improving safe driving practices (Larson, Schnelle, Kirchner, Carr, Domash, & Risley, 1980; Parsons, 1976). Typically, the focus of safety research has been on changing behaviors of potential victims of accidents. A more complex problem exists in settings in which potential victims are not likely to acquire safety skills because of physical disabilities or severe behavioral deficits. An example of such a setting is residential, human service agencies for the severely/profoundly developmentally disabled. To prevent harm to handicapped residents in these facilities during accidents or emergency situations, caregivers who are responsible for the residents must adequately perform safety-related skills.

Facility fires require safety skills of caregivers. Recently, the tragic outcomes that can result from fires received national attention when 23 handicapped persons died in a fire in a residential facility (Associated Press, 1980). A potential emergency or accident situation that is more specific to institutions for the developmentally disabled is convulsive seizure activity by residents. Several surveys (see Richardson, Koller, Katz, & McLaren, 1981 for a review) have indicated that severely and profoundly retarded persons, who represent the largest portion of institutional populations (Scheerenberger, 1976), have a high incidence of epileptic seizures relative to less seriously retarded, and nonretarded, populations. Failure of caregivers such as institutional attendants to respond appropriately to seizure activity can result in serious harm to residents (Livingston, 1963). A similar situation that requires appropriate action by staff to reduce or prevent physical harm occurs when a resident becomes extremely aggressive (Harvey & Schepers, 1977). As with seizure activity, there is a relatively high incidence of assaultive individuals among institutionalized populations (Boe, 1977).

Despite the importance of institutional caregiver performance in emergency situations as just noted, methods of developing relevant emergency or safety-related skills with caregivers have not been systematically investigated. A foundation for developing such methods exists in the research on training and managing other areas of institutional staff performance (for reviews, see Gardner, 1973; Prue, Frederiksen, & Bacon, 1978; Miller & Lewin, 1980; Whitman, Scibak, & Reid, 1983). Although this research has documented a variety of effective behavior change techniques, it has been criticized for its lack of attention to maintenance effects of various interventions (Ivancic, Reid, Iwata, Faw, & Page, 1981; Whitman et al., 1983). Maintenance of emergency skills warrants special concern because the skills are typically performed at a low frequency with limited opportunity for practice and subsequent reinforcement. That is, although emergency situations such as seizures

and aggressive acts are relatively frequent in institutional settings as indicated earlier, these occurrences are usually distributed institution-wide among the resident population and a given staff member will not encounter seizures or assaultive actions of each resident. Hence, there is typically an institution-wide concern for handling emergency situations on a daily basis but an individual staff person is likely to respond to such emergencies on a much less frequent schedule.

One potential method for teaching and maintaining safety-related skills is a peer training system in which staff train other staff. Credence for a peer training approach stems from previous research with classroom teachers (Jones, Fremouw, & Carples, 1977). As Jones et al. point out, a peer training (or "pyramid" training) approach may have the advantage of cost efficiency in that less professional time is required for training staff than with typical staff development programs. Cost efficiency is a desirable characteristic of programs for improving staff performance in public institutions (Iwata, Bailey, Brown, Foshee, & Alpern, 1976; Montegar, Reid, Madsen, & Ewell, 1977; Page, Iwata, & Reid, 1982). Additionally, a peer training program may have the advantage of a type of helper effect (see Jones et al., 1977 for a discussion) by enhancing the maintenance of safety-related skills of the peer trainer. For example, as opposed to using specific procedures only during actual emergency situations, peer trainers could review and subsequently maintain their own skills by working with the peer trainees.

The purpose of this project was to evaluate a peer training program for developing and maintaining safety-related skills among institutional direct care staff. More specifically, effects of the program were evaluated with peer trainees and trainers in regard to their use of appropriate procedures in three simulated emergency situations: a facility fire, an aggressive attack by a resident, and a convulsive seizure by a resident. Simulated emergencies were used as with previous research (Jones & Kazdin, 1980; Jones, Kaz-

din, & Haney, 1981) because of the ethical problems prohibiting the initiation and manipulation of actual emergencies. However, social validity measures (Wolf, 1978) as to the utility of the program in this respect were conducted through staff reports collected when staff had been on the job over one and a half years after participating in the program. An evaluation of staff acceptance (Kazdin, 1980) of the program was also included. However, whereas previous evaluations of acceptability of staff management programs have relied on staff verbal reports (Burgio, Whitman, & Reid, 1983; Greene, Willis, Levy, & Bailey, 1978; Korabek, Reid, & Ivancic, 1981; Quilitch, 1978; Quilitch, de Longchamps, Warden, & Szczepaniak, 1977), the current project evaluated verbal reports of acceptability and whether or not staff actually engaged in a reportedly acceptable activity when given a choice to do so.

METHOD

Participants

Thirteen institutional direct care staff, 10 women and three men, participated in various aspects of the study. Biographical characteristics, educational backgrounds, and job responsibilities were similar to those reported with other institutional staff (Iwata et al., 1976; Reid, Schuh-Wear, & Brannon, 1978). Ages ranged from 18 to 60 yr, duration of employment at the institution from 1 wk to 21 yr, and educational backgrounds ranged from not having completed high school to the final semester of an undergraduate college program. Specific job responsibilities included providing simple nursing care, assisting in personal care such as bathing and dressing, conducting various training programs (e.g., self-help, simple social skills) for residents who were physically handicapped or severely or profoundly retarded, and generally maintaining the order and cleanliness of the residents' living areas. There were four distinct groups of staff for purposes of this study: train-

ees, control trainees, maintenance condition trainees, and trainers.

Trainees. Four staff who had been at the facility for less than 6 mo (probationary period according to state civil service regulations) participated as trainees. These staff members were named by their supervisors, when requested by the experimenter, as likely to benefit from additional training in emergency procedures. Each attendant was contacted by the director of staff development (experimenter) and invited to participate. It was explained to staff that other, more experienced attendants would be training new attendants in emergency skills and that this new training system was being evaluated for possible use with all new direct care personnel. It was also explained that participation was voluntary. All four employees agreed to participate. In the last experimental condition in the study, maintenance, trainees who had previously mastered all emergency skills were invited to continue to participate in the project as maintenance condition trainers.

