PAIN ATTITUDES AND BELIEFS: A DESCRIPTIVE STUDY OF ORTHOPAEDIC PHYSICAL THERAPISTS

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER I

INTRODUCTION

Background

Pain and disability are symptoms common to many individuals with acute and chronic health problems who present for physical therapy.[1] As such, the appropriate management of patients with pain and disability is clinically relevant to physical therapists.

Evidence suggests that the attitudes and beliefs of health care providers play an important role in the persistence of patients' pain complaints by influencing their treatment behavior.[2,3] Insomuch, the totality of a person's beliefs acts as the information base which determines his or her behavior.[4] Consequently, beliefs about pain will influence a person's health-related behavior, whether that person is the patient experiencing the pain or the health professional managing it.[5]

Nevertheless, most pain attitudes and beliefs literature is patient focused, and only a few studies which address the pain beliefs of physical therapists exist.[6,7,8] Currently, there is little research that examines the United States (U.S.)

orthopaedic physical therapists who evaluate and treat a variety of pain conditions.[9,10]

Problem

There is limited research concerning U.S. orthopaedic physical therapists' knowledge, attitudes or beliefs regarding pain. Therefore, gathering data on this topic may help guide educational efforts and improve therapists' approaches to the management of pain in outpatient orthopaedic settings.

Purpose

The purpose of this descriptive study was threefold. First, the study was designed to describe the explicit attitudes practicing orthopaedic physical therapists hold in regard to the current clinically relevant knowledge relating to pain and its management. This information was being collected to determine if there were any potentially undesirable attitudes therapists have toward evaluating and treating patients with nonmalignant pain. Second, the study was designed to describe the beliefs these therapists possess in regard to the evaluation and treatment of patients with acute/subacute and chronic pain. This information was being collected to identify any potentially limiting beliefs these therapists exhibit when approaching the evaluation and treatment of patients with nonmalignant pain. Third, this study sought to replicate findings appearing in a 1991 study by Melissa Wolff.[9] This information was examined to better understand two specific issues. First, how knowledgeable the respondents felt in dealing with clinical pain

conditions as entry-level therapists and second, the current preferences therapists have in regard to treating patients with nonmalignant pain.

Hypotheses

Since this was a descriptive study and limited to a small sample of practicing outpatient orthopaedic physical therapists, no inferences could be drawn from this research. However, the following outcomes were expected:

1. There will be a statistically significant relationship between the physical therapists' background information and the degree of favorable/unfavorable responses to the attitudes portion of the survey. As a result, as education and clinical experience improves, the tendency to respond favorably to the survey questions increases.

2. There will be a statistically significant relationship between the physical therapists' background information and the degree of favorable/unfavorable responses to the beliefs portion of the survey. Hence, as education and clinical experience improves, the tendency to respond favorably to the survey questions increases.

3. There will be a statistically significant relationship between the physical therapists' background information and preparedness in treating patients with pain. So, despite differences in education or clinical experience, the survey would

demonstrate a tendency for most orthopaedic physical therapists to feel unprepared in dealing with clinical pain conditions as entry-level therapists.

4. There will be a statistically significant relationship between the physical therapists' background information and preference in treating patients with pain. On that account, despite differences in education or clinical experience, the survey would demonstrate a tendency for most orthopaedic physical therapists to prefer working with patients with acute/subacute pain versus chronic pain.

Definition of Terms

Knowledge is the 'factual' component of information[11] that includes:

Biomedical knowledge i.e. 'what is known or believed in the basic sciences particularly as it relates to anatomy, pathomechanics, pathophysiology, psychology, pain mechanisms and healing'.[12]

Clinical knowledge i.e. 'knowledge such as clinical patterns and if: then guides to action which clinicians use on a day to day basis with or without a sound biomedical basis'.[12]

Attitudes are 'psychological representations of societal and cultural influences which organize beliefs around an object or situation and predisposes an individual to respond in a particular way'[13] either positively or negatively. Attitudes are typically measured on questionnaires employing a Likert scale.

Explicit attitudes refer to attitudes which 'originate from a deliberate weighing of relevant aspects of an attitude object and are measured best with self-report questionnaires'.[2]

Belief is defined as 'the information known about an object and representing a person's personal knowledge or understanding of that object'.[14]

Pain is the 'unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'.[15]

Acute pain is 'pain during tissue damage and healing. For most injuries and conditions, an arbitrary figure of up to 6 weeks tends to be used'.[16]

Subacute pain is 'pain experienced while the healing process is resolving. The arbitrary figure of six to twelve weeks tends to be used'.[16]

Chronic (persistent) pain is defined as 'pain outlasting the time in which completion of the healing process is expected. The arbitrary figure of more than three months tends to be used. The term may also be used for ongoing pain not caused by a lesion'.[16]

Nonmalignant pain is defined, for the purpose of this study, as pain unrelated to diagnosed cancer, metastases or for the medical treatment of such.

Pain tolerance refers to 'the greatest level of pain a subject is willing to tolerate'.[16]

Pain beliefs are 'any person's thoughts about what pain is and what it means to them'.[5]

Pain behaviors are 'all outputs of the individual that a reasonable observer would characterize as suggesting pain'.[17]

Suffering is considered to be 'the emotional reaction to pain even when the sensory quality of pain remains unchanged'.[18]

Chapter Summary

Health care providers treat a variety of patients suffering from pain. The attitudes and beliefs of health professionals including physical therapists may impact the care these patients receive. Nonetheless, there is sparse research examining the attitudes and beliefs of outpatient orthopaedic physical therapists practicing in the U.S.

This chapter presented a brief background for and purpose of this study. The four hypotheses were given and significant terms were defined. The next chapter will present a review of the literature relevant to this study.

CHAPTER II

REVIEW OF THE LITERATURE

The literature review summarizes existing research in the study of pain theory and its management. Previous research questions are cited and examined in relation to their influence and support for the survey questions appearing in this thesis. A general explanation for each survey item is provided, but the reader is encouraged to see Appendix A for more detail.

Part A: Attitudes

A common finding in the literature is that health professionals' pain management knowledge and/or attitudes are inadequate.[19-31] Furthermore, there is increasing evidence that suggests cognitive and affective variables are more potent determinants of disability and not the intensity of pain itself.[32,33,34] Altogether, these findings have implications toward analyzing the knowledge and attitudes of health care professionals in treating people with pain.

The International Association for the Study of Pain (IASP) defines pain as the 'unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'.[15] While this defini-

tion seeks to label the sensory and emotional aspects of pain as a subjective experience, there is debate on how to best interpret this particular definition of pain. Donald D. Price, PhD from the University of Florida submits:

"It is not at all clear from whose point of view such an association exists: is it based on the judgment of an outside observer or on the experience of the person in pain? Although this most likely was not the intention of its authors, the definition could be understood to imply that if an observer (e.g., a health care professional) cannot determine an association between the reported experience and actual or potential tissue damage, then the experience is not that of pain".[35]

McCaffery and Pasero[36], however, define pain as whatever the experiencing person says it is, existing whenever he says it does thereby removing the health professional's opinion of whether or not actual or potential tissue damage is present. Hence, according to the United States Acute Pain Management Guideline Panel, the patient's self-report of pain is the 'single most reliable indicator of the existence and severity of pain'.[37] That being the case, clinicians are discouraged from using either behavioral or vital signs instead of the patient's self-report to validate pain.[37]

Evaluating knowledge and attitudes toward pain and its management is a beginning step in caring for patients with pain. In the Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP), McCaffery and Ferrell[38] ask the question:

"The most accurate judge of the intensity of a patient's pain is

a. The treating physician b. The patient's primary nurse c. The patient d. The pharmacist e. The patient's spouse or family"

In general, their findings indicate that nurses lack appropriate pain knowledge; however, with continuing educational efforts, improvements are being made.

