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Successful Patient Participation in Acute Hospital Physical Therapy

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SUCCESSFUL PATIENT PARTICIPATION IN ACUTE HOSPITAL PHYSICAL THERAPY

By

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A doctoral project submitted in partial fulfillment
of the requirements for the

Doctor of Physical Therapy

Department of Physical Therapy
School of Allied Health Sciences
Division of Health Sciences
The Graduate College

University of Nevada, Las Vegas
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Successful Patient Participation in Acute Hospital Physical Therapy

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ABSTRACT

Purpose/Hypothesis: Research has demonstrated that physical therapy plays a crucial role in patient recovery in the acute hospital setting. Despite known benefits, scheduled sessions do not always occur and are called nontreatment (NT) events. Reported NT ranges from 15% to 26% of scheduled sessions. Previous studies have found an association between NT and patient diagnosis as well as between NT and day of the week on which treatment was scheduled. Identifying additional factors that affect NT is important if therapists and administrators are to make improvements. The purpose of this study is to determine if an association exists between physical therapist attributes and NT risk among their patients. A secondary aim of this study is to confirm that patient diagnosis and day of the week change the odds of NT, as those results were only seen in one prior study at a single hospital.

Subjects: 36 physical therapists and 623 of their consecutive adult patients who were scheduled for physical therapy during their hospital stay.

Materials/Methods: A cross-sectional, medical record review of 623 consecutive patients over 3 months scheduled for 2,419 physical therapy sessions.

Results: The overall NT proportion of planned therapy sessions was 13.2%, it was 4.8% for the first scheduled session, and 16.1% among remaining sessions. NT proportions for individual therapists ranged from 1.7% to 22.6% among therapists with at least 30 planned sessions. When male patients were scheduled for therapy with a female therapist, 25.5% of sessions resulted in NT. NT was 15.0% when female patients were scheduled for therapy with a male therapist, and 16.1% when the sex of the patient and therapist matched. As in previous studies, patients were less likely to experience NT if they had a musculoskeletal condition.

Conclusions: Findings from previous studies that patient diagnoses were associated with NT were confirmed. While the mean proportion of NT was around 15%, individual physical therapists may be much higher or lower. The sex of patients and therapists was associated with significantly different NT

proportions and should be evaluated further. Future research efforts should include other therapist traits that may influence NT.

Clinical Relevance: With a better understanding of reasons for NT, therapists and administrators may be able to match patients with therapists most likely to be successful in treatment. The relationship between sex of the patient and therapist may have an impact on the occurrence of NT. Hospital and rehabilitation department policies need to be evaluated in an effort to reduce the higher percentage of NT among patients without musculoskeletal diagnoses

TABLE OF CONTENTS

ABSTRACT.....iii

LIST OF TABLES.....vi

INTRODUCTION.....1

METHODS.....3

RESULTS.....5

DISCUSSION.....10

CONCLUSION.....13

REFERENCES.....14

CURRICULUM VITAE.....16

LIST OF TABLES

Table 1. Multivariate Model of Logistic Regression for individual therapist NT.....7

Table 2. Multivariate Model of Logistic Regression for NT.....9

INTRODUCTION

Physical therapy plays a crucial role in patient recovery in the acute hospital setting and can have many benefits when applied to the appropriate patient population.¹⁻¹¹ Implementation of an early mobility protocol by a mobility team resulted in more physical therapy sessions, improved patients' functional mobility, and was associated with a shorter length of stay (LOS) for hospital survivors.¹² When physical therapy is offered on the weekends, research suggests that participation by patients may result in a shorter length of stay.^{11,13} Research also shows that patients have better function when they are discharged from the hospital after receiving physical therapy treatments.^{6,10}

