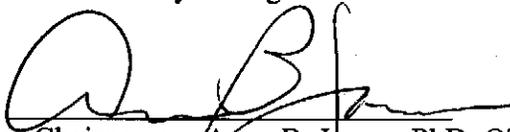


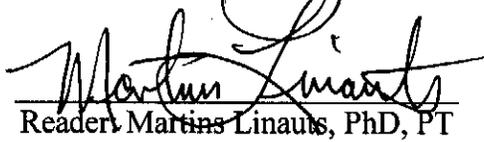
Client Adherence to Discharge Recommendations from an Occupational Therapy Teaching
Clinic Based on Activity Type: Occupation-based, Purposeful, or Preparatory

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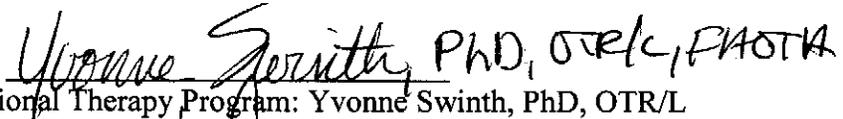
This research, submitted by Jennie White, has been approved and accepted in partial fulfillment
of the requirements for the degree of Master of Science in Occupational Therapy from the
University of Puget Sound.



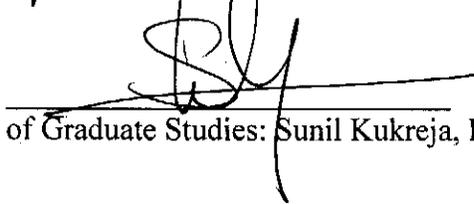
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Abstract

Research has shown full adherence to occupational therapy home program recommendations varies between 40 and 70%. Considering many clients have chronic conditions and are not completely recovered at discharge, this rate of adherence is far less than ideal and has been associated with poor overall health outcomes. Previous research has also suggested that people respond better to activities that have a goal-embedded component than they do to traditional or rote exercise. The current study examined client adherence based on the type of discharge recommendation given to adult clients at an on-campus clinic. Recommendations were categorized into those which were goal-embedded: occupation-based and purposeful and those which did not have a goal-embedded component: preparatory. Adherence rates to occupation-based recommendations had a statistically significant higher adherence than did those that were preparatory. No statistically significant differences were found between preparatory and purposeful or purposeful and occupation-based recommendations. Additionally, facilitators and barriers were examined and discussed, including the appropriateness, feasibility, and likability of a discharge recommendation and how they affect adherence.

ADHERENCE TO DISCHARGE RECOMMENDATIONS

Client Adherence to Discharge Recommendations from an Occupational Therapy Teaching Clinic Based on Activity Type: Occupation-based, Purposeful, or Preparatory

Although occupational therapists' and other healthcare professionals' goal is to allow patients to make the greatest possible gains during treatment, patients are seldom "fixed" upon discharge (Radomski, 2011). There is further potential for healing, a higher level of independence, and increased overall health outcomes. In order to afford clients the ability to continue to make gains after outside of the clinic setting, occupational therapists write home programs.

Home programs are written for clients during treatment and upon discharge. These programs, including therapeutic exercises and activities, enable clients to extend the rehabilitation process while in their natural environments. Unfortunately, research has shown that adherence to home program recommendations is low across the medical arena. According to Christensen (2004), rates of adherence to home regimens among clients with chronic illness range from 40-70%. Studies estimate adherence to home recommendations made by occupational therapists to be in the middle of this range, around 60% (Jette, Rooks, Lachman, & Lin, 1998; Mitchell & Kemp, 2000). The consequence of 40% of patients not adhering to occupational therapy discharge recommendations is extremely costly, not only financially, but also to the long term health of those with chronic disease or permanent disabilities.

Because therapists are not often able to treat clients through the full recovery process and many individuals have chronic disorders and disabilities requiring ongoing therapeutic activities, it becomes important to find methods that will promote client progress after discharge. This can be accomplished by increasing adherence to their home exercise programs. The more clients engage in therapeutic activities, the greater their health outcomes will be (Belza, Topolski,

ADHERENCE TO DISCHARGE RECOMMENDATIONS

Kinne, Patrick, & Ramsey, 2002; Groth, Wilder, & Younger, 1994). They will experience fewer falls and hospitalizations and have better overall body function. Not only will they be more likely to maintain the progress made in therapy, but they also have the potential to make further gains (Belza et al., 2002).

While there are several factors attributed to low adherence, one of the most commonly cited is a lack of motivation (DeForge et al., 2008; Jack, McLean, Moffett, & Gardiner, 2010; Mitchell & Kemp, 2000). Studies in clinical and research settings show that people are motivated to perform better and work harder and longer while doing activities that have an attached goal or purpose as opposed to activities that look more like traditional exercise (Hsieh, Nelson, Smith, & Peterson, 1996; Nelson et al., 1996; Steinbeck, 1986; Yoder, Nelson, & Smith, 1989). If clients respond better to purposeful or goal directed activities in clinic and research settings, it is quite possible that they will also respond better if the same types of activities are recommended to them in their home exercise programs. To date, no studies have been published that examined the impact of type of activity on adherence to home programs. This study sought to examine whether adherence to home program recommendations varied based on the type of activity given to clients discharged from a student occupational therapy clinic.

Background

Home programs are designed by health care professionals in order to support clients' continued recovery outside of therapy sessions. They are sets of recommendations designed to improve health, safety, functional ability, and participation in valued activities (Balkrishnan, Rajagopalan, & Camacho, 2003) and may consist of activities, exercises, adaptations, and modifications that are to be implemented at home or in the community. Clients participate in home programs both throughout treatment and upon discharge from services. These programs

ADHERENCE TO DISCHARGE RECOMMENDATIONS

are written in such a manner that they can be performed independently or with the aid of a caregiver or family member: therefore, they do not typically require direct in-home assistance from a skilled health care professional.

If, upon discharge, occupational therapists can formulate home care programs that consist of activities and attainable goals, home programs may be a cost effective strategy to help the aging, chronically ill, or disabled populations remain as independent and active as possible while safely remaining in their homes for a longer period of time (Balkrishnan et al., 2003; Mitchel & Kemp, 2000). When these programs are strictly followed, clients tend to experience a more successful recovery, maintaining or gaining greater independence in daily activities, remaining in their homes longer, and avoiding unnecessary hospitalizations and the resulting medical fees (Belza et al., 2002; Groth et al., 1994; Mitchell & Kemp, 2000). It is imperative that occupational therapy practitioners design treatment to be as cost effective and beneficial to clients as possible. One such approach may involve the creation and implementation of more effective home programs that engage clients' internal motivation, resulting in better adherence and greater client outcomes.

