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Increasing functional rehabilitation in acquired brain injury treatment: effective applications of behavioural principles

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This paper investigated ways to increase the participation of direct care staff in the functional rehabilitation activities (FRAs) of adults with acquired brain injuries (ABIs). FRAs were rehabilitation agendas written by clinical staff for delivery by paraprofessionals. Increases in FRA completion were believed to be directly related to clinical success. These FRAs had been identified as key components in the rehabilitation programmes of the adults living within the residential facilities. Increases in FRAs were crucial in improving the quality of the rehabilitation programmes of the participants involved. The study observed four residential settings serving adults with ABIs using a multiple baseline design. The treatment approach consisted of public posting of weekly FRA documentation, incorporation of staff input, and reinforcement for documentation of FRAs. The results indicated a positive impact on the participation of staff in all of the residences in the study, consistent with implementation of the treatment package.

Introduction

A common problem observed in many residential settings for persons with disabilities is the lack of functional activity on the part of the participants. General idleness and a lack of purposeful activity are chronic and widespread issues that have been observed in treatment settings for a number of years [1]. Inactivity can lead to health issues, lack of facilitation of rehabilitation agendas, and a lack of initiative. The importance of well-trained staff is underscored even more given that the most basic safety of residential participants in congregate care environments is a direct function of how effectively staff carry out their delineated duties [2]. Effective therapeutic interventions rely on the provision of stimulating activities and social interactions which foster participant learning in a competent, and often effortful, manner [3]. Integrating therapy into the residential rehabilitation setting appears to be one way to address the idleness that is so commonly seen in these environments.

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The provision of a structured set of activities that are functional in nature provides for active treatment and might increase the probability of achieving rehabilitation outcome goals.

Enrolling direct care staff participation in delivery of treatment agendas is crucial to the ultimate outcomes that are targeted in most rehabilitation settings. These outcomes are comprised of increase in personal autonomy, behavioural control, and cognitive gains. The success of behavioural, cognitive, and other discipline specific service delivery depends heavily on the degree to which direct-care staff can understand protocols, implement programmes, and evaluate their performance across a range of treatment protocols. Clearly, then, the delivery of treatment by direct care staff requires careful programming [4].

The importance of direct care staff participation is obvious when one considers typical features of most residential rehabilitation programmes. The clinical staff will often include a nurse, a speech–language pathologist, a behaviour analyst, a physical therapist, an occupational therapist, and a case manager. Yet, these team members are present for a relatively small portion of the day with each participant. In addition, these staff often work in isolation. The clinical staff may communicate their goals to family members and colleagues on the treatment team, but the direct care staff are not often involved in this process to a great extent. While valuable teaching may be taking place during the individual therapy sessions, it is desirable to have the skills taught during these sessions supported and reinforced by direct care staff who spend significant amounts of time with participants.

This broader scope of teaching will only arise if participant–direct care staff interactions are occurring and these interactions are producing constructive, rehabilitation-based activities that reflect the skills taught by the clinical staff. These therapeutic interactions can produce environments where behavioral, language and communication, and independent living skills among others can be taught [5]. Successful incorporation of teaching into the daily routine of direct care staff requires that they understand their role as a liaison between programmatic agendas initiated by clinical staff and the efficient delivery of these programmes to the participants themselves.

By implementing a teaching plan that carefully involves direct care staff, the therapeutic agendas may become more integrated into the lives of the participants and may support a wider range of behaviours [6]. The participants may begin to see these interactions as a natural, functional activity relevant to their future level of independence. Despite the ready availability of such natural teaching opportunities, residential settings are often characterized by relatively infrequent teaching interactions [7]. There are a number of reasons why these teachable moments are not being taken advantage of at therapeutically meaningful levels. Among these are the skill level of the participant and the behavioural risk factors that may be present. The degree of effort required to work with these individuals may at times offset the desire to do so. Some characteristics of the staff may also be impacting performance due to a lack of formal job training or preparation. Another factor that impedes proficient staff performance is the fact that some paraprofessional staff members perceive their job as being limited to providing basic care (bathing or other activities of daily living) or related housekeeping and paperwork chores in contrast to participant rehabilitation activities [8].

