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Therapist Characteristics Influencing Physical Therapy Non-Treatment in the Acute Care Setting

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THERAPIST CHARACTERISTICS INFLUENCING PHYSICAL THERAPY

NON-TREATMENT IN THE ACUTE CARE SETTING

By

Daniel McGarvey, Colby Olsen, Aaron Van Wagoner

A doctoral project submitted in partial fulfillment

of the requirements for the

Doctorate of Physical Therapy

Department of Physical Therapy

School of Allied Health Sciences

The Graduate College

University of Nevada, Las Vegas

May 2012
THE GRADUATE COLLEGE

We recommend the doctoral project prepared under our supervision by

Daniel McGarvey, Colby Olsen, and Aaron Van Wagoner

entitled

**Therapist Characteristics Influencing Physical Therapy Non-Treatment in the Acute Care Setting**

be accepted in partial fulfillment of the requirements for the degree of

**Doctor of Physical Therapy**

Department of Physical Therapy

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May 2012
Abstract

**Background and Purpose:** Research has found that participation in physical therapy (PT) services in the acute care setting increases functional outcomes and decreases patient length of stay. Certain physical therapist characteristics could be a potential source of influence on patient non-participation in physical therapy in the acute care setting. The purpose of this study was to determine whether specific characteristics of therapists and patients are predictive of physical therapy non-treatment.

**Subjects:** Subjects included 16 physical therapists or physical therapist assistants and 1225 patients at a community acute care hospital.

**Methods:** Characteristics of each therapist and their corresponding patient data were collected from the 16 therapists at a community acute care hospital. Logistic regression was used to identify any therapist or patient factors predictive of patient non-participation in physical therapy services during their second scheduled visit.

**Results:** Odds ratios were found to be significant for the following variables: Wednesday, the “Other diagnosis” grouping, and 2 out of the 14 therapists. Odds ratios for these variables were 0.455, 2.146, 8.804, and 10.359 respectively.

**Discussion and conclusion:** No surveyed therapist characteristics were predictive of non-participation of physical therapy treatment in the acute care setting. Though measured attributes were not predictive, being a specific therapist, patients fitting into the “other” diagnosis category and being treated on Wednesday were predictive of non-treatment. Future research should focus on evaluating further therapist characteristics not included in this study, such as personality traits.
Introduction

Functional ability of patients and length of stay (LOS) are significant concerns in acute care facilities. Research has shown that patients who participate well in physical therapy services decrease their average length of stay by 3 days in both rehab and acute care settings. Lenze et al. showed that a patient’s motor scores on the Functional Independence Measure (FIM) showed significant improvements while participating in acute care physical therapy services. The FIM motor score consists of 13 motor items that make it possible to assess functional independence in a variety of patient populations. The Lenze study classified patients into 3 participation levels; good, occasionally poor, and frequently poor. The greatest improvement in functional outcomes was found in those with good participation (23.2%), followed by occasional participation (22.8%), and was lowest in those with poor participation (17.6%). Poor participation was also associated with a longer length of stay (LOS). Good participation in physical therapy had a positive impact on decreasing cost for the patient, the facility, and societal healthcare costs in general.

In 1983 the Centers for Medicare & Medicaid Services introduced the prospective payment system (PPS) for use of physical therapy services. Under this payment system, hospitals are no longer reimbursed by fee for service, but rather are given a lump sum at the beginning of an episode of care. This sum is based on the assignment of the patient into one of many different diagnosis-related groups (DRG). This incentivizes hospitals to treat patients as efficiently as possible and cut unnecessary spending. Holt et al. found that one of the significant changes hospitals made to reduce costs was to decrease overall patient length of stay. When an increase in utilization of PT services was incorporated
LOS decreased by 1.6 days on average.\(^9\) Though we know that physical therapy services can benefit both the patient and the facility, there still remains a portion of scheduled treatments that do not occur.

The rate of non-participation of scheduled acute care physical therapy treatment sessions has been shown to range from 15-26%, yet reasons for these non-participation events remain unclear.\(^{10,11}\) It would seem beneficial to patient outcomes to identify reasons why some treatments do not occur and whether there are contributing factors that are within our control. If these factors do exist, understanding where they come from and how strongly they influence participation may help determine how to decrease patient non-participation rates. We will look at the complex relationship between patient, therapist, the environment, other extrinsic factors, and the various contributing factors that this relationship infers.