Control trainees. Two attendants who had been employed at the facility for less than 6 mo served as control trainees and were selected at the same time and in the same way as other trainees. However, since the control trainees would not be receiving training, the part of the project that they were participating in was described as a series of assessments of skills. Both employees agreed to participate.

Maintenance condition trainees. During the maintenance experimental condition, three newly hired employees were identified and invited to participate in the same manner as the original trainees. Each person agreed to participate.

Trainers. Four attendants who had been employed at the center for at least 6 mo participated as trainers. Supervisors were requested by the director of staff development to identify staff who they deemed to be responsible, organized, and effective trainers with residents. Each attendant selected by a supervisor was contacted by the staff development director, advised of the

nature of the project and the supervisor's recommendation, and invited to participate. All four attendants who were contacted agreed to participate as trainers.

Setting and Apparatus

The study was conducted in an 87-bed, residential and out-patient developmental disabilities facility. Training workshops for trainers were conducted in a staff development classroom. All other training and all assessments were conducted on the living units of the residents, which were the regular work areas of the attendants and where they would be expected to use the emergency skills.

All equipment used during assessments and training was indigenous to the residential units. Specifically, during seizure management assessments, staff were required to locate and identify oxygen tanks and a suction apparatus, and to move unit furniture away from the convulsing victim (role playing experimenter assistant). During assessments of the "armed resident attack" portion of self-defense, participants were required to hold a chair between themselves and the role playing assistant. For fire procedures, two small dolls (approximately 203 mm in height) served as analogue residents during the first baseline assessment but were then discontinued and staff were instructed to evacuate imaginary full-size residents for all remaining assessments. Also during evaluation of the emergency fire procedures, staff members used the fire evacuation map that was posted on the work unit wall.

Specification and Validation of Emergency Procedures

To substantiate the importance of the three emergency procedures, supervisors of the resident living areas in the facility were consulted. All supervisors agreed that each of the three procedures was important, and that staff performance had been observed to be inadequate. Also, a review of facility records indicated that emergency situations such as hard seizures by residents

and aggressive resident attacks that resulted in harm to staff members had occurred recently. Records further indicated that during fire drills, staff did not act in accordance with facility policies and procedures.

After support was obtained concerning the importance of the procedures as well as the need for additional staff training, each procedure was task analyzed into component steps. Initial analyses were based on the identified component steps as reported in the facility's official policies and in the curricula used in the orientation class for new employees. To provide social validity for the initial analyses (see Jones et al., 1981), department heads who were responsible for that aspect of the facility's operations (e.g., the director of nursing for the seizure management portion; the facility safety director for the fire procedures) reviewed the identified components and modifications were made in order to comply with each department head's recommendations. Each department head also identified "essential" steps for each procedure that must be performed. Next, a proportion of the remaining steps that needed to be demonstrated to achieve mastery of the procedure was identified. Hence, for a skill to be considered mastered, the employee was required to perform all the steps identified as essential and to demonstrate a selected percentage of the remaining steps. For example, during seizure management, the participant had to respond correctly on four performance items (assisting the victim to the floor, turning the victim on his or her side, moving nearby objects away, and locating oxygen and suction apparatus) as well as two knowledge items (i.e., correct verbal responses to "should you physically restrain a convulsing victim?" and "should you provide liquids afterward if a victim asks for a drink?"). Of the remaining 11 components for seizure management, nine had to be correct for mastery of that procedure. Thus, of a total of 17 items, 15 had to be performed correctly although an individual could still exceed this percentage but not master a skill if one essential step was omitted. All correct steps for the three skill

Table 1

Component Steps for Seizure Management Procedure

Number	Step
1*	Staff member (S) assists resident (R) to floor within 10 sec
2*	S lays R on side so that mouth/nose points to floor (does not insert anything in mouth)
3*	S clears objects out of R's reach (extended arms or legs)
4	S checks time within 30 sec of onset
5	S calls for nurse (or describes) within 30 sec of onset
6	Within 30 sec of question, S can describe paging for nurse if none on Unit
7	S states "code 1" is page code within 30 sec
	S states nurse will want to know:
8	Seizure duration
9	Movements during seizure
10	Breathing difficulties
11	Color changes (blueness)
12	Possible cuts, bumps, bruises or other events requiring an accident report
	In response to questions from the examiner, S states:
13*	"Not to hold limbs" (Note: may say "put pad under head")
14*	Says "no liquids" immediately after
15	Says to take temperature
16	Says to record seizure (or tell nurse to record)
17*	S begins to locate and identify suction and oxygen equipment within 30 sec

*Mastery criterion includes steps with an asterisk plus nine out of the 11 remaining steps.

Table 2

Component Steps for Fire Procedure

Number	Step
1*	Staff member (S) removes resident (R) from room (closest to fire first, or simultaneously), before reporting or fighting fire
2*	S identifies unit fire alarm box verbally, or by pointing or touching, before using phone or fighting fire
3	S states must call boiler room (or maintenance, engineering or #129 or #160) after removing R from room and pulling fire alarm, before evacuating ward and before fighting fire
4	S describes and initiates closing doors (windows optional)
5*	In response to a question from the examiner, S describes 1st, 2nd, and 3rd escape routes off unit (S may look at map, does not have to describe route once off own unit)
6	In response to question, S describes waiting at evacuation point until evacuation signal given or fire is directly threatening or drill is over
7*	S describes counting residents at building exit
8	When requested, S locates nearest fire extinguisher
9	S demonstrates or describes use of the safety mechanism, trigger and pointing of fire extinguisher
10	S states what fire core number is (code 13)

*Mastery criterion includes steps with an asterisk plus four out of the six remaining steps.

areas of seizure management, fire procedures, and self-defense are presented in Tables 1-3. Also listed in the tables are essential steps and the requisite proportions of the remaining steps used to determine mastery of each skill.

Observation System

Observer training. Observers included two student interns, an experimenter, and a staff development employee. Throughout the study, the interns and the staff development employee were uninformed regarding which skills had been trained with specific staff members. During observer training, observers reviewed data sheets and response definitions, as well as descriptions of likely errors, and then scored verbal descriptions of analogue emergency assessments from an audiotape. When one or zero disagreements were obtained on the audiotape scoring, the experimenter and observers took turns serving as an imaginary victim and mock participant, while the remaining observers scored the participant's behavior. When one or zero disagreements had been obtained on component responses for all three skills during an assessment of a mock participant, the observer was considered trained. The audiotapes used to train observers were preserved throughout the course of the project and observers were periodically retrained with the tapes to help prevent observer drift (Kazdin, 1977).

