

Client Adherence to Discharge Recommendations from a Campus Occupational
Therapy Student Clinic

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Abstract

Eighteen adults with chronic medical conditions who participated in a university occupational therapy clinic were surveyed about adherence to home program discharge recommendations. Adherence rates for discharge recommendations that were occupation-based or purposeful activities were compared to preparatory activities, including rote exercise. Reported adherence rates were not statistically different. The study also examined barriers and supports that impacted adherence. Statistically significant negative correlations were found between age and adherence to preparatory activity recommendations and between the number of discharge recommendations and adherence to preparatory activities. In order to achieve better adherence, and therefore improve outcomes, occupational therapists should carefully consider the appropriateness and necessity of every discharge recommendation.

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Occupational therapists routinely make recommendations that require client follow-through outside of the therapeutic setting. Adherence to these recommendations is considered to be critical to successful client outcomes.

Radomski (2011) stated the problem succinctly:

Most occupational therapy intervention approaches involve teaching people strategies (exercises, activities, equipment use, environmental modifications) that enable them to advance their own healing, adaptation, wellness, and quality of life. Patients are rarely “fixed” at clinic sessions. Therefore, even evidence-based occupational therapy interventions and recommendations will be ineffectual if clients cannot or do not adhere to them at home. (p. 472)

In the field of occupational therapy, there is scant research that addresses the question of whether clients are adhering to their home programs. Therefore, in order to examine the issue of adherence, data must be gathered from other disciplines, such as physical therapy, nursing, rheumatology and geriatrics. Studies examined across a broad spectrum of treatments, populations, and recommendations, revealed that clients had varying degrees of adherence to recommendations made by health care providers at the time of discharge. Full adherence is rare. (Chen, Neufeld, Feely, & Skinner, 1999; Kirwan, Tooth, & Harkin, 2002; Wielandt & Strong, 2000).

Lack of adherence has a cost. The World Health Organization (WHO) examined the problem of non-adherence across health disciplines, and found poor health outcomes and increased health costs were associated with non-adherence to treatment recommendations. Furthermore, over the past 50 years, the impact of poor adherence has increased as the disease burden has shifted from acute to chronic diseases (WHO, 2003). Although much of their research was based on adherence to drug regimes, the WHO research included multiple disciplines, suggesting that there are costs and health risks associated with other treatments, such as therapy.

Poor adherence has been attributed to many different factors. One of the most commonly cited barriers is lack of motivation (DeForge et al., 2008; Jack, McLean, Moffett, & Gardiner, 2010; Mitchell & Kemp, 2000). Occupational therapists often recommend occupation-based or purposeful activities to increase motivation. Are clients more motivated to adhere to an occupationally-based discharge recommendation? A thorough review of the literature failed to uncover research on the subject.

Background

A few concepts in this paper have been extensively discussed in the literature. The first is compliance. Sometimes the term compliance is criticized for connoting that health care providers dictate what clients should do (Chen et al., 1999). Other terms that have been suggested are adherence, client cooperation, collaboration, obedience and maintenance (Wielandt & Strong, 2000). In more recent literature, the term adherence has become most prevalent. Therefore, in this

paper, the term adherence will be used to describe how closely clients follow prescribed discharge recommendations.

The second semantic issue involves terms such as purposeful-activity, occupationally embedded, occupation-based, and purpose-filled activity. Historical usage of these terms has not always been consistent. The 2008 Occupational Therapy Practice Framework (OTPF-2) described three types of interventions: occupation-based intervention, purposeful activity, and preparatory methods. In an occupation-based intervention, the client “engages in client-directed occupations that match identified goals” (American Occupational Therapy Association [AOTA], 2008, p. 653), for example, the client completes morning dressing and hygiene using adaptive devices. In purposeful activity, the client “engages in specifically selected activities that allow the client to develop skills that enhance occupational engagement” (AOTA, 2008, p. 653), for example, the client practices how to select and fasten clothing. The purpose of preparatory method interventions is to have the client prepare for occupational performance. For instance, a client may use therapy putty for hand-strengthening exercises. Greater hand strength will help prepare the client for the occupation of morning dressing. In this research paper, the terms occupation-based, purposeful, and preparatory will be used to describe varied types of home program activities, with the definitions established in the OTPF-2 (AOTA, 2008).

A third term that warrants defining is “rote exercise”. As defined by Yoder, Nelson, and Smith (1989), rote exercise involves rhythmically steady repetitions, a high degree of predictability in the environment, no transformation of objects used

(e.g., barbells do not change), a lack of products generated, few environmental cues as to the next step, and self-administration of controlled sensory input with little stimulus change. This type of non-occupation based activity would be considered a preparatory activity according to occupational therapy terminology.