Considering the complexity of the patient-therapist relationship, it is appropriate to break it down into smaller, more manageable parts. Previous unpublished research by Young et al. has categorized possible contributing factors into the following parts: patient factors (age, gender and diagnosis), therapist factors (income, years of experience, terminal degree, etc.), environmental factors, and other extrinsic factors (day of the week and reason for non-participation).\(^{11}\) While Young et al recognized all of these variables, their study focused on attributes related to the patient and other extrinsic factors. According to their findings patient factors had no significant influence on non-participation rates. They did, however, find a significant difference depending on the day of the week with non-participation rates ranging from 6.7% on Tuesday, to 25.3% on Sunday.\(^{11}\)
Our study focuses on characteristics of the physical therapist and how they influence patient non-participation rates. The effect of patient attributes and extrinsic factors will also be considered. Analyzing therapist attributes concurrently with patient non-participation rate data will help us identify what influence these attributes have on non-participation rates in the acute care setting. Because a myriad of possible outcomes could result from the analysis of these variables, it is difficult to determine or predict likely findings. If it is found that certain therapist characteristics are influential on non-participation rates, it would be beneficial to narrow the factors into a predictive model. A predictive model would provide administrators, physical therapy educators and current physical therapists with valuable information that may decrease patient non-participation, improve patient outcomes, and lower costs in the acute care setting.

Methods

Study Population

After receiving approval from the Institutional Review Board, data was collected from a single community hospital consisting of 454 beds. The hospital employs 8 full-time physical therapists (PT), 7-9 per diem physical therapists, 2 full-time physical therapy assistants (PTA) and 3 full-time physical therapy technicians. An attempt was made to recruit all therapists employed by the participating community hospital since 2008. Therapists were contacted directly, by email, phone or social networking sites. The survey was ultimately completed by 14 physical therapists and 2 PTAs. Of the respondents 8 (47%) were male and 9 (53%) were female. Years of experience ranged from less than 1 year to 21 years. Due to a lack of corresponding patient data, two therapists was excluded from the study, leaving 15 total therapists included for data
analysis. Retrospective patient data was collected from 1,225 patients, 558 were male (45.6) and 667 were female (54.4%). Corresponding patient data for each participating therapist were then analyzed. Data without a corresponding PT was excluded from analysis.

**Data collection**

A 15 question survey was developed to measure physical therapist characteristics that may influence non-participation rates (see figure 1). The survey included questions regarding work atmosphere, education level, experience, employment status, health limitations and access to PT technicians. It also included age, gender, race and salary.

Patient information was collected from daily therapist treatment notes which are independent of the official electronically submitted medical notes. The information collected represented 6,261 scheduled visits. Patients with only one documented physical therapy encounter were excluded from this study. Due to the subjective nature of these data, an established method\textsuperscript{11} that required consensus among the researchers was used when interpretation of the therapist’s documentation was required. If the documentation was unclear, deliberation between researchers took place until unanimous decision was made. A database was created using all previously collected patient data\textsuperscript{11} as well as patient data collected for this study. Data extracted from the therapist characteristic surveys was then entered into the database matching therapists to their corresponding patient load.
**Data Analysis**

Because the purpose of the study was to predict a dichotomous outcome (non-participation or participation) using therapist and patient characteristics as predicting factors, a logistic regression model was used utilizing SPSS version 18.0.‡ Statistical significance was set with an alpha value of 0.05. All second session encounters of the 16 therapists were selected for analysis due to a larger number of subjects when compared to other subsequent sessions. The first session was excluded because no missed visits were recorded during these initial evaluation sessions. All nominal data from the therapist survey were categorized in order to incorporate them into logistic regression.

Each reference variable used in the regression model was chosen based upon the corresponding second session non-participation rate. The variable which demonstrated the lowest non-participation rate was chosen to be the reference variable for data analysis (Table 1). Variables entered into the regression analysis were: patient diagnosis, day of the week, treating therapist, therapist age, therapist gender, therapist race, therapist income, years of experience in physical therapy, months of experience in acute care, terminal degree, employment status, hours worked per week, shift length and time of shift worked. A small number of variables were left out due to insufficient data or lack of variability in responses.

**Results**

Total number of encounters analyzed equaled 1225. The overall non-participation rate for the second visit was 16.9%. Individual therapist non-treatment rates ranged from

‡ SPSS Inc, 233 South Wacker Drive, Chicago, IL 60606
3.45% to 21.7%. As mentioned above, all categorical variables’ non-participation rates were calculated (see table 1).