Table 3

Component Steps for Self-Defense Procedure

Number	Step
1*	Staff member (S) stands within reach of resident (R) within 5 sec of hit
2	S states R's name and instructs incompatible response within 10 sec of the hit
3*	S physically prompts desired response within 10 sec of instructions or within 20 sec of hit
4	S blocks punch with same-side arm, with hand fisted (thumb contacting fingers) and using forearm (between wrist and elbow joint)
5	S blocks kick by raising same-side leg 6 inches with foot partially occluding support leg and torso turning approximately 90° to the side
6	S releases clothing grab by thumb pry within 5 sec of grab
7	S releases body part grab by thumb or rotating out within 5 sec of grab
8	S lifts and holds chair between self and R's chair within 5 sec of attack
9*	S states criteria for use of self-defense technique as per policy; to protect people (any) and property

*Mastery criterion includes steps with an asterisk plus four out of the six remaining steps.

Observation procedures and reliability. During assessments of staff skills in performing the emergency procedures, an observer recorded the occurrence or nonoccurrence of each correct component behavior as identified in Tables 1-3. An occurrence was scored if participants both performed and described the correct action. An incorrect response (i.e., nonoccurrence of correct) was scored if either a verbal or performance component was incorrect or omitted. An incorrect response was also scored if a participant began to perform an incorrect response but then self-corrected. During assessments the observer did not interact with the staff member being assessed and attempted to stay as far away from the staff person as possible yet still be able to see and hear the staff member's performance.

Reliability observations occurred by having two persons simultaneously but independently observe and record the staff person's perfor-

mance. Reliability checks were conducted on 37% of all baseline assessments and 22% of all assessments during the posttraining and maintenance conditions, including during assessments for all experimental trainees and trainers. Observers' records were compared on a per response basis, and interobserver reliability scores were computed by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. This formula was used to compute agreement percentages for occurrences of correct responses, nonoccurrences of correct responses, and overall occurrences plus nonoccurrences (Bailey & Bostow, 1979). For each of the three emergency procedures, overall reliabilities averaged above 90% and occurrence reliabilities averaged at least 81%. Nonoccurrence reliabilities were lower, averaging 67%, 77%, and 72%, respectively, for fire, seizure, and self-defense skills. The lower reliability averages for nonoccurrence scores were due to low error frequencies by participants following training so that a small number of disagreements between observers resulted in low reliability scores. Across all reliability checks across all emergency skills and participants, there was one or zero disagreement on the nonoccurrence of a component step on 75% of the checks. On 93% of the reliability checks there were no more than two disagreements.

Experimental Conditions

Baseline. As noted previously, ethical considerations preclude the creation of bona fide emergencies. Hence, assessments of analogue scenarios were conducted by having an experimental assistant "play the part" of a resident. Throughout the assessments, the assistant was uninformed as to which staff members had received training in any of the skills. At the beginning of an assessment, a staff participant was asked if he or she could interrupt his or her ongoing work task for 5 to 10 min. Assessments, like real emergencies, were not scheduled with

staff in advance so that staff could not predict when they would occur. On one occasion when an employee was asked to participate in an assessment, the employee requested that the observers return in 15 min due to an ongoing activity. On all other occasions, staff members participated in the assessment immediately when asked. The assessments were conducted in an unoccupied resident living room, dining doom, bedroom, or staff office on the staff member's work unit. Assessments began when the participant was asked by the experimenter to demonstrate and describe how he or she would respond in a seizure (or fire or self-defense) situation. The experimental assistant then began his or her role playing. For example, in a self-defense assessment the assistant "attacked" another (imaginary) resident (to assess instructions, prompts, and protection of residents by the staff member) and then "attacked" the participating staff member. The staff participant was expected to separate the two "residents," say "(Name), go sit down" (or instruct the resident to engage in some other incompatible behavior) and physically prompt the appropriate response within specified time limits. The participant was then expected, on request from the experimenter, to describe and demonstrate how to protect himself or herself from various hand strikes (see Table 3), kicks, grabs, and objects thrown by the resident. Additionally, the participant was requested to specify what the center policy stated concerning appropriate circumstances for the use of self-defense techniques.

During fire procedure assessments, the staff member was asked to "pretend" a fire was burning in the room and that several residents were present, and then to demonstrate and describe what to do. During seizure management assessments, the experimental assistant played the role of a convulsing resident and the staff member was requested to show and tell what he or she would do. Throughout all assessments, no feedback was provided to staff members regarding the correctness of their actions, although they were thanked for participating.

Prior to the initiation of assessments, each participant had received some training in the three emergency procedures as part of the facility's orientation program at the beginning of his or her employment. Typically, the training consisted of general descriptions of the procedures (as opposed to presentations of each component step), demonstrations by the instructors, and written examinations regarding the procedures. During the orientation it was not standard practice for the employees to demonstrate proficiency in performing a skill, due in part to time limits with the orientation program.

Training. During the training condition, assessments were conducted in the same manner as during baseline except that at other times during the day or week, training was occurring. The training program consisted of two primary components. First, staff trainers were taught how to train new staff (trainees) in emergency procedures via a workshop format. Second, staff trainers taught trainees how to conduct the emergency procedures via a peer training format.

The workshop was conducted with all four staff trainers together one time for each of the three emergency procedures. Initially, the correct steps comprising a particular emergency procedure were reviewed during the workshop. The experimenter described the component steps and then distributed written descriptions of the steps. Next, each staff trainer practiced the steps during a simulated emergency with the experimenter while other staff trainers watched. The experimenter gave positive and corrective feedback contingent on each staff member's performance. Each staff member was required to reach mastery criterion for the emergency procedure on one trial without experimenter assistance during the workshop.

To prepare the staff trainers for the peer training with the staff trainees, information was provided during the workshop concerning actual teaching strategies and general logistical considerations. Regarding teaching strategies to use with trainees, trainers were instructed to use the

approach that they had just participated in during the workshop, to try to use more praise statements than corrective feedback, and to solicit procedural questions from the trainees. Also, trainers were shown how to complete data sheets to indicate whether or not each step in the emergency procedure was completed correctly by the trainee, and to indicate the amount of time spent in each training session via recording session onset and offset times.