Administrative staff as well as clinicians responsible for the successful delivery of services must implement effective management protocols to insure that desired

programmes are being implemented by direct care staff members. Lack of such protocols can lead to uncertainty as to whether innovative programmes will actually reach their intended participants.

Considering that most participants in group settings spend varying amounts of unstructured free time in their residential settings, the availability of trained clinical staff to structure this time is crucial. It is at these times that paraprofessional staff members could be providing participants with opportunities to practice and generalize skills that have been learned in more structured training sessions provided by clinical staff members [8].

The primary agent for increasing participation in rehabilitation activities on a broader scale is the direct care staff member. For many direct care staff, the opportunity to participate in areas that have been perceived to be strictly clinical may be an enticing proposition. There have been a number of documented treatment packages that have targeted improving the behaviour of human service staff [9]. Methods used to promote desired staff behaviour have included providing (a) clear, specific prompts to staff, (b) written or graphic feedback on performance, and/or (c) positive consequences contingent upon staff behaviour. These staff management procedures are consistent with widely held beliefs that staff will perform better under three conditions [10]. These are that they believe their work is important, they feel personal responsibility for their work, and they receive feedback on their performance. Unfortunately, only a few studies have been conducted that have examined the effects of managing staff behaviour in programmes serving individuals with brain injury [11].

The present study used a comprehensive treatment package to increase the number of functional rehabilitation activities (FRAs) that staff engaged in with participants across four residential settings serving individuals with acquired brain injury. The main components of the treatment package were public posting of staff performance, tangible incentives offered for reaching preset weekly goals, and work-related incentives. The purpose was to increase the total number of functional activities that were recorded in each of four residential settings that were investigated. The intent was to positively impact the rehabilitation programmes of the participants living in these residences. An increase in the number of functional activities that were provided was a big factor in achieving this outcome. The more closely that the staff were working with the participants, the more likely the participants were to make improvements in their cognitive, behavioural, and physical rehabilitation process.

Method

Setting

The study was conducted within four residential treatment settings that were part of a post-acute neurobehavioural treatment programme for persons with ABI. Each residence utilized a staffing pool that ranged from 15–20 staff members.

Participants

The participants selected for the study were full-time, part-time, and PRN staff members for each of the residences. The full-time staff members made up ~80% of

the participants, with part-time and PRN staff comprising the other 20% (10% each). The total number of staff members involved in the study was 65. Each of the residences was staffed with an average of three-to-four staff members across three shifts (day, evening, and overnight). The majority of the staff members were hired from the local community. Their ages ranged from 22–47. The ratio of men to women in each residence was 50:50. The staff's main duties were to provide for the care of the participants in the residence as well as to facilitate programmes written by the clinical team.

Dependent measures

The primary dependent measure examined in this study was staff documentation of clinically-generated skills training protocols called Functional Rehabilitation Activities (FRAs). These activities were written in concise, specific formats to allow direct-care staff to assist participants in generalizing the skills that clinicians had been working on in both group and individual therapy. The tasks ranged from reviewing orientation assessments and working on home exercise programmes for physical therapy, to reviewing behavioural incentive programmes. Special care was taken to insure that the protocols were designed to address specific areas of deficit, while at the same time being specific enough to be followed by the direct-care staff. A special form was created to help track documentation of FRAs. The form included which clinical discipline was responsible for generating the FRA, a date of inception of the activity, as well as a narrative section that allowed for documentation of the results of the activity. The form also had sections that allowed both the staff initiating the FRA as well as the participant to sign off, verifying that the activity was completed. There were sections for staff to provide comments that could be utilized to enhance the activity for more efficient and productive delivery of services. There were ~20–25 of these forms in each of the residences monitored in the study. They were included as part of the job for direct-care staff members (see figure 1).

Independent variables

A multi-element treatment package was utilized to impact staff's behaviour with respect to FRA documentation. The components were as follows:

Staff in-service

The experimenters prepared an in-service training that was delivered at a weekly meeting held to discuss issues in the residence and participant progress. The in-service included detailed explanations of what FRA's were and their function in the rehabilitation of the participants who were being served. Specific instruction and feedback were also given related to how a FRA should be documented. In addition to instruction on the importance of FRAs in the rehabilitation process, staff were also given the option of setting initial goals related to the number of FRAs that they felt they could document in their respective houses. Examples were also provided that detailed appropriate documentation of FRAs.

