Association Among Select Clinical Data and Successful Completion of a Treatment Plan in an Outpatient Orthopaedic Physical Therapy Setting

Mark Bastan, DPT, OCS, CSCS
Ryan Toher, DPT, CertDN
Michael Nula, MS, DPT
Jason Harvey, MSPT

Elite Physical Therapy, Rhode Island

ABSTRACT

Outpatient physical therapy treatment and outcome can be influenced by many factors. Variables that influence success need to be identified. The purpose of this study was to determine the relationship of selected clinical variables on discharge success. Data from 669 discharged patients treated at 1 of 3 clinics involving care by 18 clinicians was retrospectively analyzed. Discharge type was operationally defined into 2 discrete categories: normal and abnormal. The results suggested that there was no statistically significant correlation ($p > .05$) between discharge type and any of the following: physical therapist gender, patient gender, patient age, amount of co-pay, physical therapist experience, number of cancelled appointments by patient, number of visits completed, or the number of weeks for total treatment. However statistical significance was found between abnormal discharges and the lumbar spine diagnosis. Statistical significance was also found for average number of visits seen per week per patient. Maintaining a frequency of 2 visits or more per week led to successfully completing the treatment plan 93% of the time with a normal discharge. Further investigation into attendance and treatment success is warranted to optimize patient outcome.

Key Words: attendance, outcomes, compliance

INTRODUCTION

The outcome of a patient's physical therapy treatment in the outpatient setting can be influenced by many variables. Variables such as the age and gender of the patient, diagnosis, compliance with the home program, and/or frequency of visits may play a large part in the end result. The purpose of this study was to determine the relationship of selected clinical variables on discharge success. Identifying the strength of association of these measures with discharge success will help identify indicators that can contribute to "best practice" in the field of physical therapy.

METHODS

Data was collected from 669 discharged patients between the months of January and May 2010. All patients were treated at 1 of 3 clinics involving care by 18 clinicians. Data analysis occurred in June 2010. Therapists were unaware of the study in order to prevent any bias. Each clinician treated their patients autonomously based on an evidence-based approach advocated by each clinic. Once all documentation was completed, signed, and internally audited, the following data were gathered from each patient file:

- Discharge type (normal vs abnormal)
- Patient gender
- Patient age
- Body region treated
- Total visits seen
- Number of cancelled appointments by patient
- Average number of visits seen per week per patient
- Number of weeks actively treated
- Co-pay out of pocket responsibility of the patient
- Physical therapist experience
- Physical therapist gender

Each variable was categorized as nominal, ordinal, or continuous for data entry. JMP version 5.0.1.2 statistical discovery software (SAS Institute, Inc, Cary, NC) was used to enter and explore the data.

Discharge type was broken up into 2 operationally defined categories. They were normal and abnormal.

The operational definition of a normal (or successful) discharge was one where the patient's condition improved to his or her satisfaction, all short- and/or long-term goals were achieved, and discharge was agreeable between patient and clinician. This may include a full return to prior level of function, a partial return to prior level with good understanding between patient and therapist of remaining limitations, or the eventual referral of a patient to the appropriate specialist (eg, orthopaedic surgeon, neurologist, etc). A normal discharge also included a written success story from the patient which is an acknowledgement of the progression of his or her condition from the start of physical therapy to the state of improvement upon the discharge date. This was not a unique variable for the study and represented a normal procedure for the participating clinics.

An abnormal discharge was defined as one where the patient made little or no improvement AND was not a surgical candidate, the patient's condition worsened, the patient self-discharged without meeting clinical goals, or the patient became noncompliant and did not return to therapy.

Patient age was grouped in 10-year increments: 0 to 9 years, 10 to 19 years, 20 to 29 years, and so on. Two patients were under 10 years old, and 4 patients were older than 90.

Body region was defined as the part of the body that was primarily treated. For the purposes of this study, diagnosis was not specified. There were 8 regions categorized as lumbar, cervical, shoulder, knee, hip, foot/ankle, wrist/elbow/hand, and gait/balance.

Total visits seen, total visits cancelled, and total weeks seen were each summed and entered as such.