Several logistical considerations were covered in the workshop. First, times generally considered to be good for training were noted in terms of minimizing interference with other trainer and trainee job responsibilities. For instance, one optimal time was after residents had gone to bed and staff work breaks were completed. However, no formal scheduling of trainer/trainee sessions was conducted; rather, it was left to the trainer to establish his or her own schedule with the trainee. Second, trainers were requested to devote no more than 20 min to each training session. Third, instructions for turning in completed data sheets on trainee performance to the staff development office were provided. Following each workshop, each trainer worked on the emergency skill covered in the workshop with one trainee prior to participating in another workshop for a different skill.

Each workshop lasted from 30 to 60 min, and each was conducted in the same manner with two exceptions. First, during the second and third workshops, trainers were encouraged to review previously taught skills, but not to train any skill that had not been previously covered in a workshop. Second, also in the second and third workshops, trainers were asked to complete participant satisfaction questionnaires (see *Acceptability Measures*).

Within 2 days following each workshop, each staff trainer was assessed on his or her regular work unit on all three emergency skills. When the staff member obtained mastery on the procedure targeted in the workshop during the assessment on the work unit (which occurred on the first assessment following the workshop

for all trainers for each of the three emergency procedures), he or she was considered ready to commence peer training and a staff trainee was assigned to him or her. Assignment of trainee to trainer was based on both persons working in a similar residential area, and was arranged to maximize the number of days during each week that both employees were scheduled to work.

During peer training, each staff trainer worked with a staff trainee individually within a given session. When the data sheets completed by the trainers indicated that all trainees performed the emergency procedure at mastery level during two consecutive training sessions, then assessments of the trainee's skills were conducted and the staff trainers participated in a workshop for another emergency skill. The initial assessment and peer training sequence was then repeated.

To enhance the expediency with which peer training sessions were conducted, specific prompting procedures were implemented by the staff development director. That is, when 2 days elapsed with both members of a peer training pair present at work but no peer training data sheets were received in the staff development office, then a prompt was provided. The staff development director located the peer trainer and questioned him or her about the process (e.g., "how is the peer training going?") or more specifically requested him or her to try to train more frequently (e.g., "please try to do the training after the kids are bathed tonight.").

Maintenance. After all original staff trainers and trainees had demonstrated mastery on each of the three emergency procedures, each staff person was asked if he or she would like to train new employees in an emergency procedure. When the maintenance condition began, one original trainer had terminated employment at the center and one was on medical leave. Of the remaining two original trainers, both indicated they did not want to train another new staff member. Of the four original trainees, one had terminated employment. The remaining three

chose to participate, and were each assigned one new employee (maintenance condition trainee) to train.

When an original trainee indicated a willingness to become a maintenance condition trainer, he or she was provided with instructions for peer training in an individual meeting with the experimenter. Individual as opposed to group meetings were conducted because the trainees reached mastery criterion on the emergency procedures and were invited to become maintenance condition trainers at different times. During the meeting, the same information provided to the original trainers was presented concerning how to conduct peer training. However, the specific steps comprising an emergency procedure were not reviewed or practiced. Only information pertaining to staff training procedures was provided such as using the same approach that the staff trainer had used previously with him or her, such as scheduling times for training sessions, giving frequent praise to the new maintenance condition trainee, and how to use data sheets. Each meeting lasted 3 to 10 min. Each maintenance condition trainer was asked to teach one new emergency procedure to one maintenance condition trainee. When the maintenance condition trainer began peer training, data sheets were turned in to the staff development office following training sessions. A visual representation of the major events during training and maintenance, indicating how original trainees became maintenance condition trainers, is presented in Figure 1.

Experimental Design

A multiple-baseline design across emergency skills was used to evaluate the effects of the training program on the skills of the trainers and trainees. More specifically, the trainers participated in a workshop and conducted peer training, and the trainees received the peer training from the trainers, first for seizure skills, then emergency fire skills, and finally defense skills. Throughout the investigation, the two control trainees participated only in assessments.

One control trainee participated in seven baseline assessments and one participated in five. No trainee who received training participated in more than five baseline assessments for any skill prior to training (average of four assessments across the three skill areas and trainees); hence, the generally greater number of baseline assessments for the control trainees served as a partial control for the reactivity of assessments as well as the effects of continued practice without training. The second control trainee's resignation from the facility prohibited additional assessments. In this respect, it should also be noted that after the study the control trainee who remained at the facility was moved into another staff position which reduced the need for her to be trained eventually in the targeted emergency skills. A second research design was used to evaluate the effects of a maintenance condition trainer (former trainee) training an emergency procedure skill to a new staff member on the maintenance of that skill by the former staff person. That is, the performances of the maintenance condition trainers were evaluated by comparing the maintenance of the skill that each trainer taught versus maintenance of the skills each trainer did not teach. Each maintenance condition trainer trained a different skill to a new trainee: GB taught fire safety skills, VC taught self defense, and ZR taught seizure management skills. Assessments of the maintenance condition trainers' skills were conducted 18 wk following completion of the formal training program (i.e., when original trainees were trained prior to becoming maintenance condition trainers).

