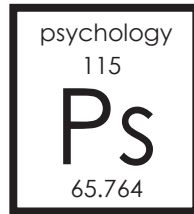




SYMPOSIUM

Student Journal of Science & Math

Volume 2 Issue 1



EXTENDED USE OF FEAR AVOIDANCE BELIEF QUESTIONNAIRES IN PHYSICAL THERAPY TO IMPROVE PATIENT RECOVERY TIME FROM SPINAL SURGERY

A RESEARCH PROPOSAL

by Kady Walker

Project Summary

This experiment aims to use multiple Fear Avoidance Belief Questionnaires (FABQs) for post-surgical female spinal patients for a more comprehensive therapy experience. FABQs are given to quantify and assess the fears and avoidant behavior that a patient may have due to his or her beliefs about movement that may cause pain. The avoidant behaviors could range from the patient unnecessarily limiting daily activities to refusing the physical therapist's recommendations for exercise during the session. It is standard practice in clinics to use a singular FABQ during the initial evaluation for physical therapy. High levels of fear can cause chronic pain and a less successful treatment in therapy. The FABQs are a useful tool, but are usually overlooked. FABQs are often briefly considered, filed in the patient's medical chart, and never looked at again. This is common practice despite research that validates the accuracy of FABQs. This experiment aims to use FABQs four times, instead of just once, through the post-operation (PO) and physical therapy processes to assemble a more thorough program.

The questionnaires will be administered immediately before discharge from the surgical center, at the initial evaluation of physical therapy, during week 2 of physical therapy (PT), and during week 6 of PT. These four scores will differ from the usual protocol of administering only one questionnaire during the initial PT evaluation. The scores, ranging from high to low quantitatively, indicate how much the patients avoid behaviors that they believe could increase their pain. The scores will be categorized for each patient's measurements as high, medium, or low. Each patient's progress will be tracked, and a series of standard discharge tests will be performed at the end of a 12 week PT program. The landmark discharge tests ensure that patients are equipped with the strength and proper technique to go about their daily lives with minimal risk of re-injury. The results of this experiment will be used to determine if high fear avoidance beliefs during a certain point in PT—such as week 2 or week 6—would indicate a significantly decreased ability to pass the standard landmark discharge tests performed at the end of a 12 week program. These landmark tests are used in physical therapy to determine if patients have progressed enough to handle everyday tasks alone without the risk of reinjuring themselves.

From there, further research into preventative measures could be explored to best equip the patients with

the therapy—both physical and psychological—they need for a comprehensive and prompt recovery. These measures could include additional counseling for patients with high avoidance beliefs, scheduling a longer session that includes more one-on-one time with the therapist and aides, and adjusting the length of the program to address patients' fears before they reenter their usual routines.

Introduction

Background

Fear Avoidance Belief Questionnaires (FABQs) are used for patients who have experienced lower back pain (LBP) and are given during the evaluation that precedes PT. FABQs have a list of questions that help medical professionals understand patients' feelings about physical activity and which activities are associated with pain (Wertli et al., 2014). The FABQ is split into two categories: the physical activity section (FABQ-PA) and the section associated with work (FABQ-W). The physical activity section of the FABQ and the patients' fears about general activities correlate, while the work section of the FABQ gauges the patients' feelings about pain caused by their jobs (Chung et al., 2013). The FABQ has a total of 16 questions, each of which asks the patient to rate scenarios on a sliding scale from 0 to 6. Option 0 indicates that the patient completely disagrees with the statement, and option 6 indicates that the patient completely agrees with the statement (Waddell et al., 1993). In past studies, a higher score for each section indicated high avoidant behavior that could negatively affect the outcome of the 12 weeks of PT (Havakeshian & Mannion, 2013). Fear avoidance beliefs lead to abstaining from activities the patient believes will cause pain, which could ultimately lead to disuse, chronic impairment, and in some cases, depression because full healing is no longer achievable (Fujii et al., 2013).

As previously mentioned, FABQs are used to assess the beliefs of patients who have injured their lower back. LBP is a prevalent and serious problem in and out of the workplace. LBP is becoming a large financial burden in the United States despite advances in medical technology (Dagenais et al., 2008). Patients commonly come into physical therapy for post-op LBP. The protocol for PO physical therapy for the lumbar spine is 12 weeks. Patients come into the office 2 to 3 times per week and do a wide range of stabilization and strengthening exercises. These exercises can be seen in Table 1. The sessions will be limited to 90 minutes—the standard amount of time for a LBP physical therapy appointment.

Table 1. Standard exercises used for LBP.