In order for physical therapy to be effective, the patients must be active participants in the treatment session.¹⁰ Evidence has shown that poor patient participation is prevalent in up to 21% of inpatient rehabilitation treatment sessions, and this can result in a longer LOS with lower functional outcome scores.¹⁰ The reasons for poor patient participation in physical therapy have not been well studied. A study by Buining et al. found that individual therapists have different personality traits and these differences may affect the outcomes for some patients.¹⁴ These findings suggest that there may be factors of the individual therapist or those of the patient that have the ability to lead to better participation in physical therapy and potentially better outcomes for the patient. However, despite the known benefits of physical therapy, not all scheduled sessions result in treatment. Scheduled therapy sessions that do not result in treatment can be called nontreatment (NT). The proportion of scheduled physical therapy treatment sessions in the acute care setting that result NT has been shown to range from 15% to 26%.¹⁵⁻¹⁷

A study published in the *Journal of Acute Care Physical Therapy* in 2015 by Young et al.¹⁷ investigated a variety of factors that had potential influence on the occurrence of NT events in the acute hospital. Young et al. found that NT events occurred more on Sundays than any other day of the week and Tuesdays had the lowest proportion of these events.¹⁷ When comparing patient diagnoses, this same study found that patients with injuries to the musculoskeletal system had a smaller proportion of NT compared

to patients with other diagnoses.¹⁷ A newer study published in *Physical Therapy Journal* in June 2016 by Young et al. confirmed these findings including the day of the week and the diagnosis of the patient.¹⁶ However, these results were obtained at only one hospital and the treating physical therapist for each NT event was not known. Also, they were not able to compare the physical therapist attributes with the patient attributes due to missing data.

The association between physical therapist and patient attributes on NT has not yet been explored in the acute hospital setting. If a relationship between NT and patient or physical therapist factors is found, health care providers will be able to identify patients, physical therapists, or a combination of the two that may be at a high risk for NT events. This information could be used by providers and hospital administrators to identify scheduled treatments at a high risk for NT and adjust their approach to increase the likelihood of scheduled treatment resulting in actual treatment. Therefore, the purpose of this study is to determine if an association exists between the patient and physical therapist attributes, and occurrence of NT. A secondary aim of this study is to confirm that patient diagnosis and day of the week change the odds of NT among a unique group of therapists and patients.

METHODS

Study Design

This study was a retrospective analysis of physical therapist documentation of all consecutive patients scheduled for physical therapy in an acute care hospital in the Southwestern United States. The study was approved by the University of Nevada, Las Vegas institutional review board.

Facility and Subjects

The subjects were 36 physical therapists employed at a 454-bed community hospital in the Southwestern United States and 623 of their consecutive adult patients aged 18 years and older who were scheduled for physical therapy. The patient data were extracted from the medical record. Data on patients (sex, age, medical diagnosis, scheduled physical therapist, and day of the week treatment was scheduled) were collected retrospectively. Patient diagnosis were grouped into categories according to previously published work.^{16,17} If one diagnosis could not be confidently decided on, the diagnosis was categorized as “unknown”.^{16,17}

Data from scheduled physical therapy sessions indicated whether or not the patient received treatment and which therapist made the attempt. In cases of NT, the therapist documented reason (i.e. patient refusal, medical condition, scheduling/timing, staffing, patient discharged, and/or death) was collected. If the reason for NT was unclear it was grouped with “unknown”.

Data Analysis

Descriptive statistics included proportions of NT, calculated by dividing the number of NT events by the total number of scheduled sessions. The first visit of physical therapy was analyzed separately due to the fact that most first sessions will result in treatment (i.e. if an initial evaluation for a patient does not occur, it is typically not documented as NT). Therapists who had less than 30 scheduled patient sessions were also analyzed separately. Chi-square and binary logistic regression were used to measure the

association between characteristics (gender, patient-therapist sex match, diagnosis, and day of the week) and NT. All data was analyzed using SPSS Version 23.

