

Provider, Payor, and Patient Outcome Expectations in Back Pain Rehabilitation¹

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Return to work is used routinely to define successful back pain treatment. This study examined how the patient and three professional groups defined success for each of five categories of patients: not sponsored and working, sponsored and working, sponsored on modified duty, sponsored and off work for less than 10 weeks, and sponsored and off work for more than 10 weeks. The groups sampled were treating staff (n = 98), referring physicians (n = 98), third-party sponsors (n = 133), and patients (n = 648) representing all five patient categories. Each group provided a priority ranking for six objectives of treatment: Return to Work, Pain Control, Functional Improvement, Increased Strength and Range of Movement, Positive Attitude Shift, and Acquired Knowledge. The results indicated that the work status of the patient had a significant effect on the ranking of objectives by the treating staff and third-party sponsors. Physicians and patients considered pain control most important regardless of the patient category. Success in back pain rehabilitation is defined by different criteria. The determination of successful outcome must consider the patient's circumstances and acknowledge the perspective of the individual who is defining success.

KEY WORDS: back pain; expectation; outcome; pain control; rehabilitation.

INTRODUCTION

Medical journals frequently document the monetary impact and epidemiology of back pain in industrialized societies (1-4). But as outcome studies become essential research, the need to clarify the term success or outcome becomes paramount. Turk *et al.* (5) cite several studies that define success (6-12), and conclude

¹Poster presentation at the International Society for the Study of the Lumbar Spine, June 14-19, 1993, Marseille, France; North American Spine Society, San Diego, California, October 13-16, 1993; Ontario Physiotherapy Association, Windsor, Ontario, March 2-4, 1994; CPA/APTA Joint Congress, Toronto, Ontario, June 4-8, 1994.

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that there is great variation in the criteria used to establish successful treatment. Some studies have prioritized outcomes using elaborate ranking systems, but out of these reviews (13-17) only one was related to back pain management (18). Hazard *et al.* (19) believe that chronic low back pain patients and their health care practitioners mutually set distinct pretreatment goals for pain, impairment, and disability and judge outcomes accordingly.

Typically, any patient entering a rehabilitation program becomes involved with three professional groups: the physician, therapist, and insurance sponsor. Each patient possesses unique circumstances, and the perception of these circumstances often alters the expectations of treatment. To better understand the effects of expectations regarding definitions of success, we investigated these three groups of professionals and five categories of patient. Our purpose was to determine the taxonomy provided by each sample group for a list of outcome objectives. We hypothesized that different groups would view success in significantly different ways, thereby creating the potential for disagreement as to the success of treatment outcomes.

METHODOLOGY

Sample

Table I lists the four subject groups. In total 977 individuals were sampled. The patient group was subdivided to represent five common patient categories based on whether the patient was responsible for payment of his/her own treatment (not sponsored) or a third party was paying for treatment (sponsored): (1) not sponsored and working full duty, (2) sponsored and working full duty, (3) sponsored and working modified duty, (4) sponsored and off work for less than 10 weeks, and (5) sponsored and off work for more than 10 weeks. Table II defines the objectives, developed by the authors, based upon the presumed objectives of rehabilitation at locations of the Canadian Back Institute (CBI). CBI utilizes an active exercise approach to rehabilitation of back and neck pain. Back education and pain control techniques are rapidly followed by gentle stretching exercises and progressive isotonic strengthening of muscles in the trunk and extremities. Programs include walking, stationary cycling, free weight and machine training, and work conditioning.

Table I. Sample Sizes of the Four Study Groups

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1. Physicians ($n = 98$)—general practitioners, surgeons, and physiatrists that regularly referred patients to the Canadian Back Institute (CBI).
 2. Third-party sponsors ($n = 133$)—representatives of the organizations responsible for payment of rehabilitation costs for claimants treated at CBI.
 3. CBI staff ($n = 98$)—physiotherapists, kinesiologists, and exercise therapists.
 4. Patients ($n = 648$)—individuals actively participating in treatment at CBI during the time of the study.
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Table II. Six Objectives of Treatment at the Canadian Back Institute

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1. Return to work—return to any gainful employment in any capacity regardless of hours or duty.
 2. Pain control—abolition of pain or the patient's demonstrated ability to control or reduce symptoms in a timely manner.
 3. Functional improvement—increased performance in activities of daily living and the improved capacity to sit, stand, or walk in spite of pain.
 4. Increased strength and range of motion—a measured increase in muscular strength and spinal flexibility.
 5. Positive attitude shift—exhibiting a positive outlook with a stated willingness to adhere to and be responsible for the treatment program.
 6. Acquired knowledge—discuss knowledgeable spinal anatomy and pathology, postural techniques, and the principles of exercise.
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Each group comprised a random sample from 18 CBI locations across Canada. Exclusion criteria included limited command of English, a failure to comprehend the descriptions of the stated objectives, or an inability to perform the mathematical process of prioritization of outcome goals.