Acceptability Measures

In an attempt to assess treatment acceptability, original trainers were asked to respond to five items on an anonymous self-report questionnaire during the second and third workshops. For three items (trainers have adequate skills to train other staff; being a trainer is enjoyable; would like to continue training additional staff), staff were asked to mark disagree, agree, or
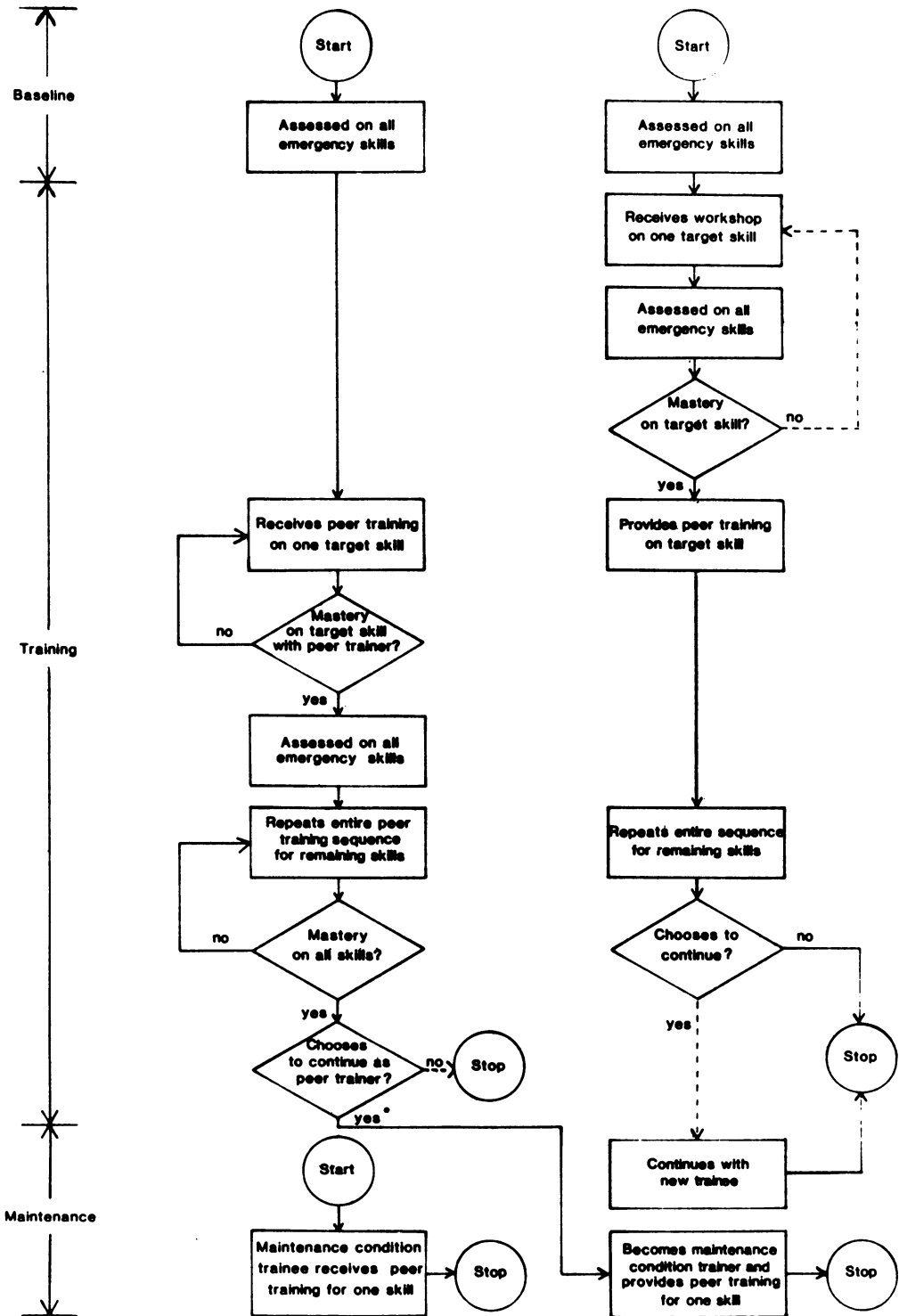
Fig. 1. Flow diagram of sequence of major events during baseline, training, and maintenance conditions. Dashed lines indicate parts of the procedures that were planned but never actually occurred.

strongly agree. On one item (were trainees usually willing to be trained) staff were asked to mark no, sometimes, or yes. The fifth item (what is the most difficult aspect of being a staff trainer) was an open-ended question. In addition to the questionnaire measures regarding the acceptability of the peer training procedure, actual responses by staff to invitations to continue as trainers during the maintenance condition were available as described earlier. By using both sets of acceptability measures, a tentative indication of the validity of verbal report of acceptability versus measures more directly related to actual performance was possible.

Social Validity Measures

In addition to evaluating staff acceptance of the training program, attempts were made to evaluate the social validity of the effects of the training. Specifically, available staff were asked regarding their views of the benefits of the training if and when they had been in an emergency situation following participation as a peer trainee. Staff who had been trained in the program and were still employed at the facility were contacted 23 mo after receiving the training via telephone by an experimenter (who was no longer affiliated with the facility). After identifying himself, the experimenter asked three questions. First, had the employee had a chance to use the target procedures in terms of experiencing an actual emergency (if the response was "no," the employee was asked if he or she thought he or she would be better off in an emergency because of the training). Second, had the training been helpful and third, should employees train other employees in the future on safety skills? For the second part to question one and to question two, the employees were asked to respond with one of the following categories; no, somewhat, or very.

Time Efficiency Estimates for Training

To estimate the amount of time required of the trainers and trainees, records were maintained of the duration of training sessions as indicated on the data sheets completed by the trainers.

RESULTS

Trainees

Figure 2 presents the percentage of component steps completed correctly by each of the four trainees on seizure management, fire procedures, and self-defense emergency skills. Each data point represents one assessment. During baseline no trainee performed at mastery levels (mastery is designated by open circles) on any skill except RB on one assessment. Mean baseline percentages of correct steps completed averaged across all assessments and trainees were 42%, 53%, and 43% for seizure, fire, and self-defense, respectively. After receiving peer training, each trainee performed at mastery levels on every skill at least three times and on at least the last two consecutive assessments for each skill.

The performance of the original trainees after they participated as maintenance condition trainers is reflected in the results of the assessment conducted 18 wk after the last assessment during the training condition (Table 4). The performance of each maintenance condition trainer maintained above mastery level on the emergency skill he or she trained to the new maintenance condition trainee. However, for the two skills that each maintenance condition trainer did not train to a new trainee, mastery was maintained in only one instance—ZR with self-defense. Table 4 also shows that each of the three new maintenance condition trainees achieved mastery on the emergency skill on which he or she was trained but not on any skill on which he or she was not trained by the maintenance condition trainer.