	Exercises
Week 1-6	Wall squats
	Lumbar stabilization exercises
	Push-up progression – Wall to table to chair
	Abdominal crunches beginning at 6 wks post-op – NO Sit-ups
	Treadmill – Walking progression program
	Elliptical trainer
	Stairmaster
	LE stretches – HS, quads, gastroc/soleus, hip flexors
	Back stretches - Knee to chest, supine rotation, piriformis - Prone extension
	May begin lifting and bending using proper biomechanics
Week 7-12	Continue appropriate previous exercises
	Functional training exercises for sports or work specific activities
	Push-up progression – Knees to regular
	Sit-up progression Treadmill – Running progression program

Adapted from (Galland & Kenneth)

At the end of the 12 weeks, the physical therapist will perform a discharge test and rate the patients on their ability to complete several landmark exercises. These exercises include measurements of lumbar spine and hip range of motion in the sagittal plane, a treadmill walking capacity test, and testing of the patient's ability to selectively activate the deep trunk muscles (Mannion et al., 2007). These tests can be seen in Table 2.

Research Problem

FABQs are an incredibly useful tool that many therapists fail to use. The tests accurately depict the beliefs of the patient, which can be used to improve and alter the patient's program structure, lead to more one-on-one time with the therapist, and improve the level of care and discharge rate from clinics. This study aims to use FABQs four times during the recovery process from lower back surgery to observe if, during the six week recovery and twelve week physical therapy, a high score indicates that the patient will have a lower passage rate from landmark tests. With this new information, higher FABQ scores could be analyzed with more significance. This information could allow therapists to assemble a more personalized and comprehensive exercise and recovery program for each patient.

Significance

Lower back pain has been listed as the fifth most common reason that adults visit a physician and has cost the United States upwards of \$100 billion (Chou et al., 2007). Because of the nature of today's society and workforce, human suffering, especially involving LBP, has increased. LBP can cause problems with work, and in turn, with physical and mental well-being. Back pain is the most common reason that employees file for worker's compensation and accounts for 149 million lost workdays per year (Dagenais et al., 2008). Physical therapy clinics need to change the way they address the LBP epidemic to save the US money and workdays, thus creating a more efficient and healthy America.

If the data proves to be significant, the use of multiple FABQs instead of one could help form more individualized and monitored programs for patients with elevated initial scores. FABQ could be used to determine a more adapted program with more one-on-one therapist time. Morning and evening therapy sessions are usually less crowded and allow for more attention from the therapist. Scheduling—an easy fix—could cause a patient's pass rate to increase by weeks. With PT becoming more of a health care necessity, programs that cater to an individual's needs more specifically are required to increase discharge rate and make room for new patients. Addressing the patient's fears would not only help satisfy the patient, but also improve the discharge rate (Asmundson & Norton, 1995). If the patient's FABQ score was still elevated after week 2 and week 6, the patient could be given a psychological counseling referral to make a more comprehensive attempt to address the patient's fears. The use of further therapies for the patient could lead to an earlier release date.

Decreasing the pain that causes fear through psychological therapy leads to a higher endurance and exercise capacity (Gucluhan et al., 2012). With LBP becoming such a prevalent problem in America, a more effective form of physical therapy would lead to a healthier society. Approval for PT would also increase, which could eradicate doctor mistrust in some patients whose results were previously slow or nonexistent. With a more comprehensive view of the patient, suffering and miscommunication could be avoided. Instead of discovering a patient's fears through the therapy, a high initial FABQ score could lead to immediate attention from the physical therapist. An earlier, more in-depth conversation and evaluation could meet the patient's needs sooner rather than later. The therapist could then spend more one-on-one time with the patient, as well as offer more detailed description of challenging exercises and their benefits. The extended use of FABQs could help patients view PT as a valuable resource, not a painful obligation after surgery or injury.

Although it is a more complex process, having multiple FABQ scores could be used for insurance purposes to allocate an appropriate length of treatment, instead of recommending a standard treatment for all LBP patients. This would streamline the insurance process and decrease intercession on the behalf of clinics for more time. With less time spent on the phone, clinics' resources could be redirected to patient care, further fulfilling the priorities of the patient.

Hypothesis

Patients with higher FABQ scores over all four time points will be able to perform fewer standard landmark tests after a standard 12 week PT program than a patient with lower FABQ scores who completed the same program.

Predictions

Higher FABQ scores during week 2 and week 6 of PT will correlate with significantly lower performance on these landmark tests and will indicate the accuracy of FABQ scores and a positive outcome of PT.

Overall, FABQ scores will decrease in each patient, showing fewer fear and avoidant behaviors once the patient has had enough time to adjust to PT.

Project Objectives

Objective 1: FABQ would be used to quantify patients' fear avoidance behaviors and how much these behaviors affect their recovery times.

Objective 2: Landmark discharge tests will be used to determine if high FABQ scores lead to a lowered rate of passage and thus, more time spent in PT.