Procedure

Upon obtaining consent, interviews were conducted with individuals in each group including individuals in each of the five categories of patients. Each group was asked to prioritize the six objectives of treatment according to their own situation. Participants were instructed to estimate the significance of each objective as a percentage of the total. Equal percentages for any number of the objectives were permitted, but the total could not exceed 100%.

The referring physicians provided rankings and estimation of the significance of each objective as a percentage of the total for the six objectives, based on what they expected their patients to accomplish with treatment. To expedite the interview with this group where contact was limited by time constraints on their availability, physicians were asked to consider only two categories of patient: those at work with back pain and those not working because of back pain.

Third-party sponsors followed a similar procedure, but were required to provide separate rankings for four patient categories. Sponsors did not comment on the not sponsored and working patient. Return to Work, for the sponsored patient on modified duty, was defined as a return to full employment.

The treating staff (including physiotherapists, kinesiologists, and exercise therapists) carried out the same ranking procedure for all five categories of patients. Their answers were to reflect their expectations of the patients' accomplishments.

ANALYSES

Data for this type of study is not considered to be normally distributed. It is bounded by 0 and 100 and constrained to add up to 100%. It also spans an order of magnitude. We transformed the data using an empirical logit transformation before

applying analyses which work on normally distributed data. The logit transformation is: $\ln [R/100 - R]$ where R is the weight out of 100 assigned to each category and \ln is the natural log. Because this equation is undefined when R is equal to either 0 or 100, a correction factor is added and logit becomes: $\ln [R + 1/2 / 100 - R + 1/2]$.

Following transformation, the initial analysis was a three-way multivariate analysis of variance (MANOVA). This was a 4 (Group = physician, sponsor, staff, patient) \times 5 (Patient Type = not sponsored and working full duty, sponsored and working full duty, sponsored and working modified duty, sponsored and off work for less than 10 weeks, sponsored and off work for more than 10 weeks) \times 6 (Treatment Objective = return to work, pain control, functional improvement, increased strength, positive attitude shift, acquired knowledge) MANOVA (Wilke's Lambda test statistic) to determine if the six responses differed significantly depending upon the identity of the respondent and/or on the category of patient being considered. If a significant multivariate effect was found then a univariate analysis of variance (ANOVA) was done to determine whether the various responding groups differed in their ratings of the six objectives based on the type of patient. Finally, a Tukey's multiple comparison test, using an alpha level of 0.05, was used to determine exactly where the significant difference lay. The mean values presented in Tables III and IV are of the transformed data and, therefore, do not add up to 100%.

RESULTS

Physicians

The priority ranking of the objectives by the physicians is summarized in Table III. Because each doctor provided two sets of responses, the analysis was a repeated

Table III. Priority Ranking and Mean Percentage^a of Rehabilitation Objectives by Physicians

Category of patient	
Working	
1. Pain control	33.1%
2. Functional improvement	16.3%
3. Acquired knowledge	11.9%
4. Positive attitude shift	10.3%
5. Increased strength and range of motion	10.2%
6. Return to work	2.0%
Not working due to injury	
1. Pain control	24.1%
2. Return to work	21.8%
3. Functional improvement	12.4%
4. Positive attitude shift	9.1%
5. Acquired knowledge	8.6%
6. Increased strength and range of motion	8.5%

^aPercentages represent transformed data and thus do not add up to 100%.

measures design to determine if an objective was rated differently for working versus non working patients. MANOVA results showed a significant main effect due to patient type, working vs. not working ($F_{6,90} = 16.67, p < 0.0001$).

Taking the repeated measures aspect of the data into account, doctors gave significantly different weights to every goal ($p < 0.005$) except Positive Attitude Shift for the two groups, working and nonworking patients.

The priority ranking of the objectives from the third-party sponsors, staff, and patients are depicted in Table IV and detailed ANOVA results for each rating group are summarized in Table V.

Third-Party Sponsors

The sponsor responses were analyzed in a similar manner as those from the doctors. That is, four responses were given from each sponsor, one response for each type of patient. The MANOVA indicated a significant effect of type of patient on the ratings supplied by the sponsors ($F_{3,360} = 7.62, p < 0.0001$).