Variables included in the final logistical equation were: patient diagnosis, day of the week and treating therapist. The reference variables for each of these categories were musculoskeletal, Thursday, and therapist 15, respectively. Odds ratios were found to be significant for Wednesday (0.455, p=0.043, CI=.213 - .974), “Other” diagnosis category (2.146, p=.040, CI = 1.043 – 4.451), Therapist 1 (8.804, p=0.047, CI=1.028 – 75.384) and Therapist 13 (10.359, p=0.027, CI = 1.300 – 82.539), when compared to their reference variables. Therefore, it can be said that a patient whose diagnosis does not fit into any of the 12 predetermined diagnosis categories is 2.146 times more likely to have a non-treatment encounter than a patient with a diagnosis fitting the Musculoskeletal category. Therapist 1 is 8.804 times more likely, and therapist 13 is 10.359 times more likely to experience a non-treatment encounter than the reference therapist. A non-treatment encounter is 0.455 times more likely to occur on a Wednesday than it is to occur on Thursday. This can also be stated that a non-treatment encounter is 2.198 times more likely to occur on Thursday than it is to occur on Wednesday.

Discussion

This study is helpful in distinguishing which factors may be predictive of patient non-participation in physical therapy services in the acute care setting. It showed that fitting within the “other” diagnosis category, being scheduled for treatment on Thursday, and being treated by 2 of the 16 Therapists was predictive of increased non-participation. Though there were therapists that were predicting factors in and of themselves, none of the data collected from the therapist surveys were able to predict non-participation.
With these findings it is reasonable to consider that patient non-participation could be attributed to patient and therapist personality traits. Research throughout medical literature has shown that characteristics such as a positive attitude, a pessimistic outlook and depression may have an effect on patient compliance and outcomes.\textsuperscript{12-14} Future research should focus on whether or not personality traits are predictive of patient non-participation. It should also be determined if matching therapist and patient personality traits could provide lower non-participation rates.

The diagnosis category of “other diagnoses” was our only predictor among our tracked diagnosis categories. The diagnosis category “other diagnoses” included diagnoses that did not fit into one of the 12 pre-determined categories, or if a diagnosis was not provided on the patient data card. Because the “other diagnoses” category consisted of various diagnoses which were likely not related to each other, it is not likely that any diagnosis within this group was predictive individually. It seems more likely that this group had more non-participation events because of extrinsic factors not related to the diagnosis. Based on the limitations of the data set, the contributing extrinsic factors could not be identified. It is interesting to note that previous research by Young et al., which used a portion of data from this study, did not find that diagnosis was predictive of patient non-participation. This could be attributed to their method of reference variable selection. Young et al. theorized that assigning the reference variable as the variable which demonstrated the non-participation rate closest to the facilities overall rate, was the most appropriate method of analysis.\textsuperscript{11} We on the other hand, theorized that the reference variable is most appropriately assigned as the variable with the lowest non-participation rate. The differences in these two methods could account for the differences in our
Another explanation for the conflicting findings between the two studies may be explained by the use of a logistic model, which inherently accounts for multiple variables in determining what is predictive. In this case, when incorporating therapist data into the model the predictive nature of both diagnosis and day of the week changed. Patient participation was found to be higher on Wednesdays than on Thursdays. This also differs when compared to the aforementioned research by Young et al. which found that patients scheduled on Sundays were more likely to experience a non-participation of physical therapy. This finding could be attributed to the use of a different reference variable or to the inherent logistic regression traits, as discussed above. Our findings that Wednesdays participation rates are higher, is still consistent with the idea that day of the week can be a predicative factor in determining non-participation. The differences in findings between this study and the Young study lend to the thought that though day of the week was predictive in both studies, the specific day may actually be dependent on many other factors such as current staffing situations or admitting and discharge trends.

Both studies were limited by subjective interpretation of documentation, despite the systematic method of interpreting and entering data as discussed in the methods section. Neither inter-rater reliability nor intra-rater reliability was assessed in either study. It is also possible that due to low sample size of therapists the current study may be under powered thus making the findings spurious in nature. Sampling therapist and patient data from only one facility in one region of the country, as well as a small therapist sample size creates a situation of low generalizability.
Future direction of research should address additional factors that may contribute to non-treatment in the acute care setting, such as therapist and patient personality traits. Any future findings will help hospitals and treating therapists to identify modifiable or non-modifiable risk factors for encountering patient non-participation. Identifying such factors may help to increase patient satisfaction and function, while decreasing costs to the patient and the treating facility. This will ultimately improve hospital-based physical therapy.