Rochman[39] examines common myths regarding the assessment of persons with pain. This study of occupational therapy students' includes four attitudes toward pain assessment that may be misunderstood. One item discusses the issue of pain tolerance and reads:

"The more prolonged the pain or the more experience a person has with pain, the better his tolerance for pain."

Another survey question inquires about the nature of pain and reads:

"Pain is largely an emotional or psychological problem, especially in the patient who is highly anxious or depressed or who has an unclear physical cause of pain."

The concepts of credibility and malingering also appear and read as follows:

"Our personal values and intuition about the trustworthiness of others is a valuable tool in identifying whether a person is lying about pain."

"Lying about the existence of pain, malingering, is common."

Incidently, if one trusts that the 'most reliable indicator of pain is self-report'[37], then one could logically conclude that the concept of malingering is invalid. The above items indicate areas of misinformation and inappropriate attitudes. Moreover, the study encourages additional organized effort to improve the pain knowledge and attitudes of these health professionals.

Ostelo et al[40] concludes, in their survey, that attitudes and the treatment orientation of health care providers are important considerations in managing patients with chronic low back pain. Two survey items presented in the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT)[40] discuss the issues of research regarding the cause of back pain and the idea of what determines pain level. Those read:

"Not enough effort is made to find the underlying cause of back pain."

"The severity of tissue damage determines the level of pain."

The researchers hypothesize that while respondents tended to largely disagree with the latter, a wide variation of responses to the former item indicates inconsistency when managing people with chronic low back pain. And thus, these attitudes may affect patient care.

Wolff[9] also discusses the pain knowledge and attitudes of physical therapists treating patients with chronic pain. One question examines pain behavior

and reads:

"The most likely reason for a patient with a chronic pain syndrome to demonstrate pain behavior to the therapist (limping, moaning, wincing) is...

a) the patient is afraid of appearing well.

b) to get sympathy.

c) the patient does not want to comply with the treatment program.

d) in the past the patient received reinforcement for such behavior."

In addition to the areas addressed so far, previous research indicates that patient education regarding pain neurophysiology changes a patient's pain beliefs and physical performance and could thus be a beneficial approach to pain management.[41] Thus, knowledge of pain mechanisms, and the ability to educate patients regarding these appears useful to health professionals.

And finally, Klaber Moffett[42] suggests that any kind of passive therapy might be responsible for creating unnecessary dependence on therapists and their treatment instead of promoting the role of the patient in self-management. This too has important implications in the management of people with pain by encouraging therapists and patients to actively contribute to the therapeutic process.

The literature supports questions 1-13 of the attitudes section for this research study. The first question of the survey addresses the physical therapist's attitude toward the IASP definition of pain. The participant's attitude concerning

the most accurate judge of a patient's pain level is examined in the second question. The third item of the survey analyzes the concept of pain tolerance. Pain and its relationship to disability are discussed in the fourth question. The fifth item of the survey inquires about the physical therapist's attitude concerning whether or not the severity of injury determines one's pain level. Chronic pain is examined in the sixth question. Question 7 addresses the therapist's attitude concerning credible pain reports. The eighth item of the survey inquires about the efforts being made to find the cause of chronic pain. Question 9 seeks to identify the respondent's attitude toward the concept of malingering. The physical therapist's attitude toward pain behavior is discussed in question 10. The eleventh item of the survey determines if the respondent feels confident in educating patients about pain neurophysiology. Question 12 examines the issue of passive therapy. Lastly, the respondent's attitude concerning health professionals' knowledge of pain management is addressed in question 13.

Part B: Beliefs

Turk and Meichenbaum[43] mention that health and illness beliefs play an important mediating role between persistent pain and its functional impact. Likewise, evidence suggests that establishing a patient's pain beliefs early in the therapeutic process may improve patient outcomes.[5]

Two issues presented in the literature involve the role of religious beliefs in managing pain and the concept of pain over reporting.

McCaffery and Ferrell[38] ask:

"Based on one's religious beliefs a patient may think that pain and suffering are necessary."

"What do you think is the percentage of patients who over report the amount of pain they have?

a. 0% b.10% c. 20% d. 30% e. 40% f. 50% g. 60% h. 70% i. 80%"

Whereas research in the area of religion and the pain experience is limited, Cervantes and Lechuga[44] report that inquiry into a patient's spiritual and religious beliefs 'could provide many meaningful clues as to how pain is perceived and how to assist the patient in managing it'.[44] However, the idea of over reporting pain is typically viewed as invalid if one assumes that the self-report is the most reliable measure of pain intensity.[37]

Generally, clinicians are advised to trust the self-report versus behavioral or vital signs when validating pain.[37] Moreover, Rochman[39] addresses this idea by asking:

"Visible signs, either physiological or behavioral, accompany pain and can be used to verify its existence and severity."

Another area of concern is pain beliefs and job satisfaction. Feuerstein and Beattie[45] describe various biobehavioral factors, i.e. cognitive-perceptual, environmental-behavioral and psychophysiological factors and their possible impact

on physical therapy outcomes and conclude that 'the presence of perceived workplace problems can impede rehabilitation efforts directed at functional restoration and return to work'.[45]

Hankin et al[46] suggests that patients in outpatient physical therapy clinics might demonstrate behavioral, affective and cognitive characteristics of chronic pain. That study supports the conclusion that the West Haven-Yale Multidimesional Pain Inventory (MPI) is a useful screening tool for determining which patients could benefit from being referred to multidisciplinary treatment.

Mikail et al[47] further acknowledges that as a whole, the MPI, the Beck Depression Inventory (BDI) and the McGill Pain Questionnaire (MPQ) are the instruments that could 'best capture chronic pain patients' level of emotional adjustment, functional ability, and perceptions of pain, without extensive overlap'.[47]

Also of interest is how chronic pain affects a patient's family, friends and social network and thus impacts a patient's recovery.[48,49] In accordance with this, Wolff[9] inquires:

> "Evaluating the need to involve a chronic pain patient's "significant other" in the rehabilitation process is a necessary component of the physical therapy program.
>
> a) Agree completely b) Agree somewhat c) Disagree somewhat
>
> d) Disagree completely"

On another note, sexuality is discussed within the available literature of pain management. Sexual function is considered an important domain of quality of life[50] which is vulnerable to disruption through illness and injury, including chronic pain.[51,52] Ambler et al[53] finds that there is a high prevalence of sexual difficulties in patients with chronic pain and that the range of problems suggests that multidisciplinary intervention is needed.[53]

Finally, Jones, Edwards and Gifford[54] emphasize the importance of understanding and managing the biomedical and biopsychosocial aspects behind patients' problems. This implies that patient and clinician should address limiting beliefs regarding pain prior to initiating treatment since those beliefs may become obstacles later in the process.[54] They believe that 'the ability to examine underlying assumptions behind the beliefs and actions of both therapist and patient opens the way to more constructive forms of communication and collaboration'.[54,55]

The research supports questions 14-25 of the beliefs section for this survey. The fourteenth item of the survey discusses the participant's belief regarding pain over reporting. The concept of trusting pain behaviors to verify pain is addressed in item 15. Questions 16, 17 and 19 discuss establishing a patient's pain beliefs. The eighteenth item of the survey is based on the research concerning how work environment problems may interfere with therapeutic outcomes. Question 20 examines the idea of asking the significant other's reaction to the patient's complaint of pain. Utilization of the MPI is addressed in question 21. The use of the

BDI and MPQ is analyzed in items 22 and 23 respectively. Question 24 of the survey examines whether the respondent inquires about a chronic pain patient's sexual functioning. Lastly, the final question of the beliefs section addresses the relationship between pain beliefs and spirituality.