Individual ANOVA results revealed that third-party sponsors gave significantly different weightings for all objectives ($p < 0.001$) except Pain Control and Increased Strength and Range of Motion.

Among sponsors, Tukey's multiple comparison test showed that there was no significant difference between each type of patient and of the objectives Pain Control, and Increased Strength and Range of Motion.

Canadian Back Institute Staff

The staff responses were analyzed in a similar manner as those from the sponsors with the addition of one other type of patient, not sponsored and working. MANOVA results for staff responses indicated that patient category had a significant effect on the ratings ($F_{24,1309} = 37.85, p < 0.0001$).

The results of the individual ANOVAs indicate that the staff gave significantly different weights to each goal for each of the five different groups of patients ($p < 0.0001$ for each objective).

Among Staff, Tukey's multiple comparison test showed that there was no significant difference between each type of patient and of the objectives Pain Control, Functional Improvement, and Positive Attitude Shift.

Patients

The patients' ratings did not require a repeated measure analysis, because each patient gave only one response. MANOVA results indicated that there was a significant difference in responses between the five patient categories ($F_{24,2223} = 4.87, p < 0.0001$).

Individual ANOVA results for patient responses revealed that there was a significant difference for all objectives due to the type of patient ($p < 0.05$). Thus,

Table IV. Priority Ranking and Mean Percentage of Rehabilitation Objectives by Subject Group

Third-Party sponsors	Canadian Back Institute Staff		Patients		
	Priority Ranking	Mean Percentage	Priority Ranking	Mean Percentage	
1. Pain control 2. Functional improvement 3. Increased strength and range of motion (ROM) 4. Return to work 5. Acquired knowledge 6. Positive attitude shift	Sponsored and working 1. Pain control 2. Acquired knowledge 3. Functional improvement 4. Increased strength and ROM 5. Positive attitude shift 6. Return to work	13.2%	26.4%	1. Pain control	29.8%
		11.3%	22.8%	2. Functional improvement	15.2%
		9.0%	14.7%	3. Increased strength and ROM	12.3%
		6.0%	12.3%	4. Acquired knowledge	10.4%
		5.6%	6.3%	5. Positive attitude shift	4.6%
		5.0%	0.4%	6. Return to work	1.9%
1. Functional improvement 2. Return to work 3. Pain control 4. Increased strength and range of motion (ROM) 5. Positive attitude shift 6. Acquired knowledge	Sponsored on modified duty 1. Functional improvement 2. Pain control 3. Acquired knowledge 4. Increased strength and ROM 5. Return to work 6. Positive attitude shift	17.4%	20.1%	1. Pain control	36.7%
		14.8%	17.2%	2. Return to work	13.4%
		10.5%	15.6%	3. Functional improvement	11.4%
		8.7%	11.3%	4. Increased strength and ROM	6.1%
		4.7%	7.8%	5. Acquired knowledge	5.5%
		4.5%	6.0%	6. Positive attitude shift	2.7%
1. Return to work 2. Functional improvement 3. Pain control 4. Increased strength and range of motion (ROM) 5. Positive attitude shift 6. Acquired knowledge	Sponsored and off work less than 10 weeks 1. Return to work 2. Pain control 3. Acquired knowledge 4. Functional improvement 5. Increased strength and ROM 6. Positive attitude shift	19.8%	27.4%	1. Pain control	23.2%
		12.1%	16.7%	2. Return to work	14.7%
		10.4%	13.2%	3. Increased strength and ROM	10.5%
		7.2%	12.5%	4. Functional improvement	8.9%
		7.1%	7.8%	5. Acquired knowledge	5.3%
		4.3%	5.3%	6. Positive attitude shift	2.9%

Table V. ANOVA Results of the Four Subject Groups for Six Rehabilitation Objectives