Adherence with general discharge recommendations. Upon discharge, many health care clients receive recommendations from multiple disciplines. Medical doctors, occupational therapists, physical therapists, social workers, and psychologists may all recommend follow-through by the client. In Mitchell and Kemp (2000), 24 geriatric clients were surveyed about their adherence to recommendations made at discharge from a geriatric rehabilitation center. Adherence rates were highest for medical treatments (75%). Adherence with occupational therapy recommendations was 60%. Physical therapy adherence was 53%, and 52% adhered to psychological recommendations. This study had several limitations. Multiple and simultaneous treatments were examined in the study, there were only 24 participants, and clients self-reported their adherence level. The veracity of self-reported adherence to home exercise programs was a limitation, as the literature has shown that self-reported adherence is often inflated compared to actual adherence rates (Forkan et al., 2006).

Adherence to discharge recommendations made by an interdisciplinary team, which included gerontologists, psychiatrists, nurses, nurse practitioners, physiotherapists, occupational therapists, social workers, speech and language pathologists, clinical dietary support, pharmacists, and therapeutic recreation specialists, was examined in DeForge et al. (2008). In this study of 63 geriatric

patients, the mean number of recommendations was 9.4. There was wide variability in adherence rates. Self-report indicated 100% adherence to diabetic management and wound care recommendations. Adherence was high on appointments with doctors (91%) and getting prescriptions filled (91%). Follow-up therapy appointments occurred only 63% of the time. Highest non-adherence rates were for disposing of old medicines (86%), pharmacist review (82%), and use of paratransit services (67%). Although the researchers attempted to establish an association between demographic, physical, cognitive, and hospital-related factors, and adherence to recommendations, they were unable to do so. Diverse and numerous recommendations may have confused or fatigued respondents, weakening the power of this study.

One study was found that focused exclusively on clients' adherence to occupational therapists' recommendations (Furth, Holm, & James, 1994). This study tracked adherence to reinjury prevention recommendations in subjects with upper-extremity work related injuries. Four categories were examined: work simplification, proper body mechanics, therapeutic maintenance techniques, and ergonomic equipment. Recommendations to modify the participant's body mechanics were self-rated as 36% completely adherent both initially and at the four-week follow-up. Implementation of work simplification techniques was 55% complete follow-through initially and 48% at follow-up. Clients cited job demands as barriers to implementing the work simplification and body mechanics recommendations. Therapeutic maintenance recommendations were rated as complete follow-through by 88% of respondents at both the initial and follow-up

reports. Adherence with ergonomic equipment recommendations was 80% initially, and 92% at a four-week follow-up. The increase at the four-week follow-up likely reflected the time required to obtain the equipment. Because this study was conducted with a group of injured workers after completion of an injury prevention program, the results may not be generalizable to most occupational therapy populations.

Adherence with adaptive equipment recommendations. Occupational therapists frequently recommend adaptive equipment for clients at the time of discharge. Kraskowsky and Finlayson (2000) reviewed 14 studies related to aging and adaptive equipment use. All of the studies reviewed dealt with older adults. Many studies tracked rates of use, generally calculated by dividing the number of aids used by the number of aids owned. Overall usage rates ranged from 47% to 82%. Many of the same studies were also included in the literature review by Wielandt and Strong (2000). However, Wielandt and Strong (2000) included studies for a broader range of diagnoses, including chronic conditions experienced by all ages. The review included participants from 2.5 years to 93 years. Usage rates varied even more with the larger review; adherence ranged from 35% to 100%. Bathroom aids and mobility aids were most frequently used as recommended. When considering adaptive equipment recommendations, lack of fit between the person, the environment, and the equipment appeared to be the primary reason for non-adherence with occupational therapists' recommendations. Furthermore, gaps in assessment and training contributed to non-use of prescribed adaptive equipment.

Adherence with therapeutic exercise recommendations. There were few published studies in the occupational therapy literature regarding adherence with home exercise programs for adult clients with chronic conditions. Interdisciplinary studies that include occupational therapists, physical therapists, and other health care providers found approximately 50 - 60% of clients adhered to home exercise programs during the first three to four months (DeForge et al., 2008; Mitchell & Kemp, 2000). The DeForge et al. (2008) study of 63 older adults discharged from a geriatric inpatient facility measured adherence at three months post-discharge. Fifty-nine percent of respondents self-reported full adherence with their home exercise program. In the Mitchell and Kemp (2000) study, 24 clients from a geriatric outpatient facility were surveyed at four months post-discharge. Self-reported adherence to recommendations made by occupational therapy (including adaptive equipment), physical therapy, and psychology were 53 – 60%.

Some studies showed diminished adherence with therapeutic exercise recommendations over time. Iversen et al. (2004) studied 113 patients with rheumatoid arthritis, and found 27% adhered to prescribed exercise programs at a six-month follow-up. Campbell et al. (2001) studied 20 people with knee osteoarthritis and found that continued adherence was based on a complex interplay between the severity of the physical condition, the perceived effectiveness of the intervention (home exercise program or taping), and motivation (including predisposition toward exercise and the ease of fitting the exercise into daily life). Adherence rates in the study were 7/20 (35%) at three months and 5/20 (25%) at one year. Thus, although a majority of people initially adhered to recommendations

(50 – 60%), adherence rates declined over time, with only about 25% adherent one year post-discharge.