Part C: Background Information

A survey of accredited physical therapy programs in North America reveals that while the modal amount of time spent on pain is four hours, the majority of faculty think pain is adequately covered in the curriculum.[1] Furthermore, the perceptions of the graduates' competency to assess and treat individuals with pain are generally satisfactory and higher for acute versus chronic pain.[1]

Similar to the above, Wolff[9] examines three concepts involving the preparedness, satisfaction and patient preference of orthopaedic physical therapists. The questions read:

> "How well did the pain management and theory information you received during your entry level training prepare you for the orthopaedic patient population you treat?
>
> a) Adequately to deal with most clinical pain conditions.
>
> b) Less than adequately to deal with most clinical pain conditions.
>
> c) Extremely inadequately to deal with most clinical pain conditions."

"How satisfied are you with your current level of knowledge in regard to pain management and theory?

a) Very satisfied

b) Somewhat satisfied

c) Somewhat unsatisfied

d) Very unsatisfied"

"How do you feel about working with patients with chronic pain versus other patients you treat who do not have chronic pain?

a) I prefer to treat patients with chronic pain over patients with acute/subacute pain.

b) I prefer to treat patients with acute/subacute pain over patients with chronic pain.

c) I do not have a preference for treating patients in regard to their pain."

The questions listed above support items 30, 31 and 36 of the survey respectively. Although not listed here, Wolff[9] also discusses the topics of therapist education, orthopaedic experience, pain clinic employment and continuing education. These concepts are examined in questions 27, 29, 32 and 33. Concepts not included by Wolff[9] are items 26, 28, 34 and 35 of the survey. These identify the respondent's gender, physical therapist (PT) experience, pain organization membership and IASP familiarity respectively. It is the opinion of the researcher

that these topics are important considerations when describing the overall scores and distributions of the sample.

Chapter Summary

When it comes to pain theory and management, the attitudes and beliefs of outpatient orthopaedic physical therapists are largely unknown. Most of the research cited indicates a general lack of knowledge or unfavorable attitudes concerning pain within the various health professions.

This chapter listed and briefly explained the survey questions utilized for this study. Previous research examples were cited alongside each concept and discussed. The evidence presented suggested a limited degree of research concerning physical therapist's attitudes and beliefs toward pain concepts. The next chapter will present the methods incorporated to complete this thesis.

CHAPTER III

METHODOLOGY

Instrument

The investigator created a self-report survey (Appendix A) for the purpose of data collection. This appeared online and was maintained through www.surveymonkey.com. The survey consisted of 36 questions including 13 attitude questions, 12 belief questions and 11 background questions.

The attitude questions utilized a four-point Likert scale to score the participant's response toward similar questions or information appearing in previous research articles concerning health professionals' pain knowledge and attitudes. Options were based off of previous studies and included: a. Strongly Agree b. Agree c. Disagree d. Strongly Disagree

The belief questions employed a five-point Likert scale to score the participant's response toward perceived behaviors therapists demonstrate when evaluating and treating patients with pain. Options came from past research and included: a. Always b. Most of the time c. Sometimes d. Rarely e. Never

Finally, the background questions included six demographic questions and five educational information questions. The types of responses were taken from previous research examples. The background questions utilized categorical scales ranging from two to eight responses.

Data Collection Procedures

Texas State Institutional Review Board exemption status was granted under Category 2 of 45 CFR, Part 46, Sec. 101(b). To establish content clarity, the preliminary survey (Appendix A) was submitted to two individuals with extensive experience in pain management and orthopaedic physical therapy. A statistician was then consulted to refine the questions and address the survey's overall structure.

Following completion of the above, the survey was recreated on www.surveymonkey.com. A convenience sample (n=1,675) was compiled from the Orthopaedic Section of the American Physical Therapy Association (APTA) and through contacts associated with the Texas State University-San Marcos Department of Physical Therapy.

Participants were notified via email with the appropriate link to the questionnaire (Appendix B). Informed consent was obtained and documented with agreement to complete the online survey. Following its completion, respondents were offered the opportunity to email or call with any comments regarding the study. Data collection began in September 2006 and continued until October

2006. Data analysis started in October 2006 and was completed in February 2007.

Data Analysis

Descriptive statistics were utilized to analyze the data collected through www.surveymonkey.com (Appendix C). This was downloaded as a Microsoft Excel spreadsheet and exported to the Statistical Package for the Social Sciences (SPSS 11.0.4) software application for the Mac OS X. The email list and the data were stored and maintained through the survey website. Retrieval and analysis were accomplished using the researcher's private computer. Counts and percentages were determined for each pain attitude and belief question. Frequencies were tabulated from background information questions to describe the sample. Cross-tabulations utilizing the Pearson chi-square test for independence were employed to describe the significance between questionnaire responses and background information collected. The confidence level was set at alpha $\leq$ 0.05. A statistician reviewed the data to ensure completeness and accuracy. The email list was removed from the website and the investigator's private computer following completion of this study in October 2006.

Analysis revealed that relationships between variables could not be accurately determined due to the high occurrence of missing cells in many survey items. In order to draw comparisons, the responses to the attitude and belief questions were collapsed into two categories. For the attitude questions,

"strongly agree and agree" were combined into the new category "agree" and "disagree and strongly disagree" were combined into the new category "disagree." For the belief questions, "always and very often" were combined into the new category "frequently" whereas "occasionally, seldom and never" were combined into the new category "infrequently." The responses to the background questions were changed such that the categories regarding the educational level would be, "Below Masters level, Masters level and Above Masters level" and the categories regarding experience level would be "0-5 years, 5-10 years, and > 10 years."

Chapter Summary

This chapter detailed the procedures in collecting the survey data and analyzing the results. The next chapter will describe the general results obtained for each survey item and presents more detailed outcomes for selected research questions.

CHAPTER IV

RESULTS

The Orthopaedic Section of the APTA had 12,664 members listed on its online directory when this study began in August 2006. One thousand-six hundred-seventy five physical therapists (13.2%) were emailed to participate in the survey. One hundred-eighty three emails were not delivered (10.9%), 893 (53.3%) did not respond, 158 (9.4%) declined and 441 (26.3%) participated. Twelve (2.7%) of the 441 surveys returned were incomplete and removed from analysis. Useable surveys numbered 428 (25.6%).

Sample Characteristics

Of the 428 respondents, 46.5% (n=199) were male and 53.5% (n=229) were female. Most participants were at or below the Masters level of education and had more than ten years of orthopaedic experience (Table 1).

Table 1. Frequencies, according to gender, for education (question 27), PT experience (question 28) and outpatient orthopaedic experience (question 29)

Male

	Below Masters level				Masters level				Above Masters level			
	PT Experience		Orthopaedic Experience		PT Experience		Orthopaedic Experience		PT Experience		Orthopaedic Experience	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
0-5 years	2	1.5%	3	2.2%	21	12.1%	25	14.5%	17	14.3%	17	14.3%
5-10 years	8	5.9%	10	7.4%	36	20.8%	33	19.1%	14	11.8%	16	13.4%
>10 years	52	38.2%	49	36.0%	25	14.5%	24	13.9%	24	20.2%	22	18.5%
Total	62	45.6%	62	45.6%	82	47.4%	82	47.4%	55	46.2%	55	46.2%

Female

	Below Masters level				Masters level				Above Masters level			
	PT Experience		Orthopaedic Experience		PT Experience		Orthopaedic Experience		PT Experience		Orthopaedic Experience	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
0-5 years	1	.7%	5	3.7%	27	15.6%	28	16.2%	32	26.9%	33	27.7%
5-10 years	6	4.4%	5	3.7%	21	12.1%	27	15.6%	11	9.2%	13	10.9%
>10 years	67	49.3%	64	47.1%	43	24.9%	36	20.8%	21	17.6%	18	15.1%
Total	74	54.4%	74	54.4%	91	52.6%	91	52.6%	64	53.8%	64	53.8%

Prior to this survey, approximately half of the participants had not completed CEUs for pain education while the majority of therapists indicated that they had never worked in a pain clinic, were not current members of a pain organization, and were unfamiliar with the IASP curriculum for Physical Therapists and Occupational Therapists (Table 2).