Adherence to home programs. The terms compliance and adherence have been used frequently in healthcare literature and can generally be defined a patient's level of commitment and follow through with medical or health recommendations (Chen, Nerfeld, Feely, & Skinner, 1999) or an "active engagement in the rehabilitation process" (Groth & Wulf, 1995, p. 18). There is a current view in the medical arena that the term compliance comes with slightly negative connotations, suggesting the client is to blame when recommendations are not followed (Chen et al., 1999; Wielandt & Strong, 2000). In recent years, the term adherence has become more common in the literature, reflecting more active engagement by both provider and patient in the

ADHERENCE TO DISCHARGE RECOMMENDATIONS

creation and execution of health programs. Therefore, for the purpose of this study the word adherence was used, as it is a more neutral term.

Poor adherence to discharge recommendations has been linked to overall health decline, leading to increased hospitalizations and healthcare costs (Belza et al., 2002). Adherence to discharge recommendations, including follow-through with medication administration and management, diet and exercise regimens, and referral services, is less than ideal within many health disciplines (De Forge et al., 2008, Jette et al., 1998, & Mitchell & Kemp, 2000). DeForge et al. (2008) found that clients discharged from geriatric rehabilitation adhered to discharge recommendations at varying rates based on the recommendation category. The greatest level of adherence was found in the category of equipment recommendations where 80% of clients showed adherence. With regard to the category of home exercise plans, 59% of clients reported full adherence to recommendations, while 31% reported partial and 10% reported not doing any of the recommended home exercises (DeForge et al., 2008).

Similarly, Mitchell and Kemp (2000) studied a group of 24 elderly clients upon discharge from an outpatient clinic. Four months post discharge, clients were interviewed via telephone regarding their adherence to recommendations made in the following categories: psychological, medical, occupational therapy, and physical therapy. While Mitchell and Kemp (2000) did not define how often or for what duration clients needed to participate in a recommended activity to be considered adherent, they found clients did not engage in the discharge recommendations at the ideal rate of 100%. The participants had the greatest adherence to medical recommendations (75%). Occupational therapy recommendations ranked second with an adherence rate of 60%, followed by physical therapy at 53%, and psychological recommendations at 52%. Other studies have found adherence to discharge recommendations and home regimens made by occupational

ADHERENCE TO DISCHARGE RECOMMENDATIONS

therapists and physical therapists to range from 40% to 70% (Belza et al., 2002; Christensen, 2004; Jette et al., 1998). While occupational therapy appears to have higher levels of patient adherence than many other medical professions, the gap between the current level of adherence and an ideal level is far too large, and the associated risks of non-adherence too high. Examining systematic approaches within the field of occupational therapy to increase levels of patient adherence to home programs would enhance client outcomes.

Several studies have explored the reasons why clients do not have a high success rate in following discharge recommendations and examined ways to increase overall adherence by eliminating existing barriers. Jack et al. (2010) reviewed several studies on physiotherapy discharge recommendations. They cited lower levels of physical activity before treatment, depression, low self-efficacy, increased pain, and minimal social support as barriers to adherence. Conversely, high internal motivation typically found in those with high self-efficacy, a higher satisfaction with life, and increased social support has been associated with higher adherence rates and serves as facilitators (Mitchell & Kemp, 2000; Tannenbaum, Bachand, Dubeau, & Kuchel 2001).

Researchers have suggested that clients are more likely to follow home programs if they perceive the recommendations to be useful and worthwhile (Belza et al., 2002; Bogardus et al., 2004; Campbell et al., 2001; Robinson, 1987). These studies also found that clients participated more when they were able to fit their new therapy recommendations into their daily routines, making them less burdensome. Traditional exercise, often termed rote exercise in rehabilitation literature, may be perceived as cumbersome, boring, and/or an added time-consuming chore. Perhaps clients have trouble seeing a direct connection between rote exercise prescribed by their therapists and their long-term goals. If this is the case, clients may find a greater sense of

ADHERENCE TO DISCHARGE RECOMMENDATIONS

meaning in therapeutic activities and home recommendations in which they find purpose and will, therefore, be more likely to actively engage in them. In the field of occupational therapy these therapeutic activities would be described as either purposeful or occupation-based.

Types of therapeutic activities. There are three types of therapeutic activities utilized in the field of occupational therapy and described in the American Occupational Therapy Association's (AOTA) Occupational Therapy Practice Framework: Domain & Process (OTPF): preparatory methods, purposeful activities, and occupation-based interventions (AOTA, 2008). In occupation-based interventions, clients engage in and practice the actual activities included in their goals in order to engage more independently in that occupation (AOTA, 2008, p. 653). Occupation-based treatment can also lead to improvement in the underlying factors affecting performance in the activity such as strength, coordination, range of motion, endurance, cognitive capacity, or habituating compensatory strategies needed for successful task performance. Such improvements in these factors can be carried over to improve functioning in other desired occupations.

The second type of intervention utilizes purposeful activities in which a "client engages in specifically selected activities that allow the client to develop skills that enhance occupational engagement" (AOTA, 2008, p. 653). For example, a therapist may have a client practice a part of an activity, such as opening jars or arranging items in a cupboard, as opposed to cooking a full meal, which would be considered an occupation-based intervention. Another example of a purposeful activity might involve a client standing for ten minutes while playing Wii Tennis in order to increase the client's endurance, standing balance, and range of motion to the level required for cooking a whole meal.

The third intervention strategy available to occupational therapists is the use of

ADHERENCE TO DISCHARGE RECOMMENDATIONS

preparatory methods, in which a “practitioner selects directed methods and techniques that prepare the client for occupational performance” (AOTA, 2008, p. 653). Methods under this category include activities typically perceived as “traditional” exercise and are often referred to as rote exercise in rehabilitation literature. Preparatory methods include activities, such as stretching, strengthening and endurance-training through the use of exercise machines, weights or repetitive physical movement. Yoder et al. (1989) described rote exercise as being a series of steady, rhythmic repetitions involving objects that are rarely transformed and lacking in a final product. Examples of rote exercises prescribed in home recommendations include the use of therapy putty, dumbbells, elastic exercise bands, exercise balls, dowels, or the use of one’s body to perform repetitive movements in order to increase strength and endurance.

While the OTPF separates therapeutic intervention strategies into three types: preparatory, purposeful, and occupation-based, rehabilitation literature, including occupational therapy specific literature, has not used these three terms in ways that directly correspond to the OTPF’s definitions. Other fields use different terms to describe these types of activities, and much of the occupational therapy literature predates the OTPF. Therefore, in the literature, purposeful activities have been described using the following terms: goal-embedded, purpose-added, purpose-filled, occupation-based, and occupationally-embedded. Activities without a goal-embedded component have been referred to as rote or traditional exercise in the literature, which are consistent with the OTPF’s definition of preparatory methods. No published research reviewed for this study was found that examined occupation-based activities, as described in the OTPF. The literature reviewed compared performance outcomes of activities that were consistent with the current OTPF definition of purposeful with activities the OTPF would define as preparatory methods. For this study, therapeutic activities will be separated into three categories,

ADHERENCE TO DISCHARGE RECOMMENDATIONS

as opposed to only two as seen in previous research, and the terms preparatory, purposeful, and occupation-based will be used, as they are the official terms used by the AOTA (AOTA, 2008).