Physical therapist experience was entered in years and ranged from 0 to 9 years.

Co-pay was defined as the out of pocket expense in dollars incurred by the patient per visit. The following categorical ranges for co-pay were used:

Co-pay Amount in Dollars	Number Assigned to Co-pay Range for Statistical Analysis
$0	1
$1-$10	2
$11-$20	3
$21-$30	4
$31-$50	5
> $50	6

Average number of visits seen per week per patient was calculated by dividing the total number of visits seen by the total number of weeks from initial evaluation to the last visit.

A contingency analysis was then performed to explore the distribution of discharge type across each of the predictor variables of interest. To test for independence of the variables a Pearson Chi Square test of independence was calculated. The p value was established as 0.05.

RESULTS

There were a total of 669 discharges entered, 550 qualified as normal and 119 as abnormal. The percent of normal discharges was 82.2% of total discharges. The variable labeled discharge type was placed in a Fit Y by X model with each other variable in an effort to determine what may contribute to a successful completion of a physical therapy treatment plan.

The results of the statistical analysis suggested there was no statistically significant correlation ($p > .05$) between discharge type and any of the following: physical therapist gender, patient gender, patient age, amount of co-pay, physical therapist experience, number of cancelled appointments by patient, number of visits completed, or the number of weeks for total treatment.

An analysis by body region treated revealed a statistical significance $p = 0.035$ on the Pearson Chi Square statistic between abnormal discharges and the lumbar spine. The percent of abnormal discharges for lumbar spine patients was 25%, compared to an average of 17.8% for all remaining body regions treated.

The greatest statistical significance between any variable and discharge type was that of the average number of visits seen per week per patient, Pearson < 0.0001.

Data on some of the most frequent average number of visits seen per week per patient values are as follows:

Average number of visits seen per week	Successful discharge rate (%)
1.0	48.72
1.33	55.56
1.5	76.92
1.67	69.23
>1.68	92.25
2.0	92.25

From the sample, 251 of the 669 patients were seen 1.67 times per week or less. The successful completion of treatment plan rate for this sample was 64.14%.

A total of 418 of 669 patients were seen 1.68 times per week or greater. This resulted in a successful completion of treatment plan rate of 93.06%.

CLINICAL APPLICATION

The results of this study show a positive correlation between the average number of visits a patient is seen per week and reaching a successful completion of the physical therapy treatment plan as determined by the operational definitions associated with normal and abnormal discharge terms used in this study. Although a number of variables were analyzed, the most significant factor affecting discharge success was frequency of attending treatment. Maintaining a frequency of two visits or more per week led to successfully completing the treatment plan 93% of the time with a normal discharge. We believe that the driving force behind reproducing the desired frequency of treatment each week was patient attendance.

Patients with higher numbers of cancellations or no-shows experienced lower rates of completing their treatment plan with normal discharge. Some research has shown a patient's non-adherence to physical therapy is a multidimensional issue that can affect treatment cost and effectiveness. Several studies have defined many barriers to treatment adherence for outpatient physical therapy.[1,2,3] Jack et al[4] found strong evidence that low levels of physical activity at baseline, poor social support, increased pain during exercise, and other psychological variables such as depression or anxiety were the greatest barriers to successful outcomes. In this study, we did not measure if our physical therapists recognized and helped patients with these issues during treatment thereby influencing their attendance. Low back pain pathologies accounted for 32% of the 669 total patients who were attending therapy. Low back pain was more prevalent in our patients than any other pathology. A lack of specificity in the pathology could lend itself to a greater probability of becoming abnormal when compared to other diagnoses. Furthermore it has been cited that patients who were treated for low back pain showed better results if they were seen early after initial onset.[3,4] Since the time of onset of symptoms prior to initiating the physical therapy program was not included in our data, it is possible that some of the cases may have already become chronic and therefore effected the outcome. Unfortunately, we have no way of knowing if any of these variables (ie, early referral, more specific diagnosis) influenced the data.