RESULTS

Demographics

Data was collected on 623 patients scheduled for 2419 sessions of physical therapy. That total number included scheduled sessions resulting in either treatment or NT. The age of patients was between 17 and 99 years, with a mean of 70.7 years (SD=15.95). The number of scheduled sessions for female patients was (57.4%, n= 1389) and (42.6%. n=1030) for male patients. The number of scheduled sessions within each diagnosis group were not the same. Diagnostic groups with the greatest number of scheduled treatment sessions included cardiovascular (n= 533, 22%), musculoskeletal (n=520, 21.5%), pulmonary (n=315, 13.0%), and gastrointestinal (n=248, 10.3%), whereas wound (n=91, 3.8%) had the fewest. Diagnostic categories including other (endocrine, infectious disease, failure to thrive, and substance abuse) (n= 204, 8.4%), neurological (n=172, 7.1%), cancer (n=172, 7.1%), and renal (n=165, 6.8%), had similar numbers of scheduled treatment sessions.

The number of scheduled sessions for each patient ranged from 1 to 21. The mean number of scheduled sessions per patient was 3.81; quartile values (25th, 50th, and 75th) for the number of scheduled sessions were 1, 3, and 5. The two most commonly documented reasons for NT were “patient refusal” (39.4%) and “medical condition” (30.3%), whereas the least reported reasons were “unknown” (4.7%), “patient discharged” (5.6%), and “schedule/timing” (1.2%).

NT for individual therapist

Data was collected on thirty-six physical therapists (23 male therapists and 13 female therapists). For all scheduled physical therapy treatment sessions, including the first scheduled session, the proportion of NT for individual therapists ranged from 0.0% to 50.0%; 13.2% of all scheduled sessions (n= 2419) resulted in NT. When excluding the first scheduled session and therapists with less than 30 scheduled sessions, the proportion of NT was 16.1%; NT amongst therapists ranged from 1.7% to 22.6%.

When excluding the first scheduled session and therapists with less than 30 scheduled patient sessions, a significant association was found between individual therapist and NT proportion [χ^2 (21, N=1651) =59.481, $p < 0.001$]. An unadjusted binary logistic regression was conducted to establish odds ratios for each individual therapist. Table 1 shows NT data and odds ratios excluding the first session for all therapists with at least 30 scheduled treatment sessions. Therapist odds of NT vary greatly. Therapist 1 was used as the reference and had the lowest NT occurrence at 1.7%. Compared to patients seen by therapist 1 (reference), patients seen by therapist 21 were 20.6 times more likely to have NT (Table 1).

Table 1.

Multivariate Model Based on Binary Logistic Regression

Therapist Non-Treatment Rank	OR (95% CI) Compared to Best Therapist
1 (reference)	
2	2.1 (0.11-35.1)
3	2.8 (0.27-28.8)
4	3.0 (0.3-27.0)
5	3.2 (0.4-25.6)
6	4.6 (0.5-43.5)
7	5.9 (0.6-56.2)
8	6.2 (0.8-49.2)
9	7.5 (0.9-62.4)
10	8.1 (1.0-63.4)*
11	9.1 (1.0-83.0)
12	9.8 (1.2-81.1)*
13	9.8 (1.2-82.0)*
14	9.9 (1.2-79.8)*
15	10.5 (1.4-80.7)*
16	10.6 (1.4-82.3)*
17	11.0 (1.4-89.3)*
18	12.2 (1.4-104.0)*
19	13.2 (1.6-107.5)*
20	15.9 (2.0-126.7)*
21	17.8 (1.9-167.9)*
22	20.7 (2.3-186.0)*

Model: excluding therapists with less than 30 scheduled sessions and session 1. OR=odds ratio, CI=confidence interval.

*p<0.05

Day of the Week

NT varied by day of the week with Fridays having the lowest proportion at 10.0% compared to 16.0% on Sundays. When excluding the first scheduled session and therapists with less than 30 scheduled patient sessions, the association between day of the week and NT was not significant [$X^2(6, N=1651) = 2.821, p=0.831$].

Diagnosis

Patients with a musculoskeletal diagnosis had the lowest NT proportion at 9.0%. When compared to patients with a musculoskeletal diagnosis, patients with other diagnoses were significantly more likely to experience NT. When excluding the first scheduled session and therapists with less than 30 scheduled patient sessions, a significant association was found between patient diagnosis and NT [$X^2(8, N=1651) = 30.452, p < 0.001$]. Binary logistic regression, as shown in Table 2, provides the odds ratios for each of the diagnosis categories. In summary, patients with a diagnosis of cancer had 2.4 times the odds for a NT event compared to patients with a musculoskeletal diagnosis (Table 2).