Performance outcomes based on activity type. In research and clinic settings, purposeful activities have been shown to produce better results than rote exercise when the following dependent variables were measured: number of repetitions performed (Hsieh et al., 1996; Lang, Nelson, & Bush, 1992; Yoder et al., 1989), level of perceived exertion during and upon task completion (Kircher, 1984; Steinback, 1986), active range of motion while performed (Nelson et al., 1996; Sietsema, Nelson, Mulder, Mervau-Scheidel, & White, 1993), and duration of engagement (Steinbeck, 1986; Yoder et al., 1989). For example, Yoder et al. (1989) found that elderly females without a specific diagnosis performed more exercise repetitions when an added-purpose exercise of stirring cookie dough was asked of them than did participants in the same study who were asked to perform a physically comparable rote exercise. The results found by Yoder et al. (1989) suggest that purposeful activities may aid in increased performance results on specific task variables. Likewise, in a study examining dynamic standing balance, participants performed more repetitions when the activity involved leaning over to pick up balls and tossing them at targets than when participants in another group performed rote exercise involving bending and reaching motions (Hsieh et al., 1996). The literature suggests that an activity involving an attached purpose or goal seems to either offer a distraction for participants, enabling them to perform longer before feeling a high level of exertion, or is a more stimulating task providing participants with more motivation for persisting longer or working harder, at least in clinical settings (Hsieh et al., 1996; Kircher, 1984). Furthermore, Kircher (1984) and Steinbeck (1986) similarly found participants worked harder (i.e. performed more repetitions in less time) when given a task with even a seemingly small purpose than they did doing purely rote exercise.

ADHERENCE TO DISCHARGE RECOMMENDATIONS

Previous studies have suggested there is a difference in performance on specific tasks based on the structure and type of activities. These studies, however, were carried out in a clinical situation, on a one-time basis and participants did not have chronic medical conditions. At the time of the literature review, no study had been published that examined this concept of improved performance based on activity type in actual patients receiving home program recommendations. Perhaps if therapists designed home programs using the same concepts as the previously cited studies, using more purposeful or even adding in occupation-based recommendations instead of rote exercise characteristic of preparatory methods, they may have found better adherence rates. Designing a therapeutic activity that fits easily into the client's daily routine may also make the activity less burdensome and perceived as more worthwhile. Additionally, clients may enjoy these types of activities, seeing them as more applicable to their daily lives or even fun to perform. These benefits may be less likely with traditional rote exercise.

Most of the research reviewed for this study focused on overall client adherence with limited attention to examining whether or not the type of intervention impacts clients' levels of adherence. Fuller (2012) completed an unpublished study to investigate client adherence to discharge recommendations made at a student-run occupational therapy clinic. She examined differences in client adherence to recommendations that were either purposeful or occupation-based compared to those that used preparatory methods. While there were no statistically significant differences in adherence rates based on type of intervention activity, Fuller (2012) revealed three findings worth noting.

First, the most frequent barrier to adherence, cited by one third of the participants, was a perceived inappropriateness of the discharge recommendation. Participants stated that the

ADHERENCE TO DISCHARGE RECOMMENDATIONS

recommendations did not help them reach their goals, were too difficult to perform, or were not meaningful to them. This suggests that student therapists and participants differed in their perceptions of a “good fit” between clients’ needs and the recommended program. Second, participants also reported lack of money and transportation as common barriers to adherence with discharge recommendations. Third, participants cited difficulty in fitting recommendations into their daily routines as a common reason for lack of adherence.

The perceived appropriateness and feasibility of the occupation-based and purposeful recommendations may have been intervening variables that impacted adherence to occupation-based and purposeful activity, rather than the intended variable of type of activity. Another limitation Fuller (2012) reported was that she received data from participants regarding their overall satisfaction with the entire home program, however, she did not ask follow up questions specific to each discharge recommendation, limiting her ability to interpret the data. She was not able to discern what specific recommendations clients perceived as more helpful than others. Finally, clients who were unable to perform a recommendation due to hospitalization or significant change in health status were counted as being non-adherent, and those who were no longer performing the activity due to goal attainment were also classified as non-adherent. The current study replicated Fuller (2012) using a modified research design intended to address several of its limitations by asking for additional information regarding each recommendation as opposed to the home program as a whole.

The purpose of this study was to determine whether adult clients seen at an on-campus occupational therapy student clinic had different levels of adherence to appropriately prescribed occupation-based interventions, purposeful activities, or preparatory methods included in their discharge home programs. As Fuller (2012) found barriers to adherence that are not well studied

ADHERENCE TO DISCHARGE RECOMMENDATIONS

in the literature, this study further investigated possible barriers to adherence for each type of intervention to help occupational therapists create home programs that facilitate adherence.

Method

Research Design

A mixed research design was utilized in this study. Quasi-experimental quantitative methods were used to compare self-reported levels of adherence to three different types of home program recommendations made upon discharge. The independent variables were the type of discharge recommendation: preparatory methods, purposeful activities, and occupation-based interventions. Level of adherence to each recommendation was the dependent variable. Qualitative methods were used to further examine supports and barriers to adherence.

Participants

The population for this study was a group of adult clients with chronic disabilities who received occupational therapy services and home program recommendations upon discharge. A convenience sample of 22 potential participants was obtained from an onsite teaching clinic at the University of Puget Sound in Tacoma, Washington. Clients ranging in age from 33 to 76 years received weekly services in the spring of 2012. In order to qualify for the study, participants had to meet the following inclusion criteria: 1) had health limitations impacting occupational performance that could be addressed by occupational therapy services, 2) had attended clinic and been discharged by the treating student therapist, 3) been provided with written home recommendations to be performed independently, i.e., not by a caregiver. Participants were excluded from the study if they received additional occupational therapy services outside of the on-site teaching clinic at the time of their treatment or experienced a change in health status after May 2012 that impacted their ability to adhere to all discharge

ADHERENCE TO DISCHARGE RECOMMENDATIONS

recommendations. Each participant had his or her own student therapist and received individualized therapy and home recommendations. Occupational therapy students under the supervision of licensed occupational therapists provided the occupational therapy services, including home programs, to participants in this study.

Instrumentation

A 30-minute survey (see Appendix) was conducted with each participant, either via the telephone or in person. The survey, created by the researcher and reviewed by the research advisor, consisted of the reading of each discharge recommendation to the participant, asking if the activity was performed entirely as recommended, mostly, a little bit or not at all. The survey consisted of 10 follow up questions, some open ended in nature, regarding possible facilitators or barriers influencing adherence to each discharge recommendation.