Barriers and facilitators to adherence. Study participants cited many reasons for their adherence or non-adherence to home treatment recommendations. The systematic review of 20 high quality studies completed by Jack et al. (2009), reviewed studies that addressed barriers to adherence with physiotherapy recommendations. The evidence indicated that poor adherence was associated with low levels of physical activity at baseline, low in-treatment adherence with exercise, low self-efficacy, depression, anxiety, helplessness, poor social support, greater perceived barriers to exercise, and increased pain levels during exercise. In the previously mentioned DeForge et al. (2008) study, geriatric clients identified barriers as a greater determinant of their ability to follow recommendations than facilitators. Barriers contributing to nonadherence were: the high number of recommendations, complexity of treatment recommendations, lack of time or resources, lack of motivation, and client and caregiver disagreement with recommendations. Additional barriers cited in other studies included: change in health status, involvement in other exercise programs, low levels of physical activity at baseline, low in-treatment adherence with exercise, low self-efficacy, depression, anxiety, helplessness, poor social support, greater perceived barriers to exercise, and increased pain levels during exercise. (Forkan et al., 2006; Petursdottir, Arnadottir, & Halldorsdottir, 2010).

Far more evidence existed in the literature about barriers to adherence than to facilitators. In Forkan et al. (2006), eight barriers were significantly associated

with a decreased adherence to exercise programs, however, not a single motivator was significantly associated with participation. In the DeForge et al. study (2008), the researchers found that adherence was facilitated when the recipient perceived the recommendations as worthwhile, recommendations could be easily incorporated into everyday routines, and caregiver support was good. Petursdottir, et al. (2010) found two types of motivation in their qualitative study of 12 individuals with osteoarthritis: motivation by enjoyment and motivation by results. People who were motivated by enjoyment participated in an activity because it made them feel good during or afterward. People motivated by results participated because they were convinced exercising was good for them. The results of their study indicated that motivation by enjoyment was more effective than motivation by results. Other factors identified as facilitators were an internal locus of control, high self-efficacy, and active coping. Participants who had made exercise a part of their daily routine were more likely to experience good results.

The role of occupational therapy in adherence. Occupational therapists work with the client in a collaborative manner to develop occupation-based goals. “Consequently, occupational therapists shoulder at least some of the responsibility for whether service recipients adopt occupation-enhancing recommendations” (Radomski, 2011, p. 472). In order to achieve desired functional treatment outcomes, a therapeutic program that incorporates meaningful occupation into exercise may appeal to some clients who are not motivated by a traditional therapeutic exercise regimen. Yoder et al. (1989) questioned whether most people were motivated by rote exercise. Rather, Yoder et al. (1989) encouraged clinicians

to make maximal use of the profession's heritage by adding purpose to therapeutic exercises. Haase (1995) asserted that occupationally embedded exercises differentiated occupational therapy from other therapies. Keeping in mind the ultimate functional outcome of all occupational therapy interventions, occupational therapists were encouraged to incorporate purposeful and meaningful activities.

Rote exercise vs. occupationally embedded exercise. Occupational therapists have a long history of encouraging occupation-based and purposeful activities. The earliest practitioners of occupational therapy, Slagle, Dunton, and Barrows, advocated crafts as both ends and means in recovery programs (Trombly, 1995). A 1983 position paper published by the AOTA established purposeful activity as an important tool for occupational therapists to use in developing therapeutic programs. Steinbeck (1986) showed that participants were willing to perform a task significantly longer when it was purposeful with an outcome goal (drilling holes and playing a game) compared to a rote exercise.

Yoder et al. (1989) compared "added-purpose, occupationally-embedded" activities (cookie dough stirring) with "no added purpose" rotary arm exercises with 30 elderly female nursing home residents. They found participants exercised significantly longer when stirring dough. Hoppe, Miller, and Rice (2008) re-created this study with college-aged females as the participants. Results showed significantly more repetitions, longer duration of time, higher levels of happiness, and lower levels of stress and anxiety when students performed the occupationally embedded exercise.

Gaps in the literature. The literature provided evidence that lack of adherence with discharge recommendations was widespread across a broad range of medical fields. Very little research was done in occupational therapy specifically. However, the evidence that existed in occupational therapy showed that adherence rates were sub-optimal in the areas of general recommendations, adaptive equipment usage, and therapeutic exercise. Some studies attempted to identify barriers to adherence, however, there had never been a published study that examined whether clients were more likely to adhere to discharge recommendations if activities were occupation-based, purposeful activity, or preparatory methods. Therefore, the purpose of this study was to compare adherence rates with home program discharge recommendations that were occupation-based or purposeful activity vs. discharge recommendations that were preparatory methods, including rote exercise. A secondary purpose was to obtain descriptive data about barriers that detracted from adherence and supports that enhanced adherence. The population studied was adults with chronic medical conditions who were participants at a campus occupational therapy student clinic in the spring of 2011.