Patient Sex & Age

When male patients were scheduled for therapy, 18.9% of interactions resulted in NT compared to 15.3% for women. When excluding the first scheduled session and therapists with less than 30 scheduled patient sessions, a significant association was found between patient age and NT [$X^2(71, N=1651) = 125.45, p < 0.001$]. For each year that a patient ages, their odds of NT decrease by 1.8% (Table 2).

Patient-therapist sex match

There appears to be a relationship between NT and the match of patient sex and sex of the therapist. When male patients were scheduled for therapy with a female therapist, 25.5% of sessions resulted in NT. NT was 15.0% when female patients were scheduled for therapy with a male therapist, and 16.1% when the sex of the patient and therapist matched. When excluding the first scheduled session and therapists with less than 30 scheduled patient sessions, a significant association was found between a patient's sex in relation to their therapist's sex and NT [$X^2(2, N=1651) = 6.522, p = 0.038$]. Female patients who were treated by a male therapist had 39% lower odds for NT compared to male patients treated by a female therapist (Table 2).

Table 2.
Multivariate Model Based on Binary Logistic Regression

Variable	OR (95% CI)
Day of the week	
Friday (reference)	
Monday	1.17 (0.68-2.01)
Tuesday	1.04 (0.60-1.83)
Wednesday	1.30 (0.75-2.27)
Thursday	1.2 (0.71-2.18)
Saturday	1.00 (0.54-1.88)
Sunday	1.17 (0.64-2.14)
Diagnosis	
Musculoskeletal (reference)	
Wound	0.26 (0.05-1.21)
Renal	1.05 (0.48-2.30)
Pulmonary	1.93 (1.10-3.38)*
Neurological	1.96 (1.01-3.82)*
Cardiovascular	2.00 (1.21-3.32)*
Gastrointestinal	2.06 (1.16-3.64)*
Cancer	2.40 (1.32-4.37)*
Other	2.54 (1.38-4.70)*
Age	0.982 (0.97-0.99)*
Patient-therapist sex match	
Male patient, female PT (reference)	
Sex match	0.72 (0.50-1.06)
Female patient, male PT	0.61 (0.40-0.92)*

Model: excluding therapists with less than 30 scheduled sessions and session 1. OR=odds ratio, CI=confidence interval.

*p<0.05

DISCUSSION

The purpose of the present study was to determine if an association existed between the physical therapist and occurrence of NT, as well as determining if an association between traits of the patient and therapist exists. A secondary aim of this study is to confirm that patient diagnosis and day of the week change the odds of NT as reported in previous studies.^{16,17} The main findings from this study demonstrate that individual therapist, patient diagnosis, patient age, and patient-therapist sex match all appear to be factors in NT in the acute hospital setting.

As expected, the NT proportion for the first documented session between a therapist and patient was very different from that of other scheduled treatments. The total NT proportion for all scheduled therapy sessions was 13.2%. The proportion of NT for the first scheduled session was 4.8%, and 16.1% for the remaining sessions. As previously stated, it is likely that an initial evaluation for a patient that does not occur is not documented as the therapist has not established a plan of care for that patients and so the session cannot be considered scheduled. It is also possible that hospitals and therapists place a greater urgency for therapy to occur on the first scheduled session, resulting in the lower NT proportion.

A previously published study by Young et. al¹⁶ had hoped to measure the association between physical therapist and NT proportion. However, they had a significant number of unidentified therapists and undocumented reasons for NT in their data. The data from our study included the physical therapist for all scheduled treatment sessions. We found a significant association between the individual therapist and the proportion of NT. NT proportion for individual therapists ranged from 1.7% to 22.6% among therapists who had at least 30 scheduled sessions. This finding may suggest that differences in NT occurrence could be attributable to traits of the individual therapist or the match between therapist and patient. The reasons for differences between therapists NT proportions should be investigated further.