Procedures

After approval was granted by the university's Institutional Review Board (IRB), the researcher categorized 2012 client charts into two groups: those attending the 2013 clinic and those not attending. Clients not returning to the 2013 clinic were mailed a letter from the research supervisor, which briefly explained the study and asked if they were willing to be contacted by a student to participate in student research. Along with the letter, two consent forms, one to be kept by the client and one to be returned, a response form for contact information, and a pre-stamped return envelope were included. The researcher reviewed the charts of clients who had returned to the clinic in 2013 to find out who gave signed consent to be contacted for student research and called potential participants to describe the study and invite them to participate. All clients who expressed interest in participating in the study and also met the criteria for the study were enrolled. All participants were given the option to take the survey

ADHERENCE TO DISCHARGE RECOMMENDATIONS

over the phone or to meet in person.

The researcher reviewed each participant's chart. Basic demographic data for each participant, including age, diagnosis, living situation, and number of semesters they attended the on-site teaching clinic were obtained from the charts. Discharge recommendations were classified as preparatory methods, purposeful activities, or occupation-based interventions. Recommendations that did not require the clients' ongoing, active engagement, for example, recommendations for the purchase of adaptive equipment or referral for other services, were not included in the study. The research advisor conducted a random chart review of five participant files to ensure the researcher properly categorized discharge recommendations. Any discrepancies were discussed and reclassified.

Prior to data collection, the researcher conducted a practice phone survey in order to gain information regarding duration and format. The principle investigator conducted all surveys in order to maintain consistency. All participants were given identical surveys, and the researcher read all questions in an identical order from a formal script.

Quantitative raw data from each survey were entered into the IBM SPSS Version 19 statistical analysis software program. A peer review of the data entered into the computer program was performed in order to ensure reliability. Qualitative data were typed into a Word document and analyzed separately.

Data Analysis

Descriptive statistics were used to analyze demographic data, including age range, mean age and standard deviation of participants and the percentage of each gender, race and diagnosis represented in the sample population. The total number of discharge recommendations given to the 18 participants was found, along with the number of recommendations deemed appropriate

ADHERENCE TO DISCHARGE RECOMMENDATIONS

and adherence to each recommendation type. Fuller (2012) found that including recommendations deemed inappropriate by participants limited her ability to analyze if certain types of recommendations would result in higher adherence. For this study, recommendations that participants reported they had completely forgotten about or that they deemed inappropriate were removed from the quantitative analysis of adherence to recommendation type, as they may have presented an intervening variable. Recommendations were determined by participants to be inappropriate if they were too hard or too costly to be carried out or did not match their goals. A chi-square analysis was run to determine if the distribution of adherence levels was different than expected for the three types of recommendations. A post hoc Mann Whitney U test was performed to determine if there were differences in mean levels of adherence between each recommendation type. The comments made by participants on the follow-up questions were reviewed and categorized as facilitators or barriers to adherence.

Results

From the original pool of 22 clients meeting the inclusion criteria, 18 (81.8%) participated in the study. Of the four non-participants, one client declined to participate, two did not respond after several attempts to make contact, and one relocated without leaving a current phone number or address. The 18 participants ranged in age from 33 to 76 with a mean age of 60.8 years ($SD = 10.18$). Twelve males (66.6%) and six females (33.3%) completed the survey. Seventeen of the participants were White and one was Asian American. Twelve of the participants (66.7%) had attended the on-site clinic in 2011, and six of the participants (33.3%) had not attended the year prior, making 2012 their first year at the school receiving occupational therapy services and subsequent discharge recommendations from the on-site clinic. Participants received services for the following diagnoses: cerebral vascular accident ($n = 11, 61%$),

ADHERENCE TO DISCHARGE RECOMMENDATIONS

traumatic brain injury ($n = 2$, 11%), Parkinson's disease, osteoarthritis, multiple sclerosis, brachial plexus injury, and spinal cord injury ($n = 1$ each, 5.5% each). Ten surveys were given in person, and eight were given over the phone.

Adherence to Recommendations

A total of 75 recommendations met the review criteria for the study and could be classified as occupation-based, purposeful, or preparatory. Of these 75, 54 were appropriate recommendations and remembered by participants and were used in the analysis of adherence by recommendation type. Numbers and percentages relating to the 75 recommendations meeting the review criteria, along with the 54 used in the analysis are shown in Figure 1. Levels of general adherence to recommendations used in the analysis are also included in Figure 1. Twenty-two (29%) of the total 75 recommendations given were adhered to *entirely*. Twenty-six (35%) were not performed at all.

Examples of preparatory recommendations included in the analysis are pulling pennies out of therapy putty, wall squats, trunk exercises, and shoulder self-range of motion exercises. Purposeful activities given to participants included: using a weekly calendar to track responsibilities, playing computer games to increase cognition, using word searches to increase scanning ability, and using joint protection strategies while cooking and reading. Some examples of occupation-based recommendations provided to participants were journaling, meal planning and preparation, housekeeping tasks, and sending correspondence via email.

Comparison of Discharge Recommendation Type to Adherence Level

Adherence levels for each recommendation type are shown in Figure 2. A chi-square cross tabulation was run to determine if there was a statistically significant difference in the distribution of the frequencies of each dependent variable (*not at all, a little bit, mostly, entirely*)

ADHERENCE TO DISCHARGE RECOMMENDATIONS

across each independent variable (recommendation type) than expected by chance. A statistically significant difference in distribution of frequencies of adherence across recommendation type was not found, $X^2(6, N = 45) = 9.562, p = .144$. A power analysis was performed to determine the likelihood of a type II error. The effect size, omega (ω) was .42, indicating a medium to large effect (Tomita, 2006, p. 247). A power analysis for chi-square, with $p = .05, df = 6$, resulted in a power of .61 (Cohen, 1988, p. 237). In order to meet a power of .80, 80 recommendations were needed in the analysis.

Three post hoc Mann-Whitney U nonparametric tests were used to compare the mean ranked distributions of each of the three categories to one another separately to see if there were significant differences between any two categories. While there was no statistically significant difference between preparatory and purposeful recommendations and purposeful and occupation-based, a difference was found between the mean rank distribution of adherence when comparing preparatory recommendations to occupation-based, $p = .016$.

Analysis of Adherence to Recommendation Type by Person

Analysis of adherence was also conducted by person ($N = 18$). This analysis was performed in order to examine the possibility that a participant having received a large number of recommendations in a particular category may have skewed the analysis by recommendation type. With this analysis, each participant's reported levels of adherence for each activity type received the same weight as all other participants' levels of adherence. In this analysis, the mean score for each person's adherence to each of the three recommendation types using the following scale: 0 (*not at all*), 1 (*a little bit*), 2 (*mostly*), 3 (*entirely*). As only two participants received all three types of recommendations, there were not enough data points to compare all three recommendation types to each other. Purposeful and occupation-based recommendations were

ADHERENCE TO DISCHARGE RECOMMENDATIONS

combined into a single group because they both carry a goal-embedded component. The goal-embedded activities were then compared to preparatory methods. Sixteen of the eighteen participants received preparatory recommendations and eleven participants received a combination of purposeful and occupation-based recommendations, therefore sixteen means for preparatory recommendations were calculated and eleven means for the goal-embedded recommendations were calculated. Seven participants only had a mean score for preparatory recommendations, while only one participant had only a mean score for the goal-embedded category. The mean level of participant adherence to preparatory methods was 1.75; where as the mean level of adherence for the goal-embedded recommendations was 2.21. A Mann-Whitney U test failed to find statistically significant differences in mean adherence by person between groups, $p = .055$.