Table 2. Frequencies, according to gender, for pain clinic experience (question 32), pain continuing education (question 33), pain organization membership (question 34) and familiarity with the IASP curriculum (question 35)

Male

	Yes		No		Total	
	Count	%	Count	%	Count	%
Pain Clinic Experience	32	7.5%	166	39.2%	198	46.7%
Pain Education CEUs	97	22.8%	101	23.8%	198	46.6%
Member of a Pain Organization	57	13.5%	139	32.9%	196	46.3%
Familiar with the IASP Curriculum	18	4.2%	179	42.1%	197	46.4%

Female

	Yes		No		Total	
	Count	%	Count	%	Count	%
Pain Clinic Experience	31	7.3%	195	46.0%	226	53.3%
Pain Education CEUs	115	27.1%	112	26.4%	227	53.4%
Member of a Pain Organization	49	11.6%	178	42.1%	227	53.7%
Familiar with the IASP Curriculum	17	4.0%	211	49.6%	228	53.6%

Survey Statistics

Counts and percentages were determined for the remaining 28 survey items. This consisted of attitudes (Fig. 1), beliefs (Fig. 2) and three background questions (Fig. 3-5). The background items covered the respondents' perceived preparedness as entry-level therapists (question 30), their satisfaction with their current level of pain knowledge (question 31) and their feelings toward treating chronic pain patients (question 36). The results for the attitudes, beliefs and background questions are presented below.

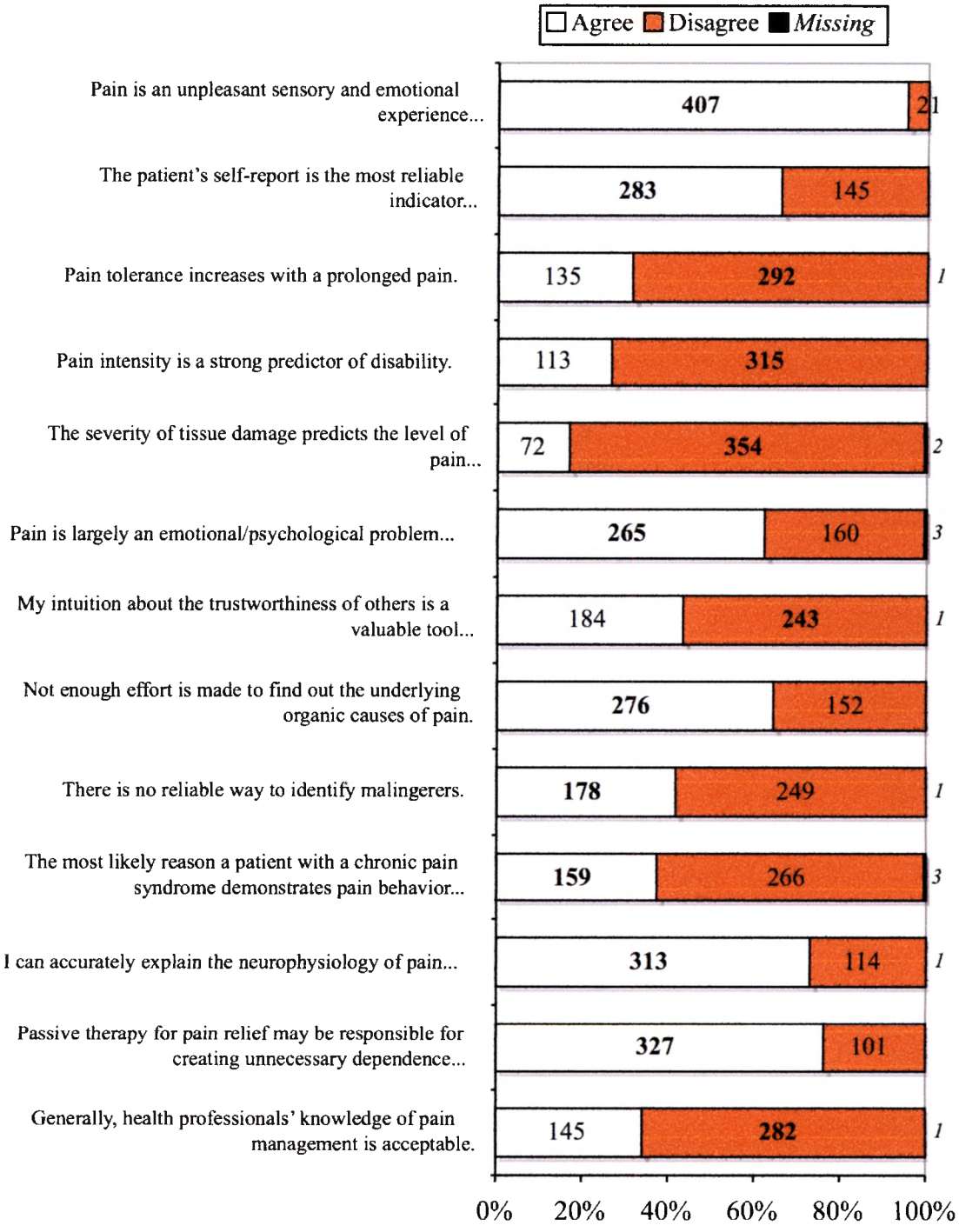


Figure 1. Frequencies for the 13 attitude questions (favorable responses in bold)