It is important to note the relationship between the amount of time a patient's condition has existed and the time elapsed before they seek treatment. In 2012, Fritz et al[1] found that beginning physical therapy immediately after an MD consultation (within 14 days) reduced subsequent health care costs when compared with delayed physical therapy. Initiating a physical therapy program within the first 2 weeks of seeing his or her physician not only made the patient better, but saved the patient and the insurance company money. This is a significant finding that can be used to decrease overall health care spending on things like surgery, injections, advanced imaging, and prescription medications. The study found early physical therapy saved the health care system an average of $2736.23 in medical fees for further management of each individual patient.[1] Comparing this data with the results of our study may suggest a model for frequency and parameters to optimize physical therapy treatment. Those patients who begin physical therapy within 14 days of obtaining a physical therapy referral and are seen at a frequency of twice per week or more are likely to achieve at least 93% successful outcome and save significant additional health care costs.

This issue of chronicity and patient attendance has to be considered when reviewing the results of this study. In 1995, Di Fabio et al[5] found that patients' attendance and the amount of time patients waited to seek care directly affected their ability to get back to work and improve their level of disability. This same claim was found in our study as average number of visits seen per week determined whether the patient successfully completed the treatment plan or not. As physical therapists formulate a plan of care, they are assuming patient attendance will be in accordance with the treatment plan. Our study suggests that in relation to our other data patient attendance is the single most important factor in making sure someone follows through to a completed successful outcome. When a patient is prescribed physical therapy treatments 2 times per week over the course of 6 weeks, the expectation is the patient will be seen for all 12 visits over that 6-week plan. Data from our study shows that if a patient only attends 10 of the 12 visits during a 6-week plan, then an average visit per week total of 1.67 visits over the 6-week plan was achieved. This would result in a 64.14% suc-

cessful treatment plan completion rate. If that same patient attended 11 visits out of the 12 initially prescribed visits over that same 6-week plan, the average number of visits per week would have been 1.83 visits per week with a successful completion rate of 93.06%. This difference supports the importance of maintaining patient attendance even when it means attending one more visit.

While a referral to physical therapy is often dependent on seeing a physician, direct access is one way to allow a patient to get started with therapy as soon as the injury occurs. This option is available in 50 states in the United States at this time. Although the patient bypasses the doctor, there is evidence that supports a physical therapist's importance to act as a "gate keeper" in the health care system. The process is reliant on whether the therapist can accurately define the source of the condition, identify any red flags, and refer the patient to the appropriate specialist as needed. Studies have found that a physical therapist is able to demonstrate competence in differential diagnosis and can coordinate the necessary treatment needed.[5-7] If no red flags are found and the therapist is able to start treatment immediately, the patient has saved time and money. More importantly, the patient may end up with a better outcome.

Achieving an 82% overall successful treatment plan completion rate during the study demonstrated that any given patient (ie, varied diagnoses) was likely to have a favorable outcome. However, those patients who were seen at an average of at least twice per week completed their treatment plan at a rate of 92%. Keeping in mind that the number of visits per week is an average, a therapist can decide to adjust the frequency of visits in order to be sure the average is maintained. It is within the scope of physical therapist practice for the therapist to set and adjust frequency of treatment as part of the plan of care. For example, if a patient is only able to attend therapy once during a particular week, it may be beneficial for him or her to attend 3 times the next week in order to maintain an average of twice per week. The results of this study suggest that controlling the number of average visits a patient attends per week leads to greater outcomes.

The results of this study can be used as a basis for further research. In the future, it may be helpful to break down each normal and abnormal discharge into subcategories based on the definitions presented. A more robust experimental design and statistical analysis may also show a more accurate interplay between variables and their relationship or effect on physical therapy success. Also a 3- and 6-month follow-up could be performed to see if the patient has stayed well or if his or her condition has regressed. Knowing this information can help us better define a patient's true long-lasting effect from physical therapy.

CONCLUSION

The number of treatments a patient attends each week plays an important part in the success of the patient's rehabilitation. Establishing a new patient's treatment frequency at 2 to 3 times a week while ensuring attendance will significantly increase the patient's likelihood of reaching a successful outcome with physical therapy.

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