CENTER FOR COMPREHENSIVE SERVICES

FUNCTIONAL REHABILITATION APPLICATIONS

Client:_____ Dates:_____

Task:_____

_____

Accountable Therapist: _____ Use Service Code: _____

DATE	RESULT/BRIEF COMMENT	STAFF INIT.	PART. INIT.

File under:_____ Reviewed by: _____

Figure 1. Functional rehabilitation activities work sheet. Staff fill this sheet out upon completion of clinically-generated activities. The task or protocol would be written in on the sheet. This would direct staff in their completion of the protocol.

Feedback from staff

Prior to the in-service, staff were given a memo that explained the agenda for the meeting. They were also offered an opportunity to provide feedback as to new FRAs that they felt would be applicable for the participants in their residence. These suggestions ranged from methods that they felt were effective in getting participants to participate more in their rehabilitation to improvements that could be made to some of the existing FRAs that had been constructed by clinical staff members. The notion of soliciting staff input was based upon the fact that 80% or more of the time

that the participants spend in the residence was spent with direct care staff members. Their feedback related to compilation of new FRAs was a valuable source of information. The opportunity for input from the direct care staff was made available throughout the study.

Public posting (group feedback)

Each day, a running total of the number of FRAs that were documented in the residence was posted graphically. These graphs were posted in a prominent place which varied across each residence. A goal was set for each week and the staff's progress with respect to that goal was depicted on the graph. Specific notes were placed on the graph indicating individual staff members who made significant contributions to the weekly group effort. Notes were also affixed to the book in which the FRAs were documented, providing praise to staff members for detailed descriptions during these activities. The weekly FRA progress graph had the weekly goal represented by a horizontal line across the page corresponding to that number. Daily progress was depicted using ongoing totals that were posted each day of the week.

The public posting aspect was faded slowly in order to facilitate maintenance of the results. Initially, there were five graphic postings per week during the first 4 weeks of the intervention in each residence. During weeks 5–7, the graphic feedback was faded to three or four public posting per week. After week 8, there were only two public postings per week.

Individual feedback

Individual staff members were given sheets on a regular basis that depicted the exact number of FRAs that they had documented. These sheets were placed in their mailboxes at work. The sheets were also accompanied by 'bonus bucks' or certificates that were provided for each FRA that was done by each staff member. If the group goal for the week had been exceeded, two additional 'bonus bucks' were given for each FRA that exceeded the goal. There were also five 'bonus bucks' provided for attendance to staff meetings. The 'bonus bucks' for exceeding the weekly group goal were discontinued after the intervention had been in place for 8 weeks in each residence.

Bi-weekly auction

An auction was held every 2 weeks that allowed staff to bid on items with the 'bonus bucks' that they had accumulated. In addition to items selected by clinical staff, additional items were made available for the auction. The most popular of these was paid time off and designated blocks of time that clinical staff would substitute for paraprofessionals in the residences performing the job duties of the direct care staff. These were faded to once every 3 weeks after the intervention package had been in place for 4 weeks. The auctions were then faded to once a month after 7–8 weeks of the intervention.

Staff satisfaction survey

A set of questions concerning the elements of the FRA programme was administered to staff. A 5-point Likert-type scale was utilized for each question to indication whether staff strongly agreed to the items presented or strongly disagreed. These were distributed to staff members after the study. The intention was to obtain their input regarding the most salient components of the intervention, as well as to ascertain which parts of the intervention were viewed less favourably. Information from these surveys was utilized to implement the most beneficial features of the intervention once the majority of the intervention package had been faded. The main topic areas within the satisfaction surveys included preferences for the auction, the importance of written vs graphic feedback, and the structure and timeliness of the tasks (FRAs) requested. Participants' views on FRA's and their relevance within rehabilitation programmes were examined, as well as rapport building as it related to FRA tasks (*staff-participant*), rapport building as it related to FRA tasks (*clinical-direct care staff*), and miscellaneous individual feedback. The forms were collected from staff as they participated in weekly house meetings.