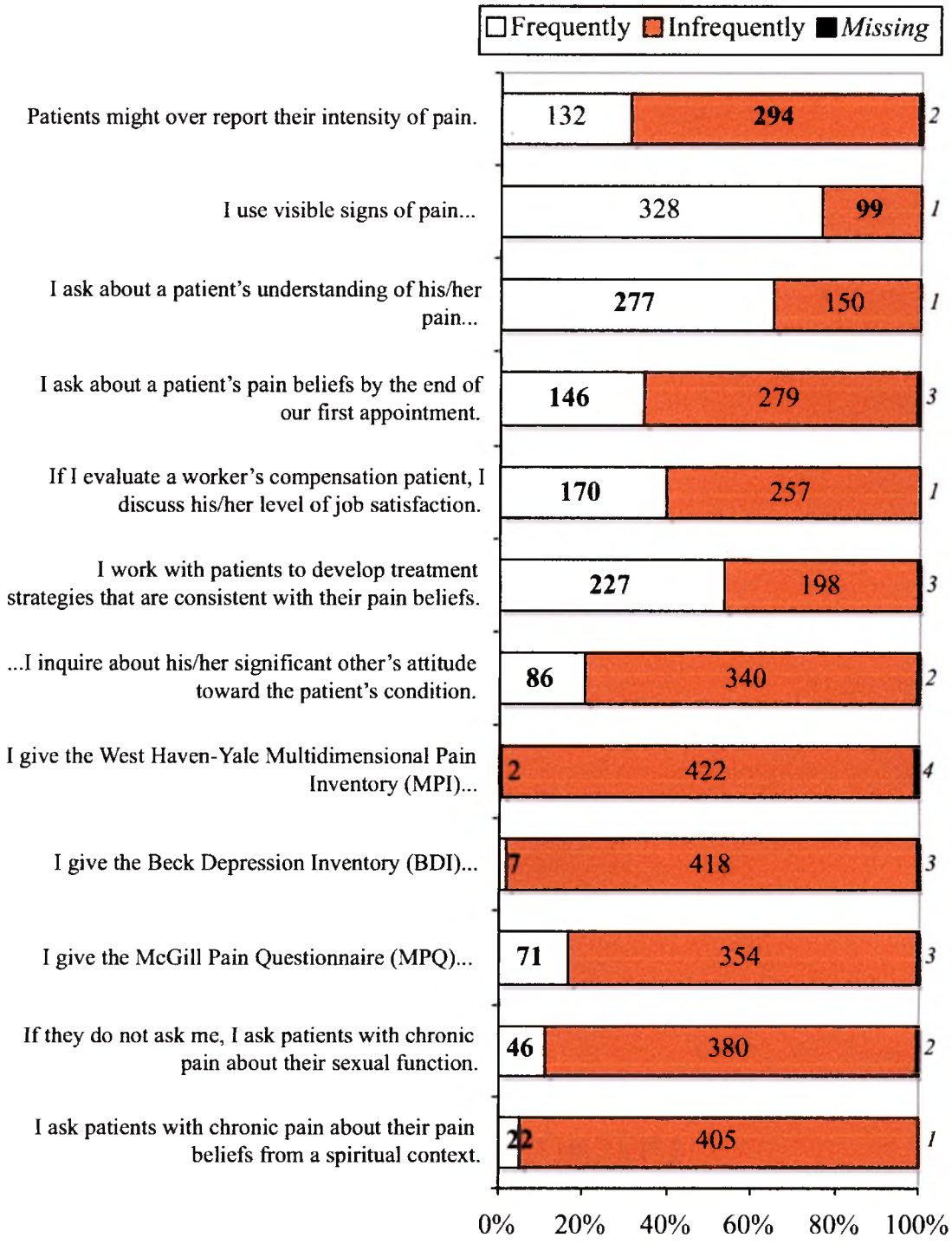


Figure 2. Frequencies for the 12 belief questions (favorable responses in bold)

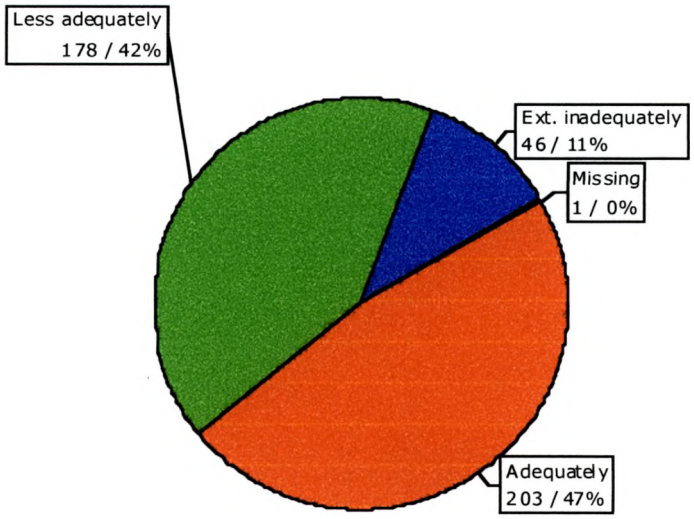


Figure 3. Question 30: How well did the pain theory and management information you received during your entry-level training prepare you for treating the orthopaedic outpatient population?

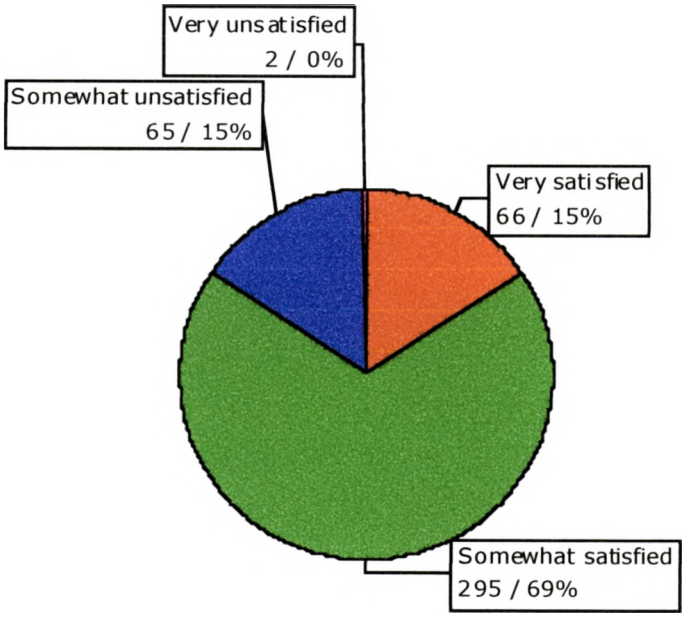


Figure 4. Question 31: How satisfied are you with your current level of knowledge in regard to pain theory and management?

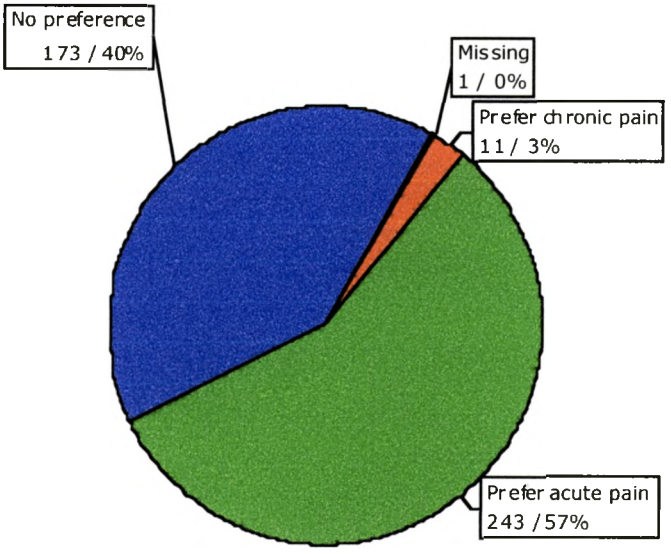


Figure 5. Question 36: How do you feel about working with patients with chronic pain versus patients with acute/subacute pain?

Tests for Independence

Background information, i.e. education, PT experience and orthopaedic experience were cross-tabulated with the 13 attitude questions, 12 belief questions and the three background questions appearing above. Utilizing the chi-square test for independence, p-values were obtained and appear in Table 3.

Table 3. P-values (significant values in bold)

Question	Education	PT Experience	Orthopaedic Experience
1	.916	.221	.194
2	.528	.485	.315
3	.076	**.003**	**.000**
4	.380	.473	.337
5	**.007**	**.021**	.092
6	.299	.112	.151
7	.140	**.025**	.052
8	.135	.737	.943
9	.256	.083	.495
10	.406	**.029**	**.039**
11	.371	.909	.913
12	.316	.655	.459
13	.278	**.003**	**.008**
14	.382	**.002**	**.002**
15	**.017**	**.000**	**.000**
16	.198	.506	.182
17	.235	.747	.275
18	.421	**.043**	**.019**
19	.987	.152	.149
20	**.010**	**.000**	**.000**
21	.594	.425	.359
22	.361	.651	.509
23	**.008**	**.048**	**.026**
24	.217	**.006**	**.000**
25	.372	.831	.797
30	**.014**	**.000**	**.000**
31	.267	.326	.343
36	.167	**.003**	**.000**

Table 4 identifies the p-values for each question when gender is factored into the analysis. As above, significant values are listed in bold type.