Objective 3: Test and observe if using multiple FABQs gives any indication that a FABQ given at a particular time—such as week 2—will correlate with a lowered landmark pass rate at the end of PT.

Methods

The first step in the experiment will be obtaining consent from 50 women about to undergo surgery. The patients will all be females aged 45 or older. The patients can undergo the following surgeries to qualify: discectomy, foraminectomy, laminectomy, spinal fusion, or lumbar disc repair. The patients must undergo their surgeries and be discharged in the same week to prevent the experiment from taking too long. There will be N=10 for each score category (high, medium, low). A high score will be a cumulative total of greater than 49/66. A medium score will be a cumulative total of 27-49. A low score would be a cumulative total of less than 27/66.

An FAQB is a questionnaire containing 16 statements that patients rate on a scale for 0 to 6. A 0 indicates that the patient completely disagrees with the statement. A 6 indicates that the patient completely agrees with the statement. The questions are presented in Table 2. The questionnaire is then added up with 96 as the highest possible score. In terms of the study, high scores will be greater than 49 points, medium scores will be from 27-49, and low scores will be less than 27 points. A high score indicates the patient has high fears and avoids physical activity that he or she believes could

increase pain (Waddell et al., 1993). Overall, the FABQ allows the therapist to subjectively see where the patient's fear may lie, and how this could potentially hinder the course of treatment.

Table 2. FABQ statements to be ranked on a sliding scale of 0 to 6 by the patient.

Question	
1	My pain was caused by my physical activity
2	Physical activity makes my pain worse
3	Physical activity might harm my back
4	I should not do physical activities that (might) make my pain worse
5	I cannot do physical activities that (might) make my pain worse
6	My pain was caused by my work or by an accident at work
7	My work aggravates my pain
8	I have a claim for compensation for my pain
9	My work is too heavy for me
10	My work makes or would make my pain worse
11	My work might harm my back
12	I should not do my normal work with my present pain
13	I cannot do my work in my present pain
14	I cannot do my work normally until my pain is treated
15	I do not think that I will be back to my normal work within 3 months
16	I do not think that I will ever be able to go back to work

Adapted from (Waddell et al., 1993).

The FABQ will be distributed at three different clinics with similar sized facilities and one therapist for all patients in each clinic. There will be thirty patients in the experiment, or ten patients at each clinic. The multiple clinics will account for any discrepancies between clinics' or therapists' techniques and insure that the results are only indicative of the FABQ scores (George et al., 2003). Because of the boom in PT over the last 10 years, finding 10 LBP patients at each clinic is feasible.

The FABQs will be administered before discharge from the surgical center, during the initial evaluation, at the beginning of session 5 (after week 2), and at the beginning of session 13 (after week 6). The questionnaire will be given in the therapist's waiting room or in a private office. The patient will be allowed as much time as needed to finish the FABQ. If a patient does not finish the FABQ during the study, he or she will be excluded from the experiment.

Data Collection

One spine clinic with many surgeons will become a facility to recruit patients, perform the surgery, acquire consent for the study, and administer the first FABQ. The surgeon who performs the surgery on a specific person will distribute the FABQs after surgery and before discharging. Therefore, more than one surgeon may administer the first FABQ. The patient will then be transferred to a therapist at

one of the three clinics. The patient will be in communication with the researchers during the 6 week recovery period. The first FABQ will be administered by the physical therapist at each clinic during the initial evaluations, which is the usual protocol. The therapist will continue with the standard 12 weeks of therapy, and administer the FABQs at the beginning of session 5 (after week 2), and at the beginning of session 13 (after week 6).

The discharge tests will be performed by a physical therapist who did not perform the patient's 12 week program. The three therapists will be rotated to a new clinic so no one new therapist will be needed. This will prevent any bias on the patient's performance. The tests are included in Table 2 and would take from 30 minutes to an hour to complete. A pass for each of the exercises indicates that the patient was able to perform the entire test without stopping on the first try. A fail will indicate that the patient was unable to complete the task. Passage rate will be determined by the number of tests the patient passed over the total number of tests.

Table 3. Landmark tests used for discharge in LBP.

Number	Test	Description
1	Stair climbing	Walking up 20 steps of a standard staircase as quickly as possible
2	Prolonged flexion	Bending forward at the hips at a 90 degree angle for as long as possible (180 sec max)
3	Stand-to-floor	Standing to laying down flat on the floor to standing up again
4	Roll up test	Sitting up at a 90 degree angle from laying supine on the floor
5	Pick-up test	Picking up a crumbled piece of paper from the floor from a standing position
6	Sock test	Putting on a loose-fitting pair of socks from a standing position
7	Lift test	5 repetitions of lifting a 5 kg box from the floor and setting it back down
8	Fingertip-to-floor	Bending forward while in a standing position with knees straight and trying to reach the floor with fingertips

Adapted from (Pfingsten et al., 2014).