Reliability

Two intern students from Southern Illinois University served as reliability observers throughout the course of the study. They would check the daily numbers of FRAs completed at separate times during the week. Their observations were utilized to calculate reliability based upon the number of agreements on weekly frequency of FRA documentation divided by the number of disagreements. This number was then multiplied by 100 to compute a percentage. Reliability measures ranged from 90–95% during the course of the study.

Design

A multiple baseline design across residences was employed [12]. The intervention was introduced in each of the four residences in a sequential fashion. The 'untreated' residences remained in the baseline phase during this sequential introduction of the intervention to determine if the procedures used were producing a change in staff behaviour. The programme was implemented in each of the residential settings for the following number of weeks; Residence 1: 16 weeks, Residence 2: 12 weeks, Residence 3: 9 weeks, Residence 4: 4 weeks.

Baseline

Data were gathered from books in each residence that contained the FRAs for each participant. Weekly frequency counts were provided and reliability was obtained utilizing the procedures described above. This was done to get an accurate accounting of how many of these activities were being documented by staff during this phase of the study.

Intervention

The multi-element treatment package was implemented across each of the four residences within the rehabilitation programme. The initial component consisted of the in-service that was provided to staff in each residence in a sequential fashion. Ongoing feedback concerning new FRAs was solicited from the staff members throughout the course of the study.

Results

Figure 2 shows the frequency of documentation of the FRAs by staff. These numbers were obtained across all four of the residential options mentioned earlier.

The data demonstrate a low and stable baseline across all four of the residences. The staff at Residence 1 documented an average of 5 FRAs per week during baseline. The staff at Residence 2 documented an average of 14 FRAs per week. An average of 0.5 and 5 FRAs were noted at both Residences 3 and 4, respectively.

The intervention was first introduced at Residence 1. The documentation of FRAs increased across all four of the residences after implementation of the intervention package. The staff of Residence 1 increased their average weekly recording to 47.5 FRAs per week after the intervention was started. Residence 2 averaged 70 FRAs per week during the initial stages of the intervention. An average of 80 FRAs were recorded during the intervention phase at Residence 3. There were 120 FRAs for the first week of intervention at Residence 4.

All of the residences set specific weekly goals for FRA documentation. The goals were raised in a step-wise fashion based on the frequency from the prior week and staff's feedback concerning their objectives for the upcoming week.

Week 29 of the intervention phase was significant in that the 'bonus bucks' were discontinued for both Residences 1 and 2. The rate of documentation sharply decreased across both residences as a result. The 35th week of the intervention involved a decrease in the frequency of the auctions from weekly to bi-weekly for Residences 1 and 2. Of interest was that the recording behaviour at Residence 1 increased as a result. The same was not observed at Residence 2, where the recording behaviour remained fairly stable.

Discussion

The data on staff recording of FRA behaviour showed an increase across all of the residences that were included in the study. The increases in the goals that were presented and the subsequent increase in FRA recording indicates a relationship between the intervention and staff behaviour. The public posting, auctions, and individual feedback provided to staff seemed to increase the amount of FRAs that were documented. An interesting feature of the baseline phase of the study is that sporadic increases were observed in all of the residences. All of these appeared to be related to some form of feedback that was given to the staff regarding follow-through on FRA forms. The most interesting phenomenon was the rapid return to zero or near zero levels in the *absence* of this feedback. The question of maintenance of the treatment gains in this study suggest areas of future research to obtain permanence of the behavioural change.