Table 4. P-values according to gender (significant values in bold)

Question	Education		PT Experience		Orthopaedic Experience	
	Male	Female	Male	Female	Male	Female
1	.406	.301	.254	.118	.281	.061
2	.638	.293	.330	.410	.160	.129
3	.248	.291	.117	**.010**	.061	**.004**
4	.161	.992	.125	.227	.219	.291
5	.063	.116	.302	.091	.347	.346
6	.361	.265	.056	.831	.075	.892
7	.148	.556	.243	.097	.419	.107
8	.148	.626	.965	.641	.958	.920
9	.793	.225	**.023**	.528	.068	**.024**
10	.234	.497	.123	.612	.063	.781
11	.887	.229	.790	.999	.890	.989
12	.625	.474	.832	.392	.428	.072
13	.453	.573	**.022**	.094	**.042**	.157
14	.199	.988	**.017**	.100	**.007**	.129
15	**.003**	.638	**.000**	.126	**.000**	**.033**
16	.531	.362	.945	.443	.684	.199
17	.261	.052	.654	.801	.628	.131
18	.351	.839	.148	.126	**.030**	.118
19	.919	.863	.148	.735	.209	.381
20	.327	**.011**	**.048**	**.009**	**.004**	**.013**
21	.262	.462	.611	.685	.573	.621
22	.223	.740	.674	.641	.625	.536
23	.134	**.003**	.231	**.045**	.235	.066
24	.972	.120	**.034**	.126	**.006**	**.017**
25	.832	.307	.877	.557	.993	.321
30	.300	**.002**	**.000**	**.000**	**.000**	**.000**
31	.708	.174	.312	.579	.425	.161
36	.573	.455	**.005**	.233	**.002**	.063

Of the 28 questions analyzed, 14 demonstrated appropriate confidence levels ($p \leq 0.05$) to be included in the subsequent analysis. This included questions 3, 5, 7, 9, 10, 13, 14, 15, 18, 20, 23, 24, 30 and 36. Of these, six were attitude questions, six were belief questions and two were background questions.

Measures of Association

Kendall's tau-c was used to calculate the strength of association between 13 of the 14 questions appearing above. Cramer's V was employed for question 36 only. Tables 5 and 6 list these values. Moderate to strong degrees of association appear in bold type.

Table 5. Kendall's tau-c (moderate to strong associations in bold)

Question	Education	PT Experience	Orthopaedic Experience
3	---	.056	.087
5	-.030	.087	---
7	---	.042	---
10	---	.040	-.018
13	---	**.160**	**.150**
14	---	**.149**	**.152**
15	-.035	**.186**	**.207**
18	---	**-.120**	**-.132**
20	.096	**-.160**	**-.169**
23	.024	-.069	-.063
24	---	-.089	**-.110**
30	**-.115**	**.284**	**.293**
36	---	**.136***	**.156***

*** Cramer's V**

Table 6. Kendall's tau-c according to gender (moderate to strong associations in bold)

Question	Education		PT Experience		Orthopaedic Experience	
	Male	Female	Male	Female	Male	Female
3	---	---	---	**.111**	---	**.127**
9	---	---	.076	---	---	.087
13	---	---	**.193**	---	**.183**	---
14	---	---	**.205**	---	**.229**	---
15	-.022	---	**.279**	---	**.281**	**.148**
18	---	---	---	---	**-.190**	---
20	---	**.159**	**-.139**	**-.173**	**-.191**	**-.152**
23	---	**.108**	---	**-.117**	---	---
24	---	---	-.084	---	**-.121**	**-.100**
30	---	**-.220**	**.203**	**.342**	**.225**	**.343**
36	---	---	**.194***	---	**.207***	---

*** Cramer's V**

Chapter Summary

This chapter has presented the statistical analysis and results for each question found in the online survey. Tests for independence and measures of association were performed on 28 questions. Fourteen of these questions indicate appropriate levels of significance and generally mild to moderate degrees of association. The following chapter will discuss the specific results for questions 3, 5, 7, 9, 10, 13, 14, 15, 18, 20, 23, 24, 30 and 36 and attempt to answer the four hypotheses explained earlier. Recommendations for future research, limitations of the study and concluding remarks will be included.

CHAPTER V

DISCUSSION

Hypothesis 1

There will be a statistically significant relationship between the physical therapists' background information and the degree of favorable/unfavorable responses to the attitudes portion of the survey. As a result, as education and clinical experience improves, the tendency to respond favorably to the survey questions increases.

To test this hypothesis, the respondent's educational level, the PT years of experience and the outpatient orthopaedic years of experience were compared to each of the 13 attitude questions using a chi-square test for independence. The confidence level was set at alpha ≤ 0.05. Seven of the questions contained in the attitude section of the survey did not meet the above criteria and therefore the null hypothesis cannot be rejected. However, questions 3, 5, 7, 9, 10 and 13 indicated appropriate levels of significance to the educational level, the PT years of experience and/or the outpatient orthopaedic years of experience of the respondent. Generally, there were mild associations (tau-c = .056 and .087) between

greater PT and orthopaedic experience and the likelihood of responding favorably (disagree) to the statement that pain tolerance increases with a prolonged pain (question 3). However, females with the same experience displayed more moderate associations with this attitude (tau-c = .111 and .127). Overall, 68.4% (n=292) agreed with this attitude and is similar to findings of Rochman[39] where of the 201 respondents to that study, only 57.0% answered this item correctly.[39]

In general, PT experience was mildly associated (tau-c = .087) with responding favorably (disagree) to the item that the severity of tissue damage predicts the level of pain one experiences (question 5). However, greater levels of education demonstrated a weak association with responding unfavorably (agree) with this attitude (tau-c = -.030). Analysis indicated 83.1% (n=354) correctly disagreed with this question. This result is similar to the study by Wolff[9] where, of the 119 responses, 73.1% of the respondents tending to disagree completely or somewhat.[9]

For the most part, there was a mild association between higher PT years of experience (tau-c = .042) and the likelihood of responding favorably (disagree) to the statement that one's intuition about the trustworthiness of others is a valuable tool (question 7). Of the total responses 56.9% (n=243) correctly disagreed with this statement. This outcome is similar to the Rochman[39] study where 49% of the sample answered correctly.

From the analysis, men with more PT experience and women with more orthopaedic experience were mildly associated (tau-c = .076 and .087) with responding unfavorably (disagree) to the idea that there is no reliable way to identify malingerers (question 9). This result is surprising because malingering is considered an invalid concept and self-reports of pain are the most reliable.[37,39]

For the statement that patients with chronic pain demonstrate pain behaviors because of past reinforcement (question 10), a mild association existed between responding unfavorably (disagree) and greater PT experience (tau-c = .040). Further, a mild association was shown between greater orthopaedic experience and responding favorably (agree) to this statement (tau-c = -.018). Why this discrepancy occurred is not fully understood. This could be indicative of improper wording that lead to a misinterpretation of the question though.

Finally, there were moderate associations (tau-c = .160 and .150) between higher PT and orthopaedic experience and the likelihood of responding favorably (disagree) to the concept that health professionals' pain knowledge is acceptable (question 13). Specifically, men with greater PT and orthopaedic experience demonstrated higher association levels (tau-c = .193 and .183). Overall, 66% (n=282) responded favorably to this item. This represents a common finding in the literature that, in general, health professionals' pain management knowledge and/or attitudes are inadequate.[19-31]

To summarize, a total of 15 relationships were discussed above. All but one of the six survey items indicated a favorable response thus validating the original hypothesis. The data suggested that men with more PT years of experience and women with more orthopaedic years of experience were more likely to think that there was a reliable way to identify malingerers. Research has already indicated that 'the most reliable indicator of pain is self-report'.[37] Consequently, therapists should be encouraged to accept a patient's pain report and discouraged from using the concept of malingering in practice.