Facilitators to Adherence

Follow up questions for each recommendation were asked of each participant in order to explore facilitators and barriers to adherence (see Appendix). The researcher used a descriptive approach to analyze the data, looking at frequency of participant responses to each follow-up question (see Table 1). Responses to the feasibility of recommendations varied by participant and recommendation type. The recommendations that were perceived as easy or somewhat easy to fit in tended to have a higher adherence rate. Of the 16 recommendations adhered to *mostly*, 13 were reported to be somewhat or very easy to fit into a daily routine. Of the 22 recommendations adhered to *entirely*, 19 were reported to be either somewhat easy or easy to fit into a daily routine. Some participants cited preparatory methods as being easy to fit into their schedules because they could complete them while doing other activities, such as waiting for the bus, lying in bed, or watching television at night. Others perceived purposeful or occupation-based

ADHERENCE TO DISCHARGE RECOMMENDATIONS

recommendations as easier to fit into their lives because they involved common household tasks such as meal preparation, laundry, and pet care or were perceived as leisure activities, for example, playing on the iPad, emailing, doing word searches, or playing dominos. When asked about the feasibility of occupation-based recommendations two participants' responses were, "Well, everyone has to eat" and "I've always done them so it was great to find a way to get back to being me." Eleven of the thirteen occupation-based recommendations were considered somewhat easy or very easy to fit into their routines.

Participants were also asked the open-ended question of what they liked or disliked about the activity/exercise. Of those who reported adherence to be either *mostly* or *entirely*, common responses to the question focused on a perceived benefit and/or level of enjoyment. Of those adhering to a recommendation *entirely* or *mostly*, the following explanations were given: "It gives me independence; lets me be me again," "It's satisfying and relaxing," and "It gives me confidence and decreased pain." Other facilitators to adherence reported by participants were receiving a visual aid, written instructions, and explanation of the benefit of the recommendation.

Barriers to Adherence

The most commonly reported barrier to adherence was that participants forgot a recommendation entirely. The second most common barrier was participants did not do activities they perceived as inappropriate for them. Of the total recommendations given, 25% of all preparatory methods were forgotten by participants and 33% of occupation-based recommendations were perceived as inappropriate by participants because they felt they were either too challenging or did not match their goals. Participants also cited receiving too many recommendations as a barrier. Three participants who forgot about a recommendation gave having too many recommendations as a reason they forgot. One client who forgot to carry out

ADHERENCE TO DISCHARGE RECOMMENDATIONS

one of his recommendations suggested, “Therapists should practice the important exercises with clients that they will assign them in their home programs while they are in clinic. That way upon discharge the exercise will be easily remembered and will already be a habit.”

Of the recommendations included in the analysis of adherence by type, three participants cited low adherence to a recommendation as the result of having too many recommendations. Participants explained that over the course of their condition, they have seen several occupational therapists, physical therapists, and speech therapists and have been given home program recommendations by each. Several participants indicated that they pick and choose the activities they enjoy doing or believe have the most benefit. Two reported attending the physical therapy student clinic at the school several months later and were currently participating in the physical discharge recommendations instead. Of those participants reporting adherence levels to be *not at all* or *a little bit*, four reported the recommended activity was boring and/or unpleasant; all were preparatory methods. No participants cited pain as a barrier.

Discussion

Levels of Adherence by Recommendation Type

This study was the first of its kind to look at the differences in adherence rates based on types of activities as described in OTPF. While research has found differences in performance outcomes between goal-embedded and non-goal embedded activities, this study sought to separate goal-embedded activities into either purposeful or occupation-based interventions and compare adherence rates of the two groups to each other and to preparatory methods. The results of this study suggested that occupation-based recommendations were adhered to *entirely* at a much higher rate than preparatory recommendations. There was not statistical significance found between occupation-based and purposeful interventions or purposeful and preparatory

ADHERENCE TO DISCHARGE RECOMMENDATIONS

interventions.

The results of higher adherence to occupation-based recommendations over that of preparatory reinforce occupational therapy's founding ideology, suggesting that people will be more persistent in performing activities that they feel has an attached meaning or goal. With occupation-based recommendations, clients are therapeutically engaged in an activity that is also a meaningful goal. As stated in the literature, people tend to work harder and perform longer when an activity has an attached goal because the goal provides a purpose and often a distraction from the work (Hsieh et al., 1996; Yoder et al., 1989). In line with the literature, participants in this study engaged in recommendations more often that matched a goal. They reported these activities as enjoyable and did not perceive this type of recommendation as work. While the literature has only measured short-term performance outcomes by type in research and clinical settings, this study found that there is a difference in performance outcomes as measured by longer-term adherence rates to home programs.

Although previous research suggests that purposeful activities produce better outcomes on specific tasks than does rote exercise, significant results between purposeful and preparatory recommendations were not found in this study. Perhaps when clients in the 2012 occupational therapy clinic were assigned purposeful activities for home recommendations, they did not see how the activity related to an end occupational goal. With purposeful and preparatory recommendations it may be more difficult to see how the activity directly relates to the long-term goal unless explicitly explained by the therapist. Those participants who had highest adherence to preparatory and purposeful recommendations stated that they could understand or perceive a benefit from performing the activity and typically had received written information and/or a visual aid explaining the activity's purpose. A commonly cited barrier to general adherence was

ADHERENCE TO DISCHARGE RECOMMENDATIONS

that the explanation of the recommendation was not in-depth enough to be well understood or that it did not match a goal. This suggests that when giving home recommendations, it is very important that the therapists explain the link between the recommendation and its impact on the long-term goal. Otherwise, the client may think the recommendation does not fit with his or her needs and may not engage in the activity.

Another possible reason a significant difference was not found in adherence levels between purposeful and preparatory recommendations may be the result of a small number of purposeful recommendations used in the analysis. The power analysis of the chi-square demonstrated that the power for this study was low, indicating a higher than acceptable risk for a type II error. This means that with the number of recommendations included in the analysis (54), the chance that the null was supported in error was 39%. For a more accepted power of .80, the total number of recommendations included in analysis would have needed to be 80. Even though full adherence to purposeful recommendations was twice as high as the adherence levels to preparatory recommendations, the power of the study may not have been large enough to produce a statistically significant result.