**Conclusion**

Individual physical therapist characteristics gathered from the therapist survey were not significant predictors of non-participation in physical therapy services in the acute care hospital setting. Though individual therapist characteristics were not predictive of non-participation, 2 of the 16 therapists were found to be predictors as well as being treated on Wednesday and being within the category of “other diagnosis”. Reasons for non-participation in the acute setting remain largely unexplained. It may be beneficial to examine internal therapist characteristics, such as personality traits to determine whether they can account for all or part of the unexplained reasons for patient non-participation in skilled physical therapy services in the acute care hospital.
### Therapist Survey

| Name: ___________________________ | Age: ________ | Gender: ______ 
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race (circle one):</strong></td>
<td>American Indian</td>
<td>Asian/Pacific Islander</td>
</tr>
<tr>
<td>Hispanic / Latino</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td><strong>Income (circle one):</strong></td>
<td>0-$34,999</td>
<td>$35,000-$49,999</td>
</tr>
</tbody>
</table>

1. How many years experience do you have as a physical therapist? _______

2. What is your terminal clinical degree? (circle one) Bachelors Masters DPT

**For the next set of questions answer only regarding acute care employment**

3. What is your current employment status (ie., FT, PT, PRN . . .) _______

4. How long have you worked in this setting? Years _____ / Months ______

5. How many hours do you work in the course of an average workweek? _______

6. What is the average length of your shift? ________

7. What time(s) of day do you typically work? ________

8. On average how many PT units do you bill per shift? ________

9. How many evaluations do you perform in an average week? ________

10. Do you have access to PT Techs? Yes No

11. If so, how many hours per day do you work with a Tech? ________

12. What types of tasks do your techs perform? __________________________________________

13. Does your current health limit you in any way from performing your work as a therapist? (circle one) Yes No

14. If yes how? __________________________________________

15. How well do you feel your entry-level education, including clinical rotations, adequately prepared you for a job in acute care? (where 1 is not at all prepared and 7 is very prepared)  

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
Table 2 – Non-participation rates per individual variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non – participation Rate</th>
<th>Variable</th>
<th>Non – participation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Therapist Gender</strong></td>
<td></td>
<td><strong>Therapist</strong></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>10.28%</td>
<td>- Therapist 1</td>
<td>21.74%</td>
</tr>
<tr>
<td>- Female</td>
<td>11.30%</td>
<td>- Therapist 2</td>
<td>7.94%</td>
</tr>
<tr>
<td><strong>Therapist Race</strong></td>
<td></td>
<td>- Therapist 3</td>
<td>11.22%</td>
</tr>
<tr>
<td>- Asian/Pacific Islander</td>
<td>8.65%</td>
<td>- Therapist 4</td>
<td>7.32%</td>
</tr>
<tr>
<td>- African</td>
<td>14.60%</td>
<td>- Therapist 5</td>
<td>6.52%</td>
</tr>
<tr>
<td>- Caucasian</td>
<td>14.58%</td>
<td>- Therapist 6</td>
<td>17.43%</td>
</tr>
<tr>
<td><strong>Therapist Income</strong></td>
<td></td>
<td>- Therapist 7</td>
<td>3.85%</td>
</tr>
<tr>
<td>- $35,000 – $49,999</td>
<td>7.94%</td>
<td>- Therapist 8</td>
<td>4.35%</td>
</tr>
<tr>
<td>- $50,000 – $74,999</td>
<td>14.97%</td>
<td>- Therapist 9</td>
<td>8.33%</td>
</tr>
<tr>
<td>- $75,000 – $99,999</td>
<td>8.99%</td>
<td>- Therapist 10</td>
<td>8.85%</td>
</tr>
<tr>
<td>- $100,000 +</td>
<td>11.22%</td>
<td>- Therapist 11</td>
<td>12.85%</td>
</tr>
<tr>
<td><strong>Therapist Terminal Degree</strong></td>
<td></td>
<td>- Therapist 12</td>
<td>10.53%</td>
</tr>
<tr>
<td>- Bachelors</td>
<td>8.30%</td>
<td>- Therapist 13</td>
<td>23.53%</td>
</tr>
<tr>
<td>- Masters</td>
<td>12.86%</td>
<td>- Therapist 14</td>
<td>8.33%</td>
</tr>
<tr>
<td>- DPT</td>
<td>12.87%</td>
<td>- Therapist 15</td>
<td>3.45%</td>
</tr>
<tr>
<td>- Associates</td>
<td>15.85%</td>
<td><strong>Patient Diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Therapist Employment Status</strong></td>
<td></td>
<td>- Cardiac</td>
<td>10.74%</td>
</tr>
<tr>
<td>- Full Time</td>
<td>11.59%</td>
<td>- Respiratory</td>
<td>15.00%</td>
</tr>
<tr>
<td>- PRN</td>
<td>8.53%</td>
<td>- Neurological</td>
<td>9.40%</td>
</tr>
<tr>
<td><strong>Day of the Week</strong></td>
<td></td>
<td>- Gastro/Abdominal</td>
<td>13.82%</td>
</tr>
<tr>
<td>- Sunday</td>
<td>11.90%</td>
<td>- Musculoskeletal</td>
<td>6.42%</td>
</tr>
<tr>
<td>- Monday</td>
<td>13.69%</td>
<td>- Cancer</td>
<td>14.89%</td>
</tr>
<tr>
<td>- Tuesday</td>
<td>7.89%</td>
<td>- Integument</td>
<td>10.00%</td>
</tr>
<tr>
<td>- Wednesday</td>
<td>13.37%</td>
<td>- Genitourinary</td>
<td>9.52%</td>
</tr>
<tr>
<td>- Thursday</td>
<td>7.52%</td>
<td>- Infectious disease</td>
<td>12.50%</td>
</tr>
<tr>
<td>- Friday</td>
<td>12.38%</td>
<td>- OBGYN</td>
<td>14.29%</td>
</tr>
<tr>
<td>- Saturday</td>
<td>10.65%</td>
<td>- NICU/Pediatrics</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Endocrine</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Other</td>
<td>16.67%</td>
</tr>
</tbody>
</table>
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7. de Morton N, Keating JL, Jeffs K. Exercise for acutely hospitalised older medical patients.