Hypothesis 2

There will be a statistically significant relationship between the physical therapists' background information and the degree of favorable/unfavorable responses to the beliefs portion of the survey. Hence, as education and clinical experience improves, the tendency to respond favorably to the survey questions increases.

To examine this hypothesis, the participant's educational level, the PT years of experience and the outpatient orthopaedic years of experience were measured against each of the 12 belief questions using a chi-square test for independence. The confidence level was set at alpha ≤ 0.05. Many of the questions contained in the belief section of the survey did not meet the above criteria and thus the null hypothesis is not rejected. However, questions 14, 15, 18, 20, 23 and 24 indicated appropriate levels of significance to the educational level, the

PT years of experience and/or the outpatient orthopaedic years of experience of the respondent. The items are presented below.

Overall, there were mild associations (tau-c = .149 and .152) between greater PT and orthopaedic experience and the likelihood of responding favorably (infrequently) to the belief that patients over report their pain (question 14). Specifically, men displayed a moderate association to this belief (tau-c = .205 and .229) while level of education was not significant in either population. Consequently, if one believes that 'self-report is the most reliable measure of pain intensity',[37] then one can assume over reporting pain as a false concept. Thus, the less experienced therapists may be unaware of this invalid belief.

In general, there were moderate associations (tau-c = .186 and .207) between higher PT and orthopaedic experience and responding favorably (infrequently) to the belief that one can verify another's pain by using visible signs (question 15). As such, the tendency was for less experienced therapists to respond frequently to this erroneous belief. As discussed in the previous question the concept of using anything besides self-report should be discouraged. In addition, the level of education was mildly associated (tau-c = -.035) which indicates that with higher levels of education the tendency was to make the same erroneous reply. This suggests that higher education may not have a curtailing effect on this limiting belief. Lastly, men at higher levels of PT and orthopaedic experience had stronger associations to responding favorably to this belief (tau-c =.279 and

.281) when compared to women with similar orthopaedic experience (tau-c = .148). Why this occurred in the data analysis remains unclear.

For the most part, therapists with greater levels of PT and orthopaedic experience had mild associations (tau-c = -.120 and -.132) with responding favorably (frequently) to the belief that they asked worker's compensation patients their level of job satisfaction (question 18). On the other hand, education was not shown to be significant factor. In all, less experienced therapists demonstrated a greater tendency not to respond favorably to this belief. This may be a limiting belief because according to Feuerstein and Beattie[45] 'the presence of perceived workplace problems can impede rehabilitation efforts directed at functional restoration and return to work'.[45]

From the analysis, there were moderate associations between higher levels of PT and orthopaedic experience (tau-c = -.160 and -.169) and responding favorably (frequently) to the belief that one should inquire about a significant other's attitude towards a patient in pain (question 20). In contrast, higher levels of education demonstrated a mild association (tau-c = .096) with answering unfavorably (infrequently) to this belief. The overall trend of the survey indicated that most (n=340) of the participants did not exercise this belief. While according to the Wolff[9] study, of the 119 responses received, 49.2% of the therapists felt that inclusion of a "significant other" was a necessary component of the physical therapy program.[9] However, this does not seem to be demonstrated in this study. Furthermore, chronic pain has been shown to affect a patient's family, friends

and social network[48,49] and thus has possible implications for a patient's recovery. Therefore, this belief may need to be addressed in less experienced therapists.

There were mild associations between higher education (tau-c = .024) and greater levels of clinical experience (tau-c = -.069 and -.063) using the MPQ in practice (question 23). As such, less educated individuals but more experienced therapists tended to respond favorably (frequently) to this item. However, with education and PT experience equal, female therapists had moderate associations to this belief (tau-c = .108 and -.117). Why females with higher education tended not to utilize the MPQ whereas more experienced female therapists did is unknown.

Finally, there were mild associations between higher PT and orthopaedic experience (tau-c = -.089 and -.110) and responding favorably (frequently) to asking chronic pain patients about their sexual function (question 24). However, a more moderate association was found for men compared to women with equal orthopaedic experience (tau-c = -.121 and -.100). Why this occurred is not clear. Overall, the tendency of this sample was for the more educated and less experienced therapists not to ask about sexual function when dealing with chronic pain patients. This result is surprising considering that 'there is a high prevalence of sexual difficulties in patients with chronic pain'[53] and that sexual function is considered an important domain of one's quality of life.[50] As a result, it is vulnerable to disruption through illness and injury, including chronic pain.[51,52] This belief may be undesirable for outpatient orthopaedic physical therapists who treat patients

with chronic pain.

In summary, 15 relationships were presented above. Most of the relationships indicated that therapists with greater levels of clinical experience tended to respond favorably to the six belief questions presented. Nevertheless, higher educational levels were mildly associated with unfavorable beliefs such as judging visible signs of pain, not asking about the attitude of the patient's spouse, not using the MPQ and not inquiring about chronic pain patient's sexual function. This result is intriguing when one considers whether or not higher levels of education influence beliefs and/or clinical decision-making. That subject is beyond the scope of this thesis and deserves further analysis. In conclusion, the hypothesis that as education improves so does the tendency to reply favorably to belief questions is false. But as demonstrated, when clinical experience improves so does the selection of favorable responses appears to have justification.

Hypothesis 3

There will be a statistically significant relationship between the physical therapists' background information and preparedness in treating patients with pain. So, despite differences in education or clinical experience, the survey would demonstrate a tendency for most orthopaedic physical therapists to feel unprepared in dealing with clinical pain conditions as entry-level therapists.

To investigate this hypothesis, the therapist's educational level, the PT years of experience and the outpatient orthopaedic years of experience were

cross-tabulated against question 30 using a chi-square test for independence. The confidence level was set at alpha ≤ 0.05. Kendall's tau-c was used to measure any association.

Of the 428 participants, 47.4% (n=203) felt adequately prepared as entry-level therapists, 41.6% (n=178) felt less than adequately prepared and 10.7% (n=46) felt extremely inadequate. One response is unaccounted for.

Overall, there was a moderate association to higher levels of education and feeling less than adequately prepared (tau-c = -.115). There was a more moderate association (tau-c = -.220) with the female participants which could indicate that women were more likely to feel less than adequately prepared than men with the same education.

In general, greater PT and orthopaedic experience were more moderately associated with feeling adequately or less than adequately prepared (tau-c = .284 and .293). Men demonstrated moderate levels of association (tau-c = .203 and .225) whereas with the same degree of clinical experience, women had stronger levels of association (tau-c = .342 and .343).

To summarize, when compared to the Wolff[9] study, of the 119 responses discussed, 72.0% felt that their entry-level education in pain management and theory was very inadequate or less than adequate in dealing with an orthopaedic patient population.[9] For this thesis, slightly more than half (52.3%) of the participants felt less than adequately or extremely inadequately prepared as entry-level

physical therapists in dealing with most clinical pain conditions. In addition, with all else equal, females did demonstrate a stronger association to responding that they did not feel adequately prepared. Accordingly, the hypothesis that most orthopaedic physical therapists would tend to feel unprepared in dealing with clinical pain conditions as entry-level therapists is justified.

Hypothesis 4

There will be a statistically significant relationship between the physical therapists' background information and preference in treating patients with pain. On that account, despite differences in education or clinical experience, the survey would demonstrate a tendency for most orthopaedic physical therapists to prefer working with patients with acute/subacute pain versus chronic pain.

To analyze this hypothesis, the respondent's educational level, the PT years of experience and the outpatient orthopaedic years of experience were compared to question 36 using a chi-square test for independence. The confidence level was set at alpha ≤ 0.05. Cramer's V was employed to measure any association.