Barriers and Facilitators to Adherence

Literature has revealed overall adherence rates to recommendations provided by healthcare professionals to be far less than ideal. Full adherence to occupational therapy recommendations has been found to be between 40 and 70% (Belza et al., 2002; Christensen, 2004; Jette et al., 1998). Participants in the current study reported overall adherence rates to be slightly lower than those reported in the literature. However, of the recommendations remembered and perceived appropriate, overall full adherence was about 50% and at least *mostly* adherence to at a rate of 71%. This suggests that when participants remembered

ADHERENCE TO DISCHARGE RECOMMENDATIONS

recommendations and found them to be appropriate, they were likely to adhere. Clients are likely to adhere to recommendations they perceive as useful, worthwhile, and easy to fit into their lifestyle (Belza et al., 2002; Bogardus et al., 2004; Campbell, et al., 2001; Robinson, 1987). The outcomes of this study supported the previous research. Participants in this study cited enjoyment and a perceived benefit as key facilitators to adherence.

When facilitators were not present, participants' complete non-adherence was common. Over one-third of the total 75 recommendations were not performed even *a little bit*. For these recommendations that were not adhered to, participants were asked to cite barriers that kept them from performing the activities. Several barriers that attributed to non-adherence included: forgetting recommendations, receiving too many recommendations, and receiving recommendations that were boring, too time consuming or inappropriate (they did not match goals or were too difficult).

Forgotten recommendations were the most commonly cited barrier. Recommendations seem to have been forgotten either because participants found the recommendations boring and therefore not memorable, or they felt inundated with too many recommendations. A common explanation for this was participants had received too many recommendations over the course of their condition and were overwhelmed with the amount they had and did not know which were most important. As a result, some recommendations were ignored or deferred and never returned to at a later date. It is worth noting that the majority of recommendations that were forgotten were preparatory recommendations. With participants citing preparatory recommendations generally to be less enjoyable, they may have been more apt to forget some of the preparatory exercises. Forgetting recommendations, however, can be detrimental because recommendations with potentially high benefits can be completely overlooked.

ADHERENCE TO DISCHARGE RECOMMENDATIONS

Participants also were less adherent to recommendations that they found boring or too time consuming. When given large amounts of recommendations over time and from many different health care professionals, they began to pick and chose those they found most enjoyable and easiest to fit into their routines. The results of the study suggest that providing clients with occupation-based recommendations yielded higher adherence because they were more enjoyable to participants as they were specifically related to engagement in desired occupations.

When occupation-based recommendations were not adhered to, participants reported the activities to be too challenging, unsafe, or completely unrelated to their goals. Several of the recommendations made by the student therapists were to engage in activities the participants enjoyed before their change in health status, but had been unable to participate in since. The participants, however, did not feel that those recommendations were appropriate because the activities were too challenging or unsafe. Other participants felt that they were assigned occupation-based recommendations that were not at all related to their personal goals. The two previous barriers suggest that while occupational therapy seeks to be client centered, there may be a gap between the goals a therapist has for her client and the client's actual goals.

The barriers cited by participants in this study can likely be resolved through collaboration among care team members and with clients. Clients are inundated with recommendations from many therapy fields and become overwhelmed and either forget some of their recommendations or choose not to do them because they are too time consuming. Therapists should ask clients what other recommendations are currently being done at home in order to prevent redundancy. Perhaps recommendations can be replaced with new, more fitting ones or old recommendations can be adapted to meet a client's current needs. Therapists should also work with clients and other team members to produce a realistic schedule. It is critical

ADHERENCE TO DISCHARGE RECOMMENDATIONS

therapists inquire about how much time each client can engage in therapy recommendations each day or week. Recommendations should then be prioritized around client goals. If clients are receiving both occupational and physical therapy, therapists can collaborate with each other to write recommendations for clients that incorporate both therapies' goals. This allows clients to engage in more therapeutic activities in the most time efficient manner. The most important factor in strengthening adherence to discharge recommendations is to collaborate with the clients when writing home programs to ensure that clients understand the benefit of the activities they are being asked to perform and that the activities truly focus on allowing clients to engage in their most desired occupations.

Additional Implications for Occupational Therapy

Over half of the recommendations given in this study were preparatory activities. As the results show adherence is higher for occupation-based recommendations compared to preparatory methods, occupational therapists should strongly consider giving fewer recommendations requiring rote exercise and more recommendations that allow clients to directly engage in a desired occupation in order to increase client adherence, and in turn, health outcomes. Occupation-based recommendations allow for greater occupational engagement but were sparsely given upon discharge from the on-site clinic used in this study. This may be due to the fact that the therapists were novice students and not experienced with writing home programs. However, if giving clients large amounts of preparatory recommendations and minimal purposeful and occupation-based recommendations is a trend in occupational therapy in general, clients are not being served in a way that provides them the greatest benefits occupational therapy has to offer. It is of utmost importance for therapists to keep in mind the founding principles of occupational therapy when writing home programs by keeping

ADHERENCE TO DISCHARGE RECOMMENDATIONS

recommendations client centered and occupation-based. This will produce the greatest levels of adherence among clients.

Limitations

There were several limitations to this study. As the method of participant recruitment was a convenience sample, there was not large variation within the population. All participants of this study were from the same on-campus clinic, and all had chronic conditions, with the majority experiencing deficits as result of a cerebral vascular accident. All but one participant was White, thus limiting the ability to generalize these findings to people of other ethnicities. Most clients had received occupational and physical therapy in the past and many had attended the on-campus clinics the year prior and had received several home programs prior to attending the 2012 clinic. The participants in this study, therefore, do not represent the typical occupational therapy client, most of whom receive therapy services and home programs shortly after an injury or trauma.

Although participants appeared to be very comfortable and candid during the interview, there are two possible limitations to the research design that may have impacted results. The survey process was not anonymous, thus clients may not have felt comfortable truthfully reporting both their levels of adherence to recommendation as well as perceived barriers, especially if they felt their comments might reflect dissatisfaction with the care received. Additionally, the survey responses were not audio-recorded, allowing for the possibility that lengthy answers to the open-ended questions were not completely captured. Finally, the number of participants included in the study was 18, and the number of purposeful recommendations (12) and occupation-based recommendations (13) given was small. A participant pool of 30 with 150 viable recommendations would have allowed the researcher to run more powerful statistical analyses.

Future Research

Since the sample size was small and of a homogeneous population and the number of purposeful and occupation-based recommendations was limited, a similar study with a larger, more typical client population is needed to reduce the likelihood of a type II error. Use of this type of study to examine patient adherence upon discharge from other types of occupational therapy settings, such as in-patient and out-patient rehabilitation would be ideal to show explore adherence rates across settings and would increase the ability to generalize this study's findings.

In this study, the number of preparatory recommendations given to clients was much higher than the other two recommendation types, which may not be ideal for a chronic population as a sole means of therapy because although preparatory activities aid in health maintenance and prevent decline, they do not help clients to increase their overall engagement. There is a need of additional research to understand if this is a common trend in occupational therapy or if it was the result of student therapists being less experienced. Finally, researchers could explore whether or not there is a link between type of discharge recommendation and overall health outcomes, including patient reported quality of life and functional independence.