Control Trainees

Performances of the two control trainees who participated in assessments but received no peer training showed no apparent increases in any skill. For one control trainee, minimum and
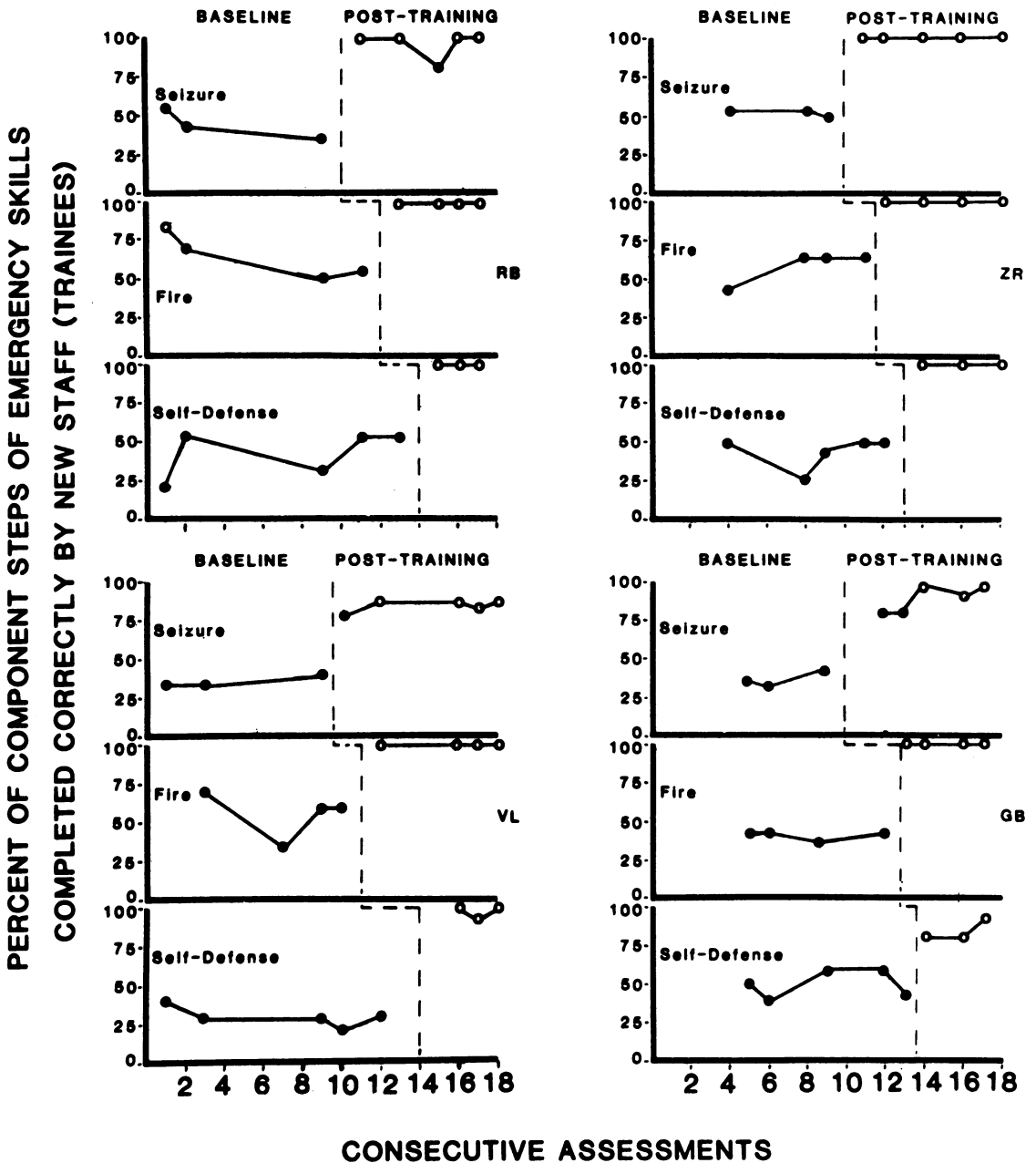
CONSECUTIVE ASSESSMENTS

Fig. 2. Percentage of component steps of the three emergency skills for seizure management, fire, and self-defense completed correctly by staff trainees across consecutive assessments during baseline and posttraining. Intervals between data points vary since each assessment did not involve each skill for every trainee. Open circles indicate performance at above mastery levels whereas solid data points indicate below mastery performance.

maximum percentages of steps completed correctly on her five assessments were: seizure 59% and 65%, fire 40% and 50%, and self-defense

44% and 44%. For the second control trainee, her seven assessments resulted in the following minimum and maximum performances: seizure

Table 4

Performance of maintenance condition trainers (original trainees) and maintenance condition trainees during the maintenance assessment.

Maintenance Condition Trainer	Emergency Skill	Percent Steps Correct	Maintenance Condition Trainee	Emergency Skill	Percent Steps Correct
GB	Seizure	82	BS	Seizure	82
	Fire	100(M)[a]	← →[b]	Fire	100(M)
	Defense	56		Defense	22
VC	Seizure	71	ZI	Seizure	59
	Fire	70		Fire	50
	Defense	100(M)	← →	Defense	100(M)
ZR	Seizure	100(M)	← →	Seizure	94(M)
	Fire	90	LM	Fire	40
	Defense	78(M)		Defense	56

[a](M) indicates the skill was performed at mastery criterion.
[b]Arrow indicates the one emergency procedure that each maintenance condition trainer taught to each maintenance condition trainee.

59% and 65%, fire 40% and 80% (80% occurred during the third and fourth assessments), and self-defense 22% and 33% (33% occurred on the second and third assessments). Neither control trainee achieved mastery performance on any skill during any assessment.

Trainers

Effects of the trainers' participation in the training program are represented in Figure 3. The first data point in the posttraining condition represents the first assessment after the workshop and all remaining posttraining points reflect performance after the peer training component commenced. No trainer ever performed at mastery levels prior to receiving a workshop. Mean baseline percentages of steps completed correctly averaged across all assessments and trainers were: 53%, 53%, and 33% for seizure, fire, and self-defense, respectively. Posttraining means were 96%, 94%, and 95% for the three respective procedures. All trainers performed at mastery levels on each skill during all posttraining assessments except MF.

Acceptability Measures

A total of eight anonymous evaluations were turned in by the four original trainers during the second and third workshops. On question one (trainers have adequate skills) and question two (being a trainer is enjoyable) a total of eight "agree" responses were received. On question four (were trainees usually willing to be trained), four "yes" and four "sometimes" responses were received. On question three (I would like to continue training additional staff) all eight questionnaires were returned "agree." However, as noted earlier, two out of two trainers who were later asked declined to train other staff during the maintenance condition. On question five (what is the most difficult aspect of being a staff trainer) four persons cited interpersonal difficulties and five cited "time and scheduling" as a problem (one trainer identified two areas that were "most difficult aspects").