Method

Research Design

A descriptive study was conducted in which participants were asked to self-report levels of adherence with discharge recommendations via an in-person or telephone survey. The independent variables in the study were discharge recommendations in two categories: occupation-based or purposeful activities and

preparatory method activities. The dependent variable was the level of adherence to the discharge recommendations. Follow-up questions were asked about barriers and supports to adherence.

Participants

The population of interest for this study was adults with chronic health conditions who participated in occupational therapy and who received discharge recommendations. A convenience sample of adults with physical disabilities who attended a campus occupational therapy student clinic in the spring of 2011 was used for this study. Occupational therapy services are delivered to clients by student therapists under the close supervision of licensed occupational therapists. All clients who complete the clinic receive discharge recommendations, developed by their student therapist and approved by the clinical supervisor. Clients were included in the current study if they were able to communicate directly with the researcher either in a face-to-face interview or via telephone. Caregiver reports were excluded. Additionally, clients who were discharged without occupational therapy goals either due to leaving the program early or because they had met all goals during the treatment program were excluded. Of the 39 participants in the 2011 spring clinic, 6 were excluded due to early discharge or discharge without goals and 5 were excluded due to communication limitations. Therefore, 28 clients met the inclusion criteria.

Instrumentation

A survey was conducted in person or by telephone, according to the participant's wishes (see Appendix A). After signing a consent form, each discharge

recommendation from the spring 2011 occupational therapy student clinic was read aloud and the participant rated his/her adherence with each one as: *entirely, mostly, a little bit, or not at all*. Follow-up questions were asked to obtain additional information about barriers and supports to adherence to discharge recommendations.

Data for each participant was maintained on an individual data sheet. Information included on the data sheet included a case identification number, age, gender, diagnosis, a listing of discharge recommendations classified as either “occupation based/purposeful activity” or as “preparatory method”, and responses to the survey. Interview responses were recorded on each participant’s data sheet by the researcher. The interviews were not audio or video recorded.

Procedures

In the fall of 2011, prior to developing this methodology, a preliminary file review was conducted. The researcher and the research advisor collaboratively reviewed and classified discharge recommendations from randomly selected occupational therapy clinic files (see Appendix B). A second chart review was conducted of clinic files from 2010 (the year prior to the study) in order to pilot the independent variable classification. Every third file from the 2010 clinic was selected for review, beginning at the first file in the row. Each client was reviewed on the basis of the study inclusion/exclusion criteria. If the client inclusion criteria were met, the discharge recommendations were reviewed against the inclusion/exclusion criteria. Once fifteen discharge recommendations met the inclusion criteria, the researcher provided the research advisor with the list of

discharge recommendations. The researcher and the research advisor independently classified the recommendations as either “occupation based/purposeful activity” or as “preparatory method”. If there had been any discrepancies, changes to the categorical definitions would have been made. No changes were necessary however, as the rater agreement was 100%.

In December of 2011, approval to conduct this study was granted by the university Institutional Review Board (IRB). Once IRB approval was obtained and the consent form and survey instrument were approved, potential participants were contacted by a university faculty member via letter sent through the U.S. Postal Service. All potential participants were asked to return a postage-paid response card indicating willingness to participate or not, convenient contact times, and a contact phone number. If the person agreed to participate, the occupational therapy student conducting the survey was provided with telephone contact information. If there was no response within four weeks, the faculty member attempted to follow-up with potential participants by phone.

Data Analysis

Data were recorded and analyzed using IBM SPSS Version 14 software. Descriptive statistics including frequency counts and percentages were used to gain insight about adherence to discharge recommendations. Correlation and chi square analyses were conducted to determine if there were relationships or differences between groups. Participant comments about barriers and adherence were compiled on a spreadsheet. The statements were evaluated for commonalities. Furthermore, the comments were grouped and re-grouped by respondent’s age,

gender, number of discharge recommendations, and diagnosis. Further consideration was given to the comments in light of these groupings.

Results

Of the original pool of 28 participants meeting the inclusion criteria, 18 completed the survey, a response rate of 64% (18/28). The initial mailing elicited 13 participants, and an additional five agreed to participate after a follow-up phone call from the research professor. Of those not participating, one client had moved with no forwarding information, two clients indicated that they were not willing to participate, one client initially indicated willingness to participate by phone but did not return the mailed consent form, and there was no response from seven clients. Collectively, the 18 respondents had 105 discharge recommendations.

Nine males and nine females completed the survey. Diagnoses represented were cerebral vascular accident (10 participants), traumatic brain injury (2 participants), spinal cord injury (2 participants) and four other diagnoses, each applicable to one participant. The 18 participants ranged in age from 24 to 78 with a mean of 59.8 years ($SD = 13.3$).

Adherence to Recommendations

The number of discharge recommendations given to each participant ranged from 2 to 18 with a mean of 5.83 ($SD = 3.82$). Adherence to the 105 recommendations were: 40% *not at all*, 27% *a little bit*, 12% *mostly*, and 21% *entirely*. Of the total discharge recommendations made, 57 (54%) were classified as either occupation-based or purposeful activity. Forty-eight recommendations (46%) were classified as preparatory activities.