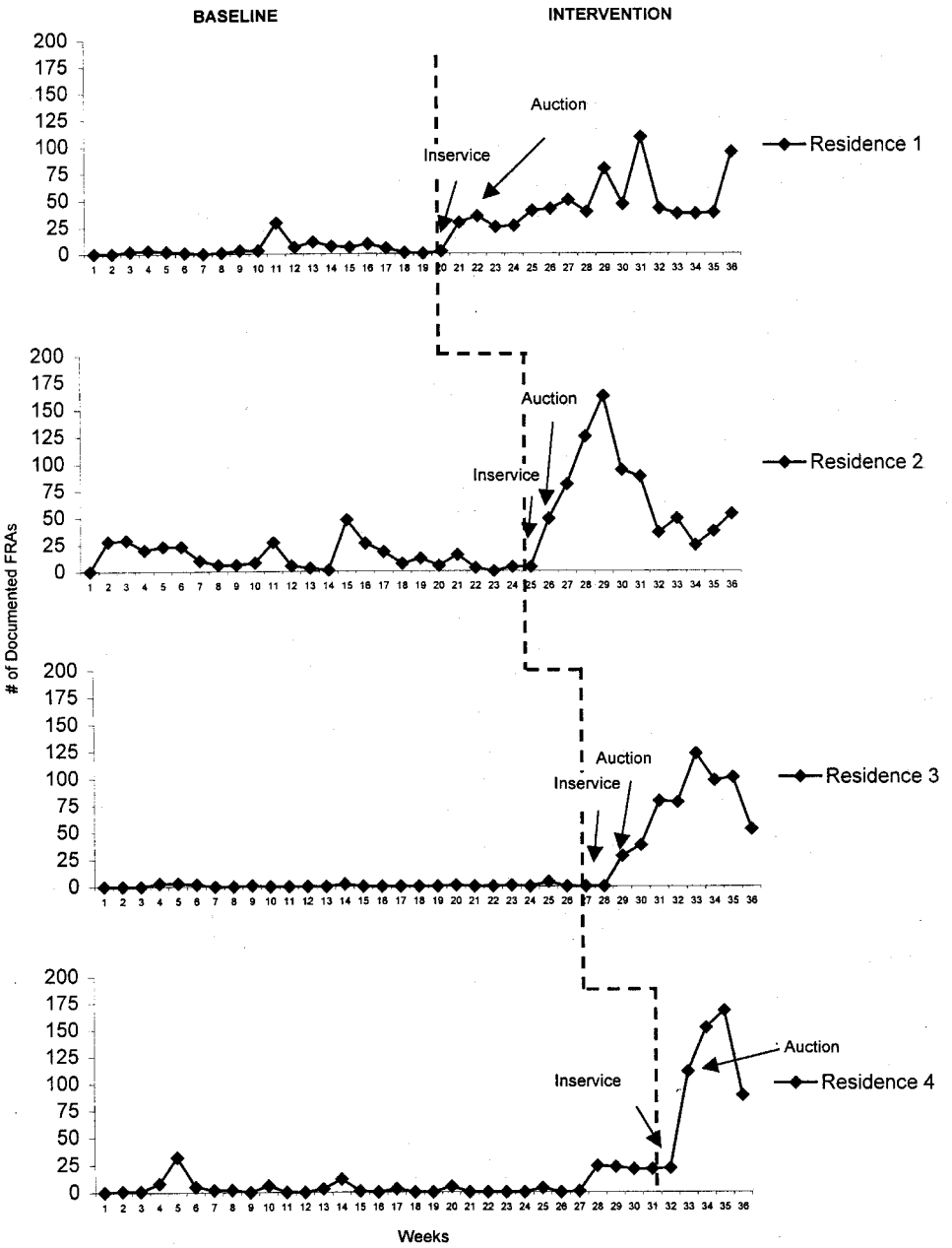

Figure 2. Frequency of FRA documentation across the four residences involved in the study.

In order to build upon the feedback component of the intervention, the involvement of the Residential Supervisor (RS) in each of the residences was crucial to the facilitation of this programme. These supervisors were responsible for all of the staffing and programme maintenance in the residences described. Their role was paramount in that they continued to provide daily feedback to staff regarding their FRA documentation, as well as cueing them as to the status of the publicly posted graph that was hanging in the residence. There were a number of times when the