Social Validity Measures

At the time of the 23-mo follow-up telephone survey, none of the four original trainees was still employed at the facility. However, two of the three maintenance condition trainees were employed and were surveyed. One, BS (Table 4), who had been trained in the fire procedures, reported in response to the first question that she had not used those particular procedures (i.e., there had not been a real fire at the fa-
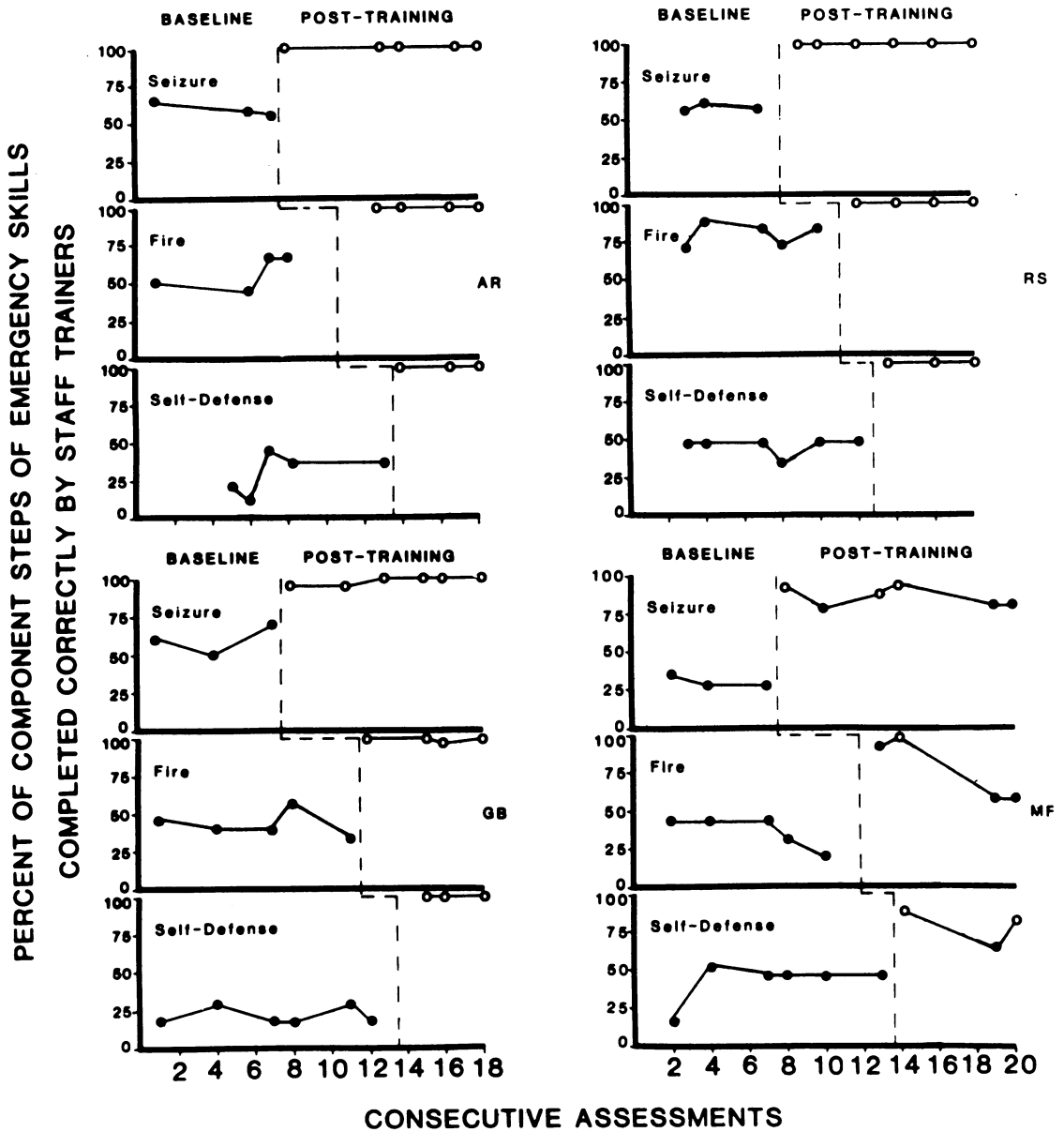
Fig. 3. Percentage of component steps of the three emergency skills for seizure management, fire, and self-defense completed correctly by staff trainers across consecutive assessments during baseline and posttraining. Intervals between data points vary since each assessment did not involve each skill for every trainer. Open circles indicate performance at above mastery levels whereas solid data points indicate below mastery performance.

cility) but that she thought she would be somewhat better off in an emergency because of the training. She also stated that the training was somewhat helpful (question 2) and that such peer training should occur in the future ("yes" to question 3). The second maintenance condition trainee (ZI) had received training in self-defense procedures and reported that she had used the procedures several times since the training, that the procedures had been very helpful, and that

employees should continue to train other employees.

Time Efficiency Estimates for Training

A total of 52 training sessions was reported by original trainers via the established method of forwarding data sheets to the staff development office. Of these, 46 sessions, or 88%, had completed session start and stop times. The mean duration reported for training sessions was 3.35 min, with a reported range of .5 to 15 min. The maximum number of reported training sessions for all peer training pairs per emergency procedure was nine. If mean session duration (3.35 min) is multiplied by the reported maximum number of sessions to mastery (nine), then a conservative estimate of total time necessary for training (excluding assessments) for each trainee per emergency procedure would be 30.15 min. A conservative estimate of trainer time for training each emergency procedure would be 30.15 min plus 60 min (maximum) for the initial workshop, totaling 90.15 min.

DISCUSSION

Results indicated that the peer training program was effective in developing safety-related caregiving skills among institutional direct care staff. After receiving peer training, all four original trainees consistenly demonstrated mastery of the skills necessary to conduct fire escape, seizure management, and self-defense procedures during simulated emergency situations. Three additional staff (maintenance condition trainees) also demonstrated mastery of an emergency procedure after having participated in the peer training program in one respective skill area. The multiple-baseline evaluation of the program with the original trainees demonstrates that the peer training was responsible for the skill acquisition. Also, the fact that the two control trainees who received only assessments without training (in most cases with more baseline assessments than the trainees who eventually received training) did not improve in the emergency skills, adds to the demonstration of functional control of the training program.