The FABQs will be collected twice: once after the patient is discharged from the surgical center, and again after the therapist has performed the discharge tests. The second pick-up will include the collection of the four FABQs given during the PT treatment. The questionnaires will not need to be picked up after each distribution because the data is unchanging and easily stored until the completion of the program.

Data Analysis

A G2-test will be run on each time point (4 total). The scores will be binned into pass/fail and high/medium/low scores, which can be seen in Table 3. High scores will be greater than 49 points, medium scores will be from 27-49, and low scores will be less than 27 points. The percentages of passed landmark tests will be averaged. A pass will be considered a score greater than 75% of the average. A fail will be a score less than 60% of the average. For example, if the average pass rate was 82%, a pass rate of 61.5% or greater will be considered a pass. The patients will be tallied into the pass/fail bin into which they appropriately fit. There are 30 participants in this study.

Table 4. Bin 1 of 4 for FABQ scores used for the G-Test.

Post-Op		
	Pass	Fail
Low		
Medium		
High		

A Friedman's test in SPSS Statistics 22.0 will also be run to determine if an individual's score decreased as the experiment and therapy progressed. This would indicate a decrease in fear as the PT progressed. This test is used instead of a repeated measure ANOVA because the data are ordinal. There must be a 95% confidence interval for the data to be significant.

In addition to both of these tests, the change (Δ) in individuals' FABQ scores will be calculated ($\Delta = \text{FABQ final} - \text{FABQ initial}$). This test will compare FABQs to note the overall change of scores among individual patients through recovery and PT progress. An overall delta value from FABQ 1 (initial) to FABQ 4 (final) will be recorded, as well as comparisons from FABQs 1 to 2, 2 to 3, and 3 to 4. The average FABQ values will be presented graphically to illustrate change between individual scores.

Expected Outcome

In past research, the FABQ has had good retesting outcomes and has been a strong predictor of recurring pain (Walker et al., 2014). High FABQ scores in week 2 are expected to directly lead to a lowered pass rate. In addition, a high score in week 2 that persists to the FABQ score in week 6 could be a better indicator of a diminished pass rate. For example, if a patient has the scores of 59, 55, 49, and 43 respectively, he or she would have a lower percentage of pass rates, as indicated by the G2 test.

These scores could be analyzed with all the other patients' data. These results could indicate a very fixable flaw in clinics' FABQ management practices. Positive results may streamline the way physical therapists consider both the physical and mental state of the patient.

The application of this study could change the way therapists treat LBP. If patients' high scores indicate a longer amount of time before discharge, therapists would need to be much more attentive and thorough with those patients. As previously mentioned, LBP is one of the leading causes of insurance claims in America, and the results of this study could lead to more effective treatment for these people in pain. Overall, chronic pain could be greatly diminished by creating a patient program that correlates with their FABQ scores.

Project Timeline and Budget

The project would begin immediately before surgery, which requires a 6 week recovery period before PT. The PT would consist of a standard 12 week program. With data analysis taking one week, the entire experiment would take 19 weeks to complete.

The patients would all undergo surgery and be discharged during week 0. The first FABQ would be administered right before the doctor who performed the surgery discharges the patient. The patients would be required to take a 6 week recovery period, which is standard for most spinal surgeries. After the recovery period, all patients would enter PT within the same week. The first FABQ in PT would be administered on the first day of treatment during the initial evaluation. The 12 week program would begin as detailed in the methods section. The FABQs would be administered during week 2 and week 6. The final FABQ would be administered after the 12 weeks of PT. All of the scores would be analyzed, which would take about one week. This study would be finished at the end of 19 weeks.

Table 5. Projected Timeline.

	Day 0	Weeks 1-6	Weeks 7-18	Week 19
Discharge from surgical center (FABQ 1 given)	X			
Recovery: 6 weeks		X		
Physical Therapy: 12 week program			X * FABQ 2 given at initial evaluation, FABQ 3 given after 2 weeks, and FABQ 4 given after week 6 of physical therapy	
Analysis				X

The supplies needed for the experiment include the questionnaires and gas money, coming to a total of approximately \$5,695.65. There may be a need for interest fliers at the spine clinic, which are already covered in the paper and ink budget. The statistical programs and mileage are also included. The mileage covers round-trips to all three clinics, which would occur once every week of the study.

Table 6. Projected Budget.

Supply	Cost
Stapler/Staples	\$6
Paper	\$8
Ink	\$25
National Standard Mileage Rate	\$0.23 * 20.8 miles = \$7.25 \$7.25* 19 weeks = \$137.66
JMP software	\$1,540
SPSS software	\$2,530
Computer (MacBook Pro)	\$1299
Printer (HP Envy)	\$149.99
Total	\$5,695.65

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