Typical occupation-based or purposeful activity recommendations included incorporating a hemiparetic limb into grooming, toweling down a pet for desensitization to texture, playing games such as checkers to improve scanning techniques, and performing household tasks such as wiping countertops to incorporate therapeutic reaching. Of the 57 occupation-based/purposeful activity recommendations, adherence levels were: 47% *not at all*, 26% *a little bit*, 11% *mostly*, and 16% *entirely*. Typical preparatory activities included range of motion exercises, breathing exercises, therapy putty exercises, and elastic band exercises. Adherence levels were: 31% *not at all*, 27% *a little bit*, 15% *mostly*, and 27% *entirely*.

Comparison of Discharge Recommendation Type to Adherence Level

A chi-square analysis was conducted by discharge recommendation ($N = 105$) to determine whether there was a significant difference between expected frequencies of the dependent responses (*entirely, mostly, a little bit, not at all*) and the observed frequencies when the recommendations were categorized by occupation-based/purposeful versus preparatory activity. There was not a statistically significant association between type of discharge recommendation and adherence level. Adherence to a discharge recommendation was not affected by whether the recommendation was occupation/performance based or preparatory method, $X^2(3, N= 105) = 3.631, p = .304$. Additionally, analysis was conducted using a binary measure of adherence (1= *not at all*, 2 = *entirely, mostly, a little bit*). No statistically significant associations were found in the analysis conducted on the binary measures.

Analysis by Person

Analysis was also conducted by person ($N = 18$), rather than by discharge recommendation. A mean score was calculated for each person by type of discharge recommendation, as well as by total discharge recommendation. On a scale of 1 (*not at all*) to 4 (*entirely*) the mean of the participants' means for occupation-based adherence was 2.12 and for preparatory activity was 2.34, indicating that preparatory activities were adhered to at a slightly higher level. Correlation analysis was conducted to examine relationships between mean adherence for all activities, occupation/purposeful activity, preparatory activities, as well as, age, gender, and total number of discharge recommendations. Two statistically significant correlations were found when comparing each variable to adherence levels. There was a significant moderate negative correlation between age and preparatory mean adherence, $r(16) = -.502, p < .05$. There was also a statistically significant moderate negative correlation between total number of discharge recommendations and preparatory mean adherence, $r(16) = -.587, p < .05$. Both older age and a higher number of discharge recommendations were associated with a lower rate of adherence to preparatory activity recommendations. No statistically significant correlations were found with respect to occupation-based/purposeful activity recommendations or with all recommendations combined.

Barriers and Supports to Discharge Recommendation Adherence

A secondary purpose of this research project was to obtain information about barriers and supports to implementation of recommendation (See Table 1). In the interview, participants were asked "What helped you towards that

recommendation or what kept you from achieving that recommendation?" Many barriers were cited. The most common barrier was that the client did not perceive that the recommendation was appropriate and/or necessary. Inappropriateness was more commonly mentioned when discussing occupation-based recommendations. For instance, one client was to brush her hair, but she had a very short hairstyle; another client was to fold laundry, a task he never performed; and a third client was given reading strategies, but he did not read. Lack of transportation interfered with achieving many community-based goals. Lack of funding limited access to materials, adaptive equipment, and activities outside the home. Other barriers mentioned were lack of family or other support, tight schedules, and complacency or lack of motivation. The most unusual barrier given was that the cat took the therapy putty.

The number of supports cited was far fewer than the number of barriers. Some supports were the converse of the barriers. For example, a friend providing transportation to the gym was cited as supporting adherence. A good match between the client and the recommendation also increased adherence. For instance, one client mentioned that bowling is fun, and he was *mostly* adherent on the recommendation that he participate in Wii bowling. Incorporating the activity into daily life and having equipment readily available supported adherence, such as having a reacher at both the office and another one at home. Other similar examples were getting a splint out of the closet and having the therapy putty right on the table. One client attributed his high level of motivation to intrinsic factors: "When I'm not active and involved, I feel more handicapped."

Discussion

Comparison of Discharge Recommendation Type to Adherence Level

The results of this study did not indicate that discharge recommendations that involve occupation or purposeful activities were adhered to at a higher rate than preparatory activities. While 31% of preparatory activity recommendations were rated as *not at all* adherent, 47% of occupation-based, purposeful activity recommendations were rated *not at all*. On the opposite end of the spectrum, *entirely* adherent performance was also better for the preparatory activities; 27% of discharge recommendations compared to only 16% of the occupation-based, purposeful recommendations. It is interesting to note however, that in the middle rating levels *a little bit* and *mostly*, the percentages were more similar (27% vs 26% for *a little bit* and 15% vs. 11% *mostly* for occupation-based/purposeful vs preparatory, respectively; see Figure 1).