Objective		p-value
Physicians		
	$F_{1,95}$	
Return to work	89.23	<0.0001
Pain control	26.27	<0.0001
Functional improvement	16.87	<0.0001
Increased strength and ROM	8.46	0.0045
Positive attitude shift	1.64	0.2039
Acquired knowledge	23.50	<0.0001
Sponsors		
	$F_{3,360}$	
Return to work	7.62	<0.0001
Pain control	1.14	0.3346
Functional improvement	5.56	0.001
Increased strength and ROM	2.60	0.0522
Positive attitude shift	5.97	0.0006
Acquired knowledge	4.69	0.0032
Staff		
	$F_{4,380}$	
Return to work	279.16	<0.0001
Pain control	61.34	<0.0001
Functional improvement	9.21	<0.0001
Increased strength and ROM	12.48	<0.0001
Positive attitude shift	14.42	<0.0001
Acquired knowledge	28.56	<0.0001
Patients		
	$F_{4,642}$	
Return to work	21.88	<0.0001
Pain control	2.43	0.0468
Functional improvement	3.00	0.0179
Increased strength and ROM	3.41	0.009
Positive attitude shift	2.44	0.0457
Acquired knowledge	3.02	0.0175

ANOVA analysis revealed a significant difference in the ratings due to the patient's circumstances.

The multiple comparison test often placed all of the patients in the same grouping. This is a common occurrence since ANOVA results showed that the patient groups did not consider all of the objectives equal in value, but Tukey's test did not detect a significant difference between all of the patient groups for some of the objectives.

Working vs. Nonworking Patients

A further analysis was done to determine whether the physicians, sponsors, staff, and patients differed in their weightings of the variables for the different categories of patients. This analysis involved the determination of a significant interaction between the patient category and the rating group. Significant interaction indicates that the ratings given depend upon the circumstances of the patient being

considered. After subdividing patients based on employment status, comparison of the working and nonworking patients revealed that the interaction between the rater and the employment status of the patient was significant for the variables, Return to Work ($F_{3,1811} = 31.19, p < 0.0001$), Pain Control ($F_{3,1811} = 10.15, p < 0.0001$) and Positive Attitude Shift ($F_{3,1811} = 6.97, p < 0.0001$). The difference in ranking these objectives for working vs. nonworking patients depended upon the group providing the weighting. Table VI separates the data into two datasets, one for each type of patient, for the variables where the interaction between rater and type of patient was significant.

Patients Utilizing a Third-Party Sponsor

The ratings for all patients, not responsible for payment of treatment, were compared. Again, there were significant interactions between the patient category and the rating group for Return to Work ($F_{6,1424} = 10.71, p < 0.0001$), Pain Control ($F_{6,1424} = 9.35, p < 0.0001$), and Positive Attitude Shift ($F_{6,1424} = 3.12, p < 0.005$). Table VII displays the significance values by type of sponsored patient.

All Patients

Patient responses demonstrated a significant interaction between the patient category ($F_{4,1119} = 10.33, p < 0.0001$) and the rater ($F_{4,1119} = 171.39, p < 0.0001$) for all objectives ($p < 0.05$) except Knowledge. The staff scored the importance of knowledge significantly higher (mean = 17.2) than did the patients (mean = 5.6) in all categories.

DISCUSSION

Our findings show a statistically significant divergence of opinion among physician, sponsor, staff, and patient expectations of a rehabilitation program. This coincides with the research of Strupp and Hadley (20), who concluded that what constitutes a successful outcome will depend upon who is asked.

Not surprisingly, patients from all five categories considered Pain Control as the most important determinant of success. Turk *et al.* (5) stated that patients often disagree with health care providers and third-party payors as to the most important presenting problem. Our findings were similar to those of Colvin *et al.* (21) and Fitzpatrick *et al.* (22) who found that the majority of patients desired total and permanent relief of pain as their primary goal.

The patients' enthusiasm for Pain Control was not shared by the treating staff and the third-party payor. This discrepancy requires resolution early in the rehabilitation program to avoid patient dissatisfaction and self-termination of treatment. Carosella *et al.* (23) found a significant correlation between high pain intensity and patients who did not complete a comprehensive back pain rehabilitation program. For patients who cannot achieve pain control, treatment planning will involve either

Table VI. Mean and p-Values by Employment Status for the Three Objectives Where the Interaction Between Rater and Type of Patient was Significant