graphs appeared to lose their ability to prompt and provide visual feedback. This occurred after a few weeks of having them in the office and staff appeared to become habituated to their presence. In addition to the aforementioned verbal feedback provided by the RS, their role in keeping staff motivated and making the importance of the task relevant may have been the most crucial aspect of the intervention. The decreases in FRA documentation noted at Residence 2 in February can be directly related to the absence of the RS at that time. While he was on vacation, the role of providing feedback, public posting, and follow-through was left to clinical staff. Given a host of other responsibilities, the active prompting role did not appear to be present during this time. The numbers were difficult to maintain given the other accountabilities present for the clinical staff members. On two separate occasions during baseline, the Residential Supervisors at both Residences 1 and 2 provided spontaneous feedback to staff during a staff meeting that seemed to impact the data in those two houses. These instances were unplanned and occurred as a result of their job responsibilities. This prompting and feedback did not appear to impact the behavior of the staff at Residence 1. Residence 2 showed an increase in FRA documentation during weeks 13 and 14 of baseline from 1–48 after inadvertent feedback from a supervisor not affiliated with the study. This number quickly returned to baseline levels after this initial spike. The quick return to low baseline levels shortly after the verbal feedback that was observed in both residences is a testament to the ineffectiveness of feedback alone as a behavioural change agent. The second time that this feedback occurred, the data for the staff at Residence 2 showed no change.

The 27th through 30th week of baseline demonstrated an increase in Residence 4's recording of FRAs. This increase may be explained by the presence of a family member who was visiting at the time who encouraged staff to participate in a number of functional activities with his wife. The implementation of novel FRAs during this time period could also account for the changes noted.

The public posting aspect of the project lent itself to a number of variations based on the feedback that was provided to the staff members. These variations included singling out staff members for significant contributions to the weekly FRA total. As time progressed and different criteria were set, it was found to be more productive to highlight the frequency of individual staff's behaviour in order to promote competition. The group seemed to benefit from the performance of a few staff members that worked extra hard. Some 'bonus bucks' were awarded to staff members who documented significantly fewer FRAs than their peers. A pertinent topic for future research in this area would examine the effects of specific criteria that were set for *each* staff member. The present research dealt with group frequencies regardless of individual performance. The authors noted some discontent among certain staff members who reported feelings of being cheated when others were not producing as much as they were. This sentiment was most obvious during the auctions, when all staff benefited from the bonus bucks that were earned by the group as a whole.

Although the auction piece of the treatment package produced a great deal of excitement, it does not appear to be the maintaining factor behind the results that were obtained. Staff appeared to be motivated by earning secondary reinforcers in the form of the 'bonus bucks'. The ability to trade them in for items at the auctions brought a lot of positive attention to the generation of the functional activities targeted in the study. As mentioned earlier, the public posting of results

and cueing provided by the individual Residential Supervisors appeared to contribute to staff performance. A pitfall that was experienced months into the project involved some of these supervisors being assigned different duties that took away from their ability to put as much time into the project as they had. The results were decreases in FRA documentation, even though staff had a very positive response to FRAs in general.

Information gleaned from the staff satisfaction surveys indicated a great deal of satisfaction with the structure of the FRA programme in general. This may have been related to communication that they were crucial to the rehabilitation process of the participant. They also helped to provide structure to the direct care worker's day and feedback from clinicians regarding both FRA documentation and content was deemed very valuable. The most frequent bit of feedback was that the input provided from direct care staff and the value that was placed on this by the clinical staff made a great impact. There was no negative feedback at all. All staff felt that the graphic feedback was instrumental in motivating their behaviour. This occurred due to the goals that were set on the graph as well as the daily progress that was depicted. Another point that was underscored by staff was the need for a more simplified recording form.

There are a number of other research projects that could be pursued based upon the results discovered here. An area of prime interest would be to examine the generalization of these results across different staff tasks. The results obtained here documented increases in staff recording of functional rehabilitation tasks. The results of this study are very promising related to a fuller incorporation of direct-care staff member into the rehabilitation process. When one considers the large amount of time that direct care staff spend with participants in rehabilitation settings, these findings could indicate a new trend for the rehabilitation process. With an increased focus on carrying out clinical rehabilitation agendas on a broader scale, the intent would be a more efficient rehabilitation process as a whole. Future research could examine the impact of these procedures with other staff and participant tasks within a variety of clinical settings. The relevance and ease of implementation of the procedures lends itself to a number of research applications in applied settings. Given the efficacy of the procedures described, their future use could produce a significant impact in the way that residential services are provided to those with acquired brain injury.

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