In addition to representing an effective method of teaching emergency skills to new direct care personnel, the peer training program appeared advantageous for attendant staff who participated as trainers in two respects. First, by participating in the workshop regarding how to conduct peer training and then actually conducting the training, the emergency caregiving skills of the four original trainers improved from below to above mastery levels (although MF's proficiency was somewhat inconsistent). Second, and perhaps more importantly, the peer training procedure was effective in maintaining mastery-level emergency skills of the trainers. The 18-wk follow-up assessment indicated that all original trainees who functioned as maintenance condition trainers maintained their skills in the respective procedure they trained but not in the procedures they did not train (with the exception of one staff person with one procedure that was not trained). Since each maintenance condition trainer trained a different emergency procedure, the maintenance results could not be attributed to the ease of maintaining one particular type of skill. Also, the maintenance could not be due to repeated instructions provided to the trainers regarding the use of the procedures. Throughout the time the original trainees functioned as maintenance condition trainers, the experimenter never reviewed the component steps of the three skill areas, only the logistics of conducting peer training.

The positive maintenance results assume special significance when considering the nature of emergency caregiving skills. As noted earlier, safety-related skills are not performed often relative to other caregiving skills since opportunities to practice (i.e., actual emergencies) the skills are limited. Hence, deterioration in performance of the skills is likely. The trainer role in the peer training program appears to be one method of avoiding the likely decrement in proficient performance of these types of skills. Peer training would seem to be particularly useful in

those institutions with high staff turnover, a common problem in many facilities (Zaharia & Baumeister, 1978). In these settings there would constantly be a pool of new staff for trainers to train. In contrast, in those facilities with low staff turnover, the peer training approach would need to be supplemented with other maintenance strategies because of smaller numbers of new staff to train. However, when considering the estimated average of 30% of a work force "turning over" every year in institutions (Bensberg & Barnett, 1966), there is probably an ample amount of new "trainees" in most residential facilities for a peer training approach to be worthwhile.

Results of the time efficiency estimates indicated that only an approximate half hour of trainee time was required for the trainees to acquire each set of emergency skills, and one and one half hour of trainer time. When compared to other types of staff training endeavors in other skill areas that required anywhere from six to 200 hours of trainee time (Gardner, 1973), the time efficiency data here suggest that the peer training program was time efficient. However, these results should be interpreted very cautiously, since comparisons of training programs across skill areas are obviously confounded by the type of skill targeted. To our knowledge, there are no published data available regarding time efficiency of other procedures for training institutional staff in the types of emergency skills targeted here. Hence, time efficiency comparisons for training safety-related skills are prohibited at this time. Also, in the current investigation the lack of reliability measures on the training time as reported by staff limits the strength of conclusions that can be drawn from the time efficiency data. Subsequently, a useful area for future research would be direct comparisons of the time efficiency of the peer training program versus more traditional staff training approaches.

Similar to the cautions expressed in previous research on emergency-type skills (Jones & Kazdin, 1980; Jones et al., 1981), the results here

should not be interpreted to mean that the staff could perform proficiently in actual emergencies. Specifically, although simulation situations are a necessary part of research on emergency behaviors, skills demonstrated during simulations do not ensure that the same skills will be exhibited in a true emergency. However, this study attempted to increase the probability that the skills demonstrated during the simulation would generalize to a bona fide emergency relative to previous research (e.g., Jones & Kazdin, 1980; Jones et al., 1981). For instance, training and assessments occurred in the same physical environment in which staff would use their skills during an emergency as opposed to a classroom-type setting that is designed to approximate the location in which an emergency would occur. Also, the assessments of emergency skills occurred on an unpredictable schedule, similar to the occurrence of actual emergencies, as opposed to more structured, predictable times.

The results of the social validity measures, albeit only a small amount of data due to staff turnover at the facility, provide additional support for the contention that the benefits of the training would extend to true emergencies. For instance, the trainee contacted during the survey who had been faced with emergency-type situations (aggressive residents) since receiving peer training reported that the program had been very helpful to her in handling the situation and that such peer training should continue. Also, when originally attempting to obtain social validity data, two supervisors at the facility were questioned via telephone about their views of the value of the peer training program in terms of staff response to emergencies. Both supervisors supported the program. Specifically, the supervisors, one of whom had been an original peer trainer in the study and had since been promoted, reported that peer training with new employees was not ongoing at that time because of a state hiring freeze but that they planned to reinstitute the program when they could again hire new employees. Although these reports should not be taken as hard data (see next para-

graph on acceptability measures), they nevertheless provide one important indication of the social validity of the program's effectiveness (Wolf, 1978).

Results regarding the acceptance of the program by staff were somewhat inconsistent. The acceptability survey, which represents the usual method of evaluating the acceptability of institutional staff training/management programs as noted earlier, indicated that staff enjoyed participating in the program and that they would like to participate again. However, when the program was reinstituted with new staff, both former trainers who were available and given the opportunity to participate again declined to do so (although staff who had previously participated as trainees did choose to function as trainers). These results, plus the comments indicating time and scheduling problems with the program as reported on 62.5% of the acceptability measures, suggest that peer training might best be incorporated into attendant job descriptions in order to reduce the interference of "required" job duties versus "voluntary" tasks. Alternatively, continued research with the peer training program could focus on methods of making the procedure more acceptable to staff. Also, the results indicate that the previously reported acceptability data in staff research that was based solely on staff verbal reports should be interpreted cautiously and that future investigations should include more performance-based measures of acceptability.

Another area warranting investigation is an analysis of the peer training procedure to determine the program components that enhance maintenance of the trainer's skills. Several possibilities exist in this respect including the review of the component steps for each procedure that a staff trainer might perform on his or her own prior to working with a trainee, the instructions the trainer provides to the trainee, and the observation of the trainee's performance (modeling) by the trainer. Finally, the use of a peer training program with other caregiving responsibilities warrants research. For instance, the program may be useful for other emergency skills, other medically related caregiving skills, and behavioral training skills for use with residents. If such a line of research is undertaken, it would be valuable to evaluate the extent to which peer training programs can be conducted by staff without jeopardizing other caregiver responsibilities.

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