Conclusion

This study found that clients of an on-campus occupational therapy clinic adhered to discharge recommendations that were occupation-based at a higher rate than to recommendations that were preparatory activities. While clients adhered entirely to recommendations that were purposeful at a rate two times higher than those that were preparatory, the number of recommendations included in the analysis may not have been large enough to produce a statistically significant difference. Giving clients too many recommendations to adhere to, especially those involving rote activity, may have resulted in clients forgetting recommendations

ADHERENCE TO DISCHARGE RECOMMENDATIONS

entirely. Clients tended to respond best to recommendations when they understood and experienced the benefits of the activity, when the recommendations were easy to fit into their daily routines, and were considered enjoyable to the individual. Recommendations that were perceived as not fitting with clients' goals were not performed. Recommendations that helped clients to engage in desired occupational goals or allow clients to perform an actual desired occupation had the greatest levels of adherence. If occupational therapists can collaborate with clients when setting goals and making home recommendations, providing recommendations that allow clients to participate in desired occupations, it is likely that overall client adherence will increase, which may lead to better long-term health outcomes and increased functional independence.

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Appendix

Survey on Home Recommendations from OT Student Clinic at UPS

Script: Good (morning, afternoon, evening). My name is Jennie White. I am an occupational therapy student from the University of Puget Sound. Thank you for your willingness to participate in this study. You are helping us to better understand the value and feasibility of the home program recommendations made by our students.

In this survey, I will ask you about how well the recommendations that you received at the end of the occupational therapy student clinic last spring worked for you. As a reminder, the information you tell me will not be shared with your former [or current (if applicable)] student therapist(s) or their/her/his clinical instructor(s) and will in no way impact your eligibility to return to our clinic for future services. The information, however, will be used to improve the recommendations that the students make to clients in the future.

Last spring, the occupational therapy student that worked with you gave you [X number] of recommendations at the end of clinic for you to work on at home. For each recommendation I will ask you whether you implemented the activity into your life, performing it entirely as recommended by your student therapist, mostly, a little bit or not at all. I will read each recommendation to you separately and then ask your level of participation in each activity. I will then ask you follow up questions regarding each recommendation. Please be as honest as possible. If any question makes you feel uncomfortable or should you not remember your level of involvement in a particular activity, you may choose to skip and move to the next recommendation.

Let's begin:

For each recommendation read the relevant section of the home program and ask the following:

For activities not previously coded as preparatory methods the following questions will be asked:

1. Is this an activity you had participated in before your (list diagnosis that brought client to OT therapy. Ex. Stroke, fall, surgery, etc.) *If yes:* Was this something you and your therapist discussed and you wanted to be able to do it again? *If no:* Was this an activity you specifically wanted to be able to do and add into your routine or lifestyle?

The following questions will be asked for all recommendations:

1. Did you do this activity as recommended to you: entirely, mostly, a little bit, or not at all?
2. Are you still doing this activity or have you stopped?
If no longer doing the activity: Why did you stop the activity?
3. Do you feel this activity helped you improve: a lot, somewhat, a little bit or not at all.
4. Was the purpose and/or benefit of the activity explained to you by your student therapist?

ADHERENCE TO DISCHARGE RECOMMENDATIONS

5. How clear was the explanation of the purpose or benefit of the activity: very clear, somewhat clear, a little confusing, or very confusing.
6. What is your understanding of the purpose and/or benefit of the activity?
7. Did you understand and remember how to perform the activity once you were at home?
If no: Did your student therapist give you any written or visual instructions on this activity to take home with you?
8. How feasible was it for you to fit the activity/exercise into your routine: very easy, somewhat easy, a little difficult, or very difficult?
If difficult: What made fitting in the activity difficult?
If easy: What made fitting in the activity easy?
9. Did you find the activity/exercise: Very fun or enjoyable, somewhat fun or enjoyable, a little boring or unpleasant or very boring or unpleasant?
10. What did you like or dislike about the activity/exercise?

That concludes the list of recommendations made by your student therapist and our interview. Thank you for taking time to answer my questions. Your opinion is valued and greatly appreciated. Before I hang up [or if in person: Before we end], is there anything else you would like to add that might help our students in making effective recommendations?
Again, thank you for your time (Mr./Ms. X).

If participant is unable to think of an explanation for why a recommendation was not feasible to fit into his/her routine the interviewer may offer the following prompts:

- You did not have a therapist, caregiver or family member to assist or remind you in the activity making it hard to remember to do the activity.
- You did not have adequate transportation to participate in the activity.
- There was a monetary cost to the activity.
- You did not have the supplies required to participate in the activity.
- Your health declined making the activity too hard.
- The activity initially was too difficult to complete or caused pain.
- The activity took too much time.
- The activity was not a priority for you.
- You experienced a lack of motivation to participate due to depression or anxiety.

ADHERENCE TO DISCHARGE RECOMMENDATIONS

Table 1
Facilitators and Barriers to Adherence to Discharge Recommendations

	Number of times cited by participants				
	Preparatory	Purposeful	Occupation- Based	Not Specified	Total
Facilitators					
Clear, detailed explanation of purpose	0	0	0	4	4
Visual aid and/or written instructions provided	18	7	7	0	32
Feasible/easy to fit into daily routine	13	8	11	0	32
Participant perceived high benefit from activity	-	-	-	10	10
Participant described activity as very enjoyable	-	-	-	8	8
Required little equipment	1	0	0	0	1
Barriers					
Recommendation was forgotten	10	3	0	0	13
Too many recommendations	2	-	-	4	6
Activity was boring/unpleasant	4	0	0	0	4
Activity was too difficult/unsafe	1	1	3	0	5
Activity did not match goal	1	2	2	0	5
Time consuming, hard to fit in routine	6	1	2	0	9
Too expensive	0	0	1	0	1
Explanation and/or benefit unclear	-	-	-	4	4

*When responding to the question, “Do you have any additional comments?,” participants did not link comments to specific types of recommendations.