Due to the limited size of the participant group, and the fact that some participants received many more recommendations than others, these results should be interpreted with caution. Specifically, two participants accounted for 17 of the 27 *not at all* responses for the occupation based discharge recommendations. A client with nine *not at all* responses experienced a deterioration in medical condition after discharge, and therefore, she was unable to cook, which was the functional activity targeted. Another participant had eight *not at all* responses for occupation-based recommendations. However, because the sample size was small and the number of recommendations was limited, analysis that excluded these participants from the database did not yield any more conclusive results.

Adherence to Recommendations

Overall level of adherence has been addressed in the literature. In studies previously addressed in the background section, older adults were found to initially adhere to a home exercise program at about 50 - 60%. Adherence deteriorated over time, and by one year post-discharge, it was in the 25% range. In the current study, which was conducted roughly seven months post-discharge, adherence at some level (*a little bit, mostly, entirely*) was 60%. Complete adherence was 21%, relatively close to long term levels found in other studies. Therefore, this current study corroborates the adherence rate of prior studies. It is also interesting to note that adherence rates at this university-based clinic were comparable to the rates found in other studies, despite the fact that the recommendations were made by occupational therapy students and the clinic clients were generally several years post diagnosis and therefore would not typically qualify for funding for occupational therapy services.

Barriers and Supports to Discharge Recommendation Adherence

This study also added to the research base that identified barriers and affordances to adherence. In Forkan et al. (2006), barriers were a better predictor of adherence than facilitators. In the literature reviewed, some of the most frequently included barriers to adherence were change in health status, lack of motivation, and involvement in other exercise programs. In the current study, those three barriers were all mentioned. However, the most frequent barriers mentioned were inappropriate or unnecessary discharge recommendations (9 times), lack of

money (5 times), and inadequate transportation (3 times). One-third of the participants cited either money or transportation as a barrier.

Another finding in the research (DeForge et al., 2008) was that increased age was negatively correlated with exercise adherence. In the current study, age was statistically significantly negatively correlated with adherence to preparatory activity discharge recommendations $r(16) = -.502, p < .05$. Younger participants had higher adherence levels to the preparatory activities. This may be due to a cohort effect that younger people are more accustomed to exercise routines. In fact, “change to a new program” and “lack of time” were the most frequently cited barriers for the younger group, which further underscores a stronger culture of exercise. Older adults more frequently cited barriers such as inappropriateness of the recommendation, lack of money, or lack of support. Another possible explanation for the lower level of adherence for older participants might be that older people have more barriers, such as declines in health due to aging and comorbidities.

A second statistically significant finding was that the number of discharge recommendations negatively correlated with preparatory mean adherence, $r(16) = -.587, p < .05$. Comments made by participants provided insight into why this association was found. Participants cited a lack of time; with a larger number of recommendations, more time was likely required. Additionally, clients sometimes mentioned either not remembering or not understanding the recommendations. This might have been more prevalent with a larger number of recommendations.

Facilitators of adherence cited in the literature as impacting adherence rates included an internal health locus of control, hope of less pain, high self-efficacy, and active coping (Petursdottir et al., 2010). In the current study, none of those factors was specifically mentioned or measured. However, this study did corroborate the findings in DeForge et al. (2008) that adherence was most likely when the recommendation was perceived as worthwhile and could be easily incorporated into everyday routines. The most frequently cited support in the current study was incorporation of the activity or device into everyday life.

Limitations

A convenience sample of people who attended a college based occupational therapy clinic was used. At this point in their recovery, most of these clients would not be funded for traditional occupational therapy services. Additionally, most clients had been involved with the student clinic for several years and consequently had received discharge recommendations year after year. These participants may not be representative of a typical occupational therapy client population; therefore, results of this study may not be generalizable.

No consideration was given as to whether a recommendation had a designated endpoint. In this survey, if the person was not adhering to a discharge recommendation at the time of the survey, he/she was obligated to provide a response other than *entirely*. However, some recommendations were to be discontinued at a certain time or when certain results were achieved. Participants may have reported that they were not adherent to a recommendation because they

were not performing the activity at the time of the study. This may have created some inconsistencies in how participants categorized their adherence.

A further limitation was that the responses to the barrier and support questions could not be attributed to specific occupation-based, purposeful activities or to preparatory activities. Participants answered the questions globally, without specifically addressing each recommendation. On the surface, it appeared that more barriers may exist to occupation-based and purposeful discharge recommendations. For instance, there were greater complications to executing a recommendation embedded in a cooking activity than to executing a recommendation to do five repetitions of an elastic band exercise three times per week. This study did not have a way to extrapolate that data, although possibly the impact was substantial.

Implications for Occupational Therapy

Occupational therapists routinely make discharge recommendations for clients. In order to attain optimal client outcomes, these recommendations must be appropriate and the client must follow-through with them. Although this study did not show that occupation-based recommendations were adhered to at a higher rate than preparatory recommendations, it did clearly point out that people are less likely to adhere to recommendations that they do not consider appropriate. Furthermore, sometimes what makes a recommendation inappropriate is outside of the client's control such as a change in health status or a change in accessible transportation. Therefore, occupational therapists should follow up with clients post-discharge to ascertain if the discharge recommendations are being

implemented and if they are having the desired impact on long-term client outcomes.