Rater	Pain control						Positive attitude shift								
	Return to work			Nonworking			Working			Nonworking			Working		
	Mean	Rater	Mean	Rater	Mean	Rater	Mean	Rater	Mean	Rater	Mean	Rater	Mean	Rater	Mean
Staff	27.5	Sponsor	9.7	Patient	26.2	Physician	33.1	Physician	9.1	Physician	9.1	Physician	10.3	Physician	10.3
Physician	21.8	Patient	4.2	Physician	24.1	Patient	32.4	Staff	7.8	Staff	7.8	Staff	5.8	Staff	5.8
Sponsor	19.4	Physician	2.1	Sponsor	10.6	Staff	24.3	Sponsor	7.5	Sponsor	7.5	Sponsor	4.9	Sponsor	4.9
Patient	13.3	Staff	1.4	Staff	9.5	Sponsor	11.8	Patient	3.1	Patient	3.1	Patient	4.1	Patient	4.1
$F_{4,1119}$	p -value	$F_{4,1119}$	p -value	$F_{4,1119}$	p -value	$F_{4,1119}$	p -value	$F_{4,1119}$	p -value	$F_{4,1119}$	p -value	$F_{4,1119}$	p -value	$F_{4,1119}$	p -value
12.46	<0.00001	31.57	<0.00001	45.2	<0.00001	36.11	<0.00001	37.31	<0.00001	12.39	<0.00001	12.39	<0.00001	<0.00001	<0.00001

Table VII. p-Values of Sponsored Patients for the Three Objectives Where the Interaction Between Rater and Type of Patient was Significant

Objective	Type of patient							
	Off work <10 weeks		Off work >10 weeks		On modified duty		Working full duty	
	$F_{2,407}$	p -value	$F_{2,499}$	p -value	$F_{2,262}$	p -value	$F_{2,256}$	p -value
Return to work	6.02	0.0027	10.27	<0.00001	3.3	0.0383	20.09	<0.00001
Pain control	15.35	<0.00001	61.71	<0.00001	18.33	<0.00001	10.32	<0.00001
Positive attitude shift	15.4	<0.00001	35.99	<0.00001	5.42	0.005	0.88	0.4178

the institution of an alternate pain management approach or behavior modification to establish more realistic goals.

Physicians surveyed did not consider Increased Strength and Range of Motion as important, ranking it low for both the working and nonworking patient. Combined with their emphasis on Pain Control, it is apparent that pain takes precedence over strength in the general medical view of rehabilitation.

Patients and Third-Party Sponsors ascribed a low value to Acquired Knowledge or Positive Attitude Shift, and ranked them last for all patient categories. Conversely, the treating staff regarded Acquired Knowledge as highly valuable. This staff opinion may reflect the imposed program direction and the effort required to provide dynamic education in back pain rehabilitation. Patients and Sponsors may regard these goals as less important because of a perceived lack of direct application to the immediate problem of return to work and pain control. Further research is required to determine the effect of these two objectives on outcome.

The treating therapists saw very little difference between the "not sponsored and working" and the "sponsored and working" patient for all of the objectives and perceived the need for Functional Improvement as more important than Increased Strength and Range of Motion. Although the latter is a necessary prerequisite of the former, Increased Strength and Range of Motion was apparently viewed merely as a means to an end and not as a goal itself.

Our analysis of the ranking of objectives by the CBI Staff and the Third-Party Sponsors revealed that those who treat and those who pay adjusted their goals depending upon whether the patient was at work. Staff and Sponsors viewed Return to Work and Functional Improvement as the most important objectives when the patient was not working. When the patient was regularly employed, Pain Control and Functional Improvement took precedence.

While all the groups of responders considered certain goals to be very important, they did not unanimously choose a single objective as paramount. Increased Strength and Range of Motion, Positive Attitude Shift and Acquired Knowledge were scored low by at least half the raters in each group. For working patients, "Return to Work" did not equal 0%. In some cases it ranked higher than a few other objectives. Patients who had regular employment apparently viewed their ability to stay at work as an important objective of treatment.

CONCLUSION

The determination of a successful rehabilitation outcome cannot view all patients identically and should not use return to work as the only criterion. The work status of the patient and the perspective of the individual defining success both need consideration. Based on the findings in this study, recognizing a patient's specific circumstances allows prediction of their expectations. The potential for disagreement, between physician, sponsor, staff and the five categories of patients, as to the success of treatment is evident.

A definition of success by an involved party should be part of any study measuring patient outcomes. This study has shown that success is difficult to define and

far from homogeneous. Success of a rehabilitation program should clearly state both the mutual and conflicting goals of the patient, clinician, and interested third party. Recognition of patient priorities and their variance from the stated program objectives is essential for effective goal setting. It is recommended that the definition of success should encompass three distinct measures: pain reduction, improvement in function, and return to work.

ACKNOWLEDGMENTS

The authors acknowledge the help of: Lynda Wilson for manuscript review; Ruth Croxford and the Department of Statistics (University of Toronto) for data analyses; Geoff Bowman, Rob Karas, Jeff Plunkett, and the staff at each location of the Canadian Back Institute for data collection.

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