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• Salt Lake City, UT
• January 2012 – April 2012
Lifecare Center of Bountiful
• Skilled Nursing Facility
• Bountiful, UT
• October 2011 – December 2011
Ogden Clinic Physical Therapy
• Outpatient Orthopedic Physical Therapy
• Ogden, UT
• July 2011 – September 2011
Physiotherapy Associates – Children’s Therapy
• Pediatric Rehabilitation
• Henderson, NV
• June 2010 – July 2010

PROFESSIONAL MEMBERSHIPS
American Physical Therapy Association
• Orthopedic section member
• Acute Care section member
• Cardiovascular and Pulmonary section member
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Utah Physical Therapy Association

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Children’s Therapy Center – Physiotherapy Associates
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• Henderson, NV
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Physiotherapy Associates – Teneya
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• Las Vegas, NV
• January 2012 – February 2012
Mountain View Hospital
• Acute Hospital Inpatient Physical Therapy
• Las Vegas, NV
• October 2011 – December 2011
HealthSouth Rehabilitation Hospital
• Inpatient Rehabilitation hospital
• Las Vegas, NV
• July 2011 – September 2011
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• Outpatient Orthopedic Physical Therapy
• Las Vegas, NV
• July 2010- August 2010

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• Acute Care section member
• Research section member
• Pediatric section member
Nevada Physical Therapy Association

LICENSES AND CERTIFICATIONS
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• American Heart Association
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- June 2009 - May 2012
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- Bachelor of Science
- June 2002 – April 2009

CLINICAL INTERNSHIPS
Summerlin Hospital Rehabilitation Center
- Inpatient Rehabilitation Center
- Las Vegas, NV
- January 2012 – March 2012
Valley Hospital Medical Center
- Acute Hospital Inpatient Physical Therapy
- Las Vegas, NV
- October 2011 – December 2011
Southern Utah Physical Therapy and Rehabilitation
- Outpatient Orthopedic Physical Therapy
- Las Vegas, NV
- July 2011 – September 2011
Select Physical Therapy
- Outpatient Orthopedic Physical Therapy
- Las Vegas, NV
- July 2010- August 2010

PROFESSIONAL MEMBERSHIPS
- American Physical Therapy Association
- Nevada Physical Therapy Association

LICENSES AND CERTIFICATIONS
CPR certified
- American Heart Association