One area that occupational therapists do control is the number of discharge recommendations that they give to clients. In this study, for preparatory activities, there was a negative correlation between adherence level and number of recommendations. This suggests that people may be overwhelmed, or they just do not have the time to do a long list of exercises. Occupational therapists should be cognizant of this fact, and selectively recommend preparatory activities that will have the most impact.

Future Research

Due to the previously discussed limitations, it is difficult to ascertain whether the type of discharge recommendation actually does have an effect on adherence levels. A study with a larger sample, a more typical occupational therapy client base, and with data collection nearer to the date of discharge, may have produced more telling results. Improving data collection so that researchers are able to account for activities and exercises that are no longer indicated because of a change in medical condition or accomplishment would make subsequent studies more relevant. Since the field of occupational therapy is based on the belief that occupation is inherently motivating, this additional research would be extremely valuable to the pool of occupational therapy evidence. Research could also be conducted on post-discharge outcomes. Researchers could look at not only adherence to discharge recommendations; they could also look at whether the person is progressing toward the desired occupational outcome. Another interesting study for future research

would be examination of whether follow-up phone calls at various times post-discharge would increase adherence levels to discharge recommendations.

Specifically, what are adherence rates to discharge recommendations at one month, three months, or seven months? These suggested studies could be conducted with qualitative, quantitative, or mixed methodologies.

Conclusions

This study did not find that discharge recommendations that were occupation-based or purposeful activity were adhered to at a higher rate than preparatory activities, such as rote exercise. However, comments made by participants clearly indicated that discharge recommendations that were meaningful to the client were more likely to be followed. Clients did not embrace role changes, but rather they were more likely to adhere to recommendations that fit into current daily activities. Having access to necessary equipment and other resources also improved adherence rates. Conversely, a lack of resources, including transportation and money, were frequently cited as barriers to adherence to a recommendation. Some people were unable to adhere to their discharge recommendations due to a change in health conditions. Age and the number of discharge recommendations were found to negatively correlate with adherence to preparatory activity recommendations. By utilizing the information obtained in this study, occupational therapists can seek to improve discharge recommendations. This will, in turn, improve adherence rates, resulting in better outcomes for clients.

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Appendix A

In-person Survey:

Script: Hello. My name is Nancy Fuller. I am an occupational therapy student at UPS. Thank you for meeting with me today. Before we begin the survey, I would like to explain a little more about the survey and get your consent to participate once you have more information.

(Review the consent form, and have the participant sign the form.)

Then, continue:

In this survey, I will ask you about how well different types of recommendations that you received at the end of occupational therapy clinic last spring worked for you. The information will be used to improve the recommendations that occupational therapy students make to clinic clients in the future.

Last spring, the occupational therapy student who worked with you had X number of recommendations for you. I would like to know whether you implemented each recommendation entirely, mostly, a little bit, or not at all. I will read each recommendation to you separately and then ask for your rating.

Read 1st recommendation. Did you entirely, mostly, a little bit, or not at all do this?

Read 2nd recommendation. Did you entirely, mostly, a little bit, or not at all do this?

Read 3rd recommendation. Did you entirely, mostly, a little bit, or not at all do this?

Etc. if more than three recommendations.

Now, I would like to get a little more detail about your responses.

For #1 recommendation (*paraphrase*), you said that you *responded entirely, mostly, a little bit, or not at all*. Then choose the appropriate question/s. What helped you towards that goal? What kept you from achieving that goal?

For #2 recommendation (paraphrase), you said that you *responded entirely, mostly, a little bit, or not at all*. Then choose the appropriate question/s. What helped you towards that goal? What kept you from achieving that goal?

For #3 recommendation (paraphrase), you said that you *responded entirely, mostly, a little bit, or not at all*. Then choose the appropriate question/s. What helped you towards that goal? What kept you from achieving that goal?

Etc. if more than three goals.

If the participant is having difficulty answering, some of the following prompts may be offered:

Examples of supports:

Previously established routine

Adequate transportation

Healthcare provider or caregiver support

Belief that recommendation is beneficial

Examples of barriers:

the high number of recommendations,

complexity of treatment recommendations,

believe recommendation is not necessary

lack of time or resources,

lack of motivation,

client and caregiver disagreement with recommendations,

change in health status,

involvement in other exercise programs,

low levels of physical activity at baseline,

pain

depression,

anxiety

This completes our interview. Thank you for taking the time to answer these questions. Do you have anything else you would like to add?

Thank you very much.