Also found in previous studies was an association between day of the week and NT occurrence.^{16,17} Our study aimed to see if this finding would be present in a different population of patients and therapists. The mean proportion of NT on the weekends was higher than during the weekdays, however, this difference was not statistically significant. The difference in NT was previously

explained by the decreased staffing on weekends, with 20-30% reduction on Saturday and Sunday.^{16,17} It is also possible that there are a higher proportion of evaluations during the weekends due to less overall scheduled treatments for the weekend. As previously stated, first sessions have a much lower NT proportion and this could explain the lack of a significant difference between weekday and weekend NT.

In previous studies, an association was found between patient diagnosis and occurrence of NT.^{16,17} This study aimed to investigate this finding, and we were able to confirm those results. NT proportions ranged from 9.0% for patients with musculoskeletal diagnoses to 23.7% for those with cancer diagnoses. Previous studies showed the lowest NT proportions among patients with musculoskeletal diagnoses as well. Many hospitals make patients with musculoskeletal conditions a priority to ensure that physical therapy services occur. Patients with Wound Care as a primary diagnosis also had lower occurrence of NT in comparison to those with other primary diagnoses. The consequences and further complications that may result in the event of a neglected wound might be another explanation for the low percentage of NT. Patients with Cancer had higher occurrences of NT. It is possible that patients with cancer may have decreased activity tolerance due to their conditions and refuse services due to cancer related fatigue.¹⁸

The present study also attempted to determine if an association existed between patient age and sex with NT. A significant association was found in age, with older patients having a lower occurrence. Older individuals may see their debilities as a more serious issue and see the importance of therapy to prolong their lives. It is also possible that the physical therapists in this hospital places a greater importance on physical therapy for the elderly to reduce the readmission rate and allow a return to the community.¹⁹ No significant association was found between patient sex and the occurrence of NT.

The new findings from this study include the association of the patient-therapist sex match on the occurrence of NT. When considering male patients treated by a female therapist, 25.5% of sessions resulted in NT. This proportion was 15.0% when female patients were treated by a male therapist, and 16.1% when the sex of the patient and therapist matched. Future studies should be conducted to determine

how patient's beliefs about the sex of their therapist impacts their willingness to participate in therapy as well as the beliefs of the physical therapist on how they approach patients of different sex.

Limitations

All patient and therapist data were retrieved from a single hospital in the Southwest United States. Because of this, generalizability is limited to a similar population and may not accurately reflect other hospitals, regions, or patient populations. There were 14 therapists who were scheduled to treat less than 30 patients. Their data was excluded from a majority of the analysis due to the small sample size. Patients who had multiple medical diagnoses were grouped into the diagnostic category that was that appeared to be primary for the admission, and this determination was made consulting with the lead physical therapist. This may have introduced information bias and changed our findings. Perhaps instead of grouping all patients into one diagnostic category, there could have been a comorbidity count or the AHRQ comorbidity index to use as a variable in our modeling.²⁰ Perhaps patients with 3 or more comorbidities had a significantly different occurrence of NT in comparison with musculoskeletal diagnoses. Further studies should explore this hypothesis.

CONCLUSION

The purpose of the present study was to determine if an association existed between the physical therapist and occurrence of NT, as well as determining if an association between traits of the patient and therapist exists. A secondary aim of this study is to confirm that patient diagnosis and day of the week change the odds of NT as reported in previous studies. Individual therapist, patient diagnosis, patient age, and patient-therapist sex match all appear to be factors in NT in the acute hospital setting. Individual therapists have different percentages of NT. Musculoskeletal diagnosis was associated with the lowest proportion of NT over other diagnoses. It also appears that older patients are less likely to have NT occur. There also appears to be a relationship between patient and therapist sex. Male patients who were scheduled for therapy with a female therapist had more sessions result in NT. Because NT varies so greatly among different therapist, future research needs to be conducted to explore the association of other physical therapist traits, such as personality or education level, on the percentage of NT in the acute care setting. With a better understanding of reasons for NT, therapists and administrators may be able to match patients with therapists most likely to be successful in treatment.

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