ADHERENCE TO DISCHARGE RECOMMENDATIONS

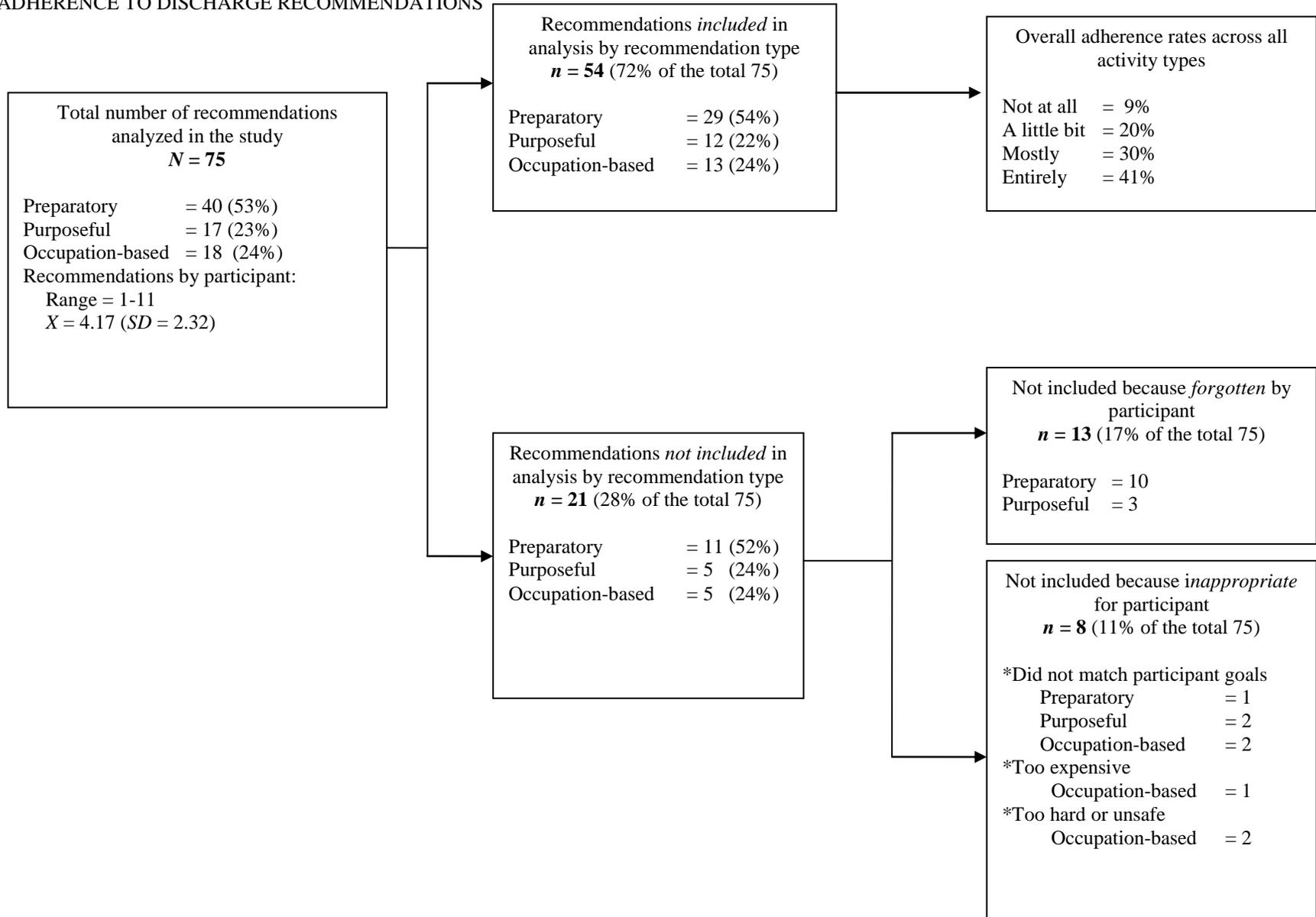


Figure 1. Total Number of Discharge Recommendations and Number of Recommendations Used and Not Used in Analysis of Adherence by Recommendation Type.

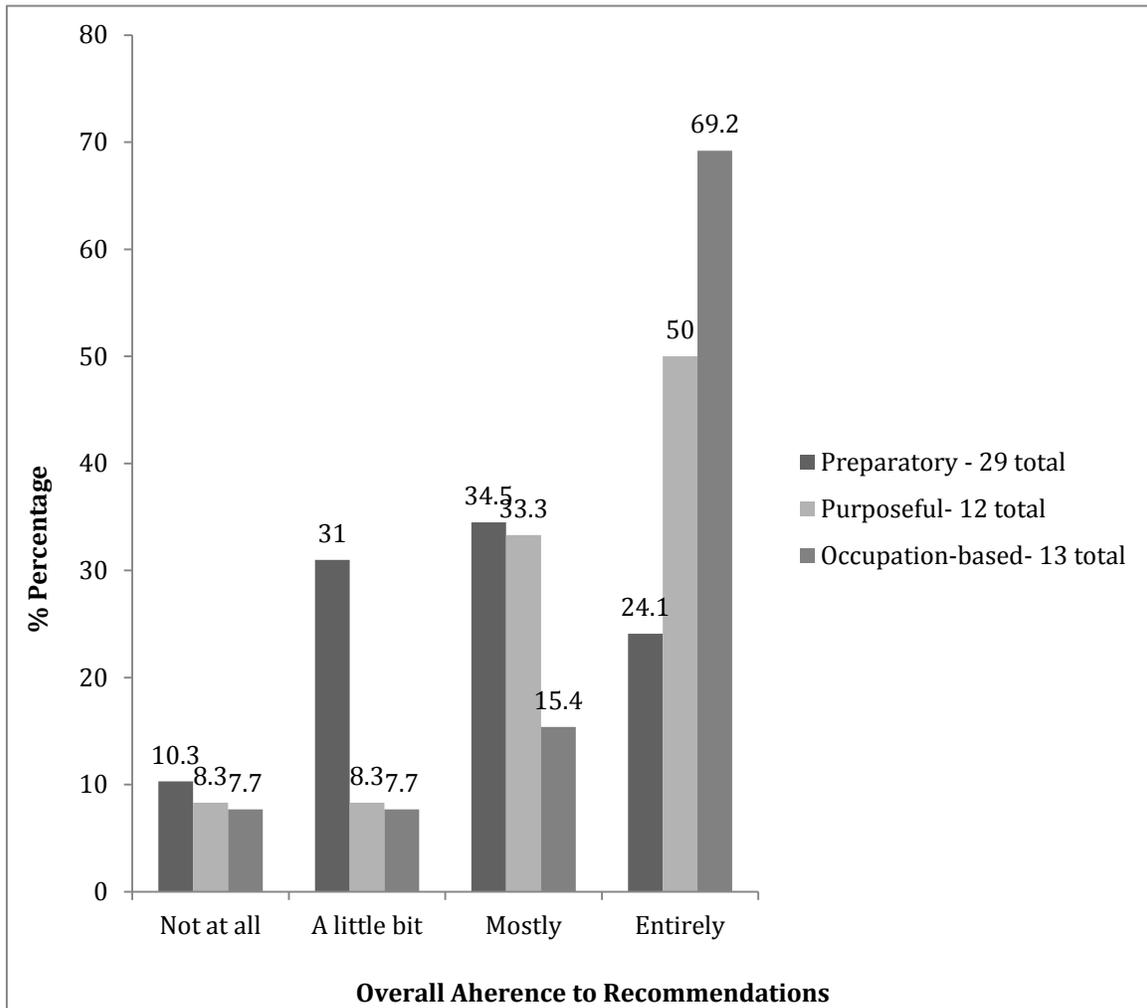


Figure 2. Adherence Level by Type of Discharge Recommendation

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