Appendix B

Classification Examples of Occupational Therapy Interventions from File Sample

Occupation Based	Purposeful Activity	Preparatory Methods
<i>Client engages in occupations that match identified goals</i> (Occupation per OTPF)	<i>Client engages in specifically selected activities that allow the client to develop skills that enhance occupational engagement.</i>	<i>Practitioner selects directed methods and techniques that prepare the client for occupational performance. Used in preparation for or concurrently with purposeful and occupation-based activities.</i>
Swim classes at YMCA (leisure participation)	Purposeful activities using one hand	Hand bike exercises
ride recumbent bike...get footholder, ride when wife is home (leisure participation)	visual skills: play matching, memory or other card games such as uno or spot-it	improve strength of left arm/hand by improving posture
play with grandchildren: puzzles, games, wii (Play participation, family)	penny task: put coins in hand, move penny palm to finger tip, drop in jar, switch hands, repeat	adjust height of laptop screen using mouse and keyboard
do word search games (Leisure participation)	bowl filling activity (fill bowl with water, use sponge to transfer to another bowl)	improve ability to visually scan, remember to look left
play checkers (Play participation. Peer, friend)		Relaxation exercises Trunk exercises exercise strength and function of left arm and hand Stretching and moving exercises
safe and supportive positioning on left side when sleeping (Sleep participation)		
Exclusions:		
Referrals to other health care providers incl. UPS OT/PT clinics	Referrals to recreation groups	Referrals to support groups Caregiver education

Table 1

Supports and Barriers to Adherence to Discharge Recommendations

	Number of times cited by participants		
	Age < 65	Age ≥ 65	Total
Barriers			
Inappropriate or unnecessary	2	7	9
Lack of money	3	2	5
Not motivated	2	2	4
Inadequate transportation	2	1	3
Lack of time	2	1	3
Not supported by others	0	3	3
Started a new program	2	0	2
Supports			
Incorporated into daily life	4	1	5
Pain or fear of disability if don't do it	2	1	3
Have a passion for the activity	1	2	3
Have support from others	1	2	3

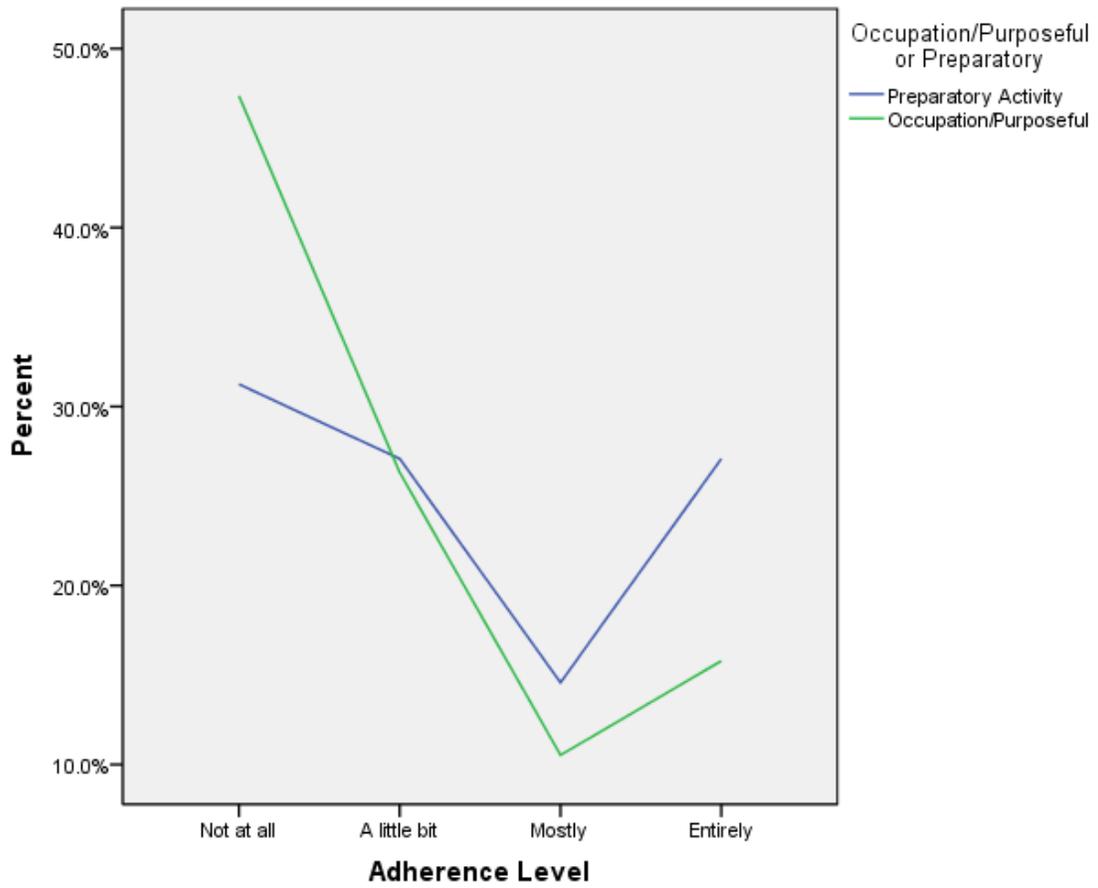


Figure 1. Adherence Level by Type of Discharge Recommendation