Of the 428 participants, 56.8% (n=243) preferred to treat patients with acute/subacute pain, 40.4% (n=173) had no preference and 2.6% (n=11) preferred to treat patients with chronic pain. One response is unaccounted for.

Generally, the relationship between education and preference was not statistically significant (p = .167). Overall, PT experience and orthopaedic experience were moderately associated with preference (V = .136 and .156) but the direction of that relationship cannot be determined due to limitations inherent in the Cramer's V test. With PT and othopaedic experience being equal, men had a statistically significant (p = .005 and .002) and moderate association with preference (V = .192 and .207).

The outcomes presented above are inconsistent with the findings of Wolff.[9] In that study, of the 119 responses, approximately 96.0% (n=114) of the respondents preferred to work with patients who were not likely to have chronic pain.[9] The measures of association between education, experience and this preference were not published in her study and represents a limitation for drawing any further comparison.

In summary, more than half (56.8%) of the participants indicated that they preferred treating patients with acute/subacute pain. Level of education was not statistically related to this preference. However, in men, PT and orthopaedic experiences were significant and demonstrated moderate strengths of association. But, in conclusion, the hypothesis that most orthopaedic physical therapists would tend to prefer working with patients with acute/subacute pain is not substantiated.

Recommendations

Pain attitudes and beliefs are largely unknown for this sample of outpatient orthopaedic physical therapists. For the most part, the outcomes for the attitudes portion of the survey are encouraging and consistent with the improvements being made in the understanding of pain and its management. However, the beliefs portion of the survey indicates a greater likelihood for physical therapists to select unfavorable responses. Consequently, more research is required to understand how gender, knowledge, attitudes and beliefs shape behavior and clinical decision-making. Further study is also needed to determine the pain attitudes and beliefs that other types of physical therapists hold and how they may influence their practice.

Limitations

Several limitations exist for this descriptive study. First, the sample used was that of convenience and the survey was distributed with the intention of achieving an equal number of male and female participants. Second, therapists from certain states, i.e. New York, California, Texas were more heavily represented in this research and what effect, if any, this has on the outcome remains unknown. Third, the survey remained online for one month only. As such, this may have limited the number of possible respondents. Fourth, the response items listed in the survey were intentionally limited. This may have discouraged participation or reduced accurate response selection. Fifth, some survey ques-

tions were later identified by participants as ambiguous or poorly worded. This may have also lead to choosing an inappropriate response. Sixth, the attitudes and beliefs appearing in the survey represent hypothetical ideals based on previous research. It may be invalid to assume these are appropriate to all clinical practices or universal to all physical therapists. Lastly, it was assumed that the survey would be completed honestly by the therapist. Because of the above, interpretation of the data presented in this thesis is limited and cautionary.

Conclusion

The goal of this study was to identify any potentially limiting attitudes and beliefs outpatient orthopaedic therapists may hold when evaluating and treating patients with nonmalignant pain. Fourteen of the 28 survey questions were identified as being statistically associated with a respondent's education and/or clinical experience. In general, this study indicated that the participants held favorable attitudes, but demonstrated unfavorable beliefs concerning pain theory and its management. Differences of associated responses were identified between men and women. Overall, more than half of the therapists indicated that they did not feel prepared for treating pain conditions as entry-level therapists, and they preferred treating patients with acute/subacute pain.

This preliminary research indicates initiating further discussion on what role gender has in influencing survey responses. This study also demonstrates a

greater need for understanding pain attitudes and beliefs, and how they influence clinical decision-making within the field of physical therapy.

APPENDIX A

Part A: Attitudes

1. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

2. The patient's self-report is the most reliable indicator for the intensity of pain.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

3. Pain tolerance increases with a prolonged pain.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

4. Pain intensity is a strong predictor of disability.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

5. The severity of tissue damage predicts the level of pain one experiences.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

6. Pain is largely an emotional/psychological problem, especially in the patient who is highly anxious, depressed or without a clear physical cause for pain.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

7. My intuition about the trustworthiness of others is a valuable tool in identifying whether or not a person is lying about the intensity of his/her pain.

a. Strongly Agree
b. Agree
c. Disagree
d. Strongly Disagree

8. Not enough effort is made to find out the underlying organic causes of pain.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

9. There is no reliable way to identify malingerers.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

10. The most likely reason a patient with a chronic pain syndrome demonstrates pain behavior, e.g. limping, moaning, wincing to the PT is because the patient received positive reinforcement for such behavior in the past.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

11. I can accurately explain the neurophysiology of pain, i.e. the basic structure of the nervous system and the components of the nociception/pain pathways.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

12. Passive therapy for pain relief may be responsible for creating unnecessary dependence on therapists or treatment.
    a. Strongly Agree
    b. Agree
    c. Disagree
    d. Strongly Disagree

13. Generally, health professionals' knowledge of pain management is acceptable.
    a. Strongly Agree

b. Agree
c. Disagree
d. Strongly Disagree

Part B: Beliefs

14. Patients might over report their intensity of pain.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

15. I use visible signs of pain, i.e. facial grimacing, muscle guarding, etc. to help me verify a patient's reported level of pain.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

16. I ask about a patient's understanding of his/her pain before I address the symptoms.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

17. I ask about a patient's pain beliefs by the end of our first appointment.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

18. If I evaluate a worker's compensation patient who reports pain, I discuss his/her level of job satisfaction.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

19. I work with patients to develop treatment strategies that are consistent with their pain beliefs.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

20. When evaluating a patient in pain, I inquire about his/her significant other's attitude toward the patient's condition.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

21. I give the West Haven-Yale Multidimensional Pain Inventory (MPI) to patients with chronic pain.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

22. I give the Beck Depression Inventory (BDI) to patients with chronic pain.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

23. I give the McGill Pain Questionnaire (MPQ) to patients with chronic pain.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

24. If they do not ask me, I ask patients with chronic pain about their sexual function.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom

e. Never

25. I ask patients with chronic pain about their pain beliefs from a spiritual context.
    a. Always
    b. Very often
    c. Occasionally
    d. Seldom
    e. Never

Part C: Background Information

26. I am...
    a. Male
    b. Female

27. What is the highest educational level/degree in physical therapy that you hold?
    a. BSPT
    b. MSPT
    c. MPT
    d. DPT
    e. T-DPT
    f. D.Sc.
    g. PhD
    h. Certificate

28. How long have you been a physical therapist?
    a. 0-2 years
    b. 2-5 years
    c. 5-10 years
    d. 10-15 years
    e. 15+ years

29. How much outpatient orthopedic experience do you have?
    a. 0-2 years
    b. 2-5 years
    c. 5-10 years
    d. 10-15 years
    e. 15+ years

30. How well did the pain theory and management information you received during your **entry-level** training prepare you for treating the orthopedic outpatient population?
    a. Adequately in dealing with most clinical pain conditions
    b. Less than adequately in dealing with most clinical pain conditions
    c. Extremely inadequately in dealing with most clinical pain conditions

31. How satisfied are you with your current level of knowledge in regards to pain theory and management?
    a. Very satisfied
    b. Somewhat satisfied
    c. Somewhat unsatisfied
    d. Very unsatisfied

32. Have you ever been employed as a PT in a multidisciplinary pain clinic?
    a. Yes
    b. No

33. Have you attended any continuing education courses regarding pain theory or pain management since becoming a PT?
    a. Yes
    b. No

34. Do you belong to any national organization that promotes pain research and education?
    a. Yes
    b. No

35. Are you aware of the International Association for the Study of Pain (IASP) Curriculum for Physical Therapists and Occupational Therapists?
    a. Yes
    b. No

36. How do you feel about working with patients with chronic pain versus patients with acute/subacute pain?
    a. I prefer to treat patients with chronic pain versus acute/subacute pain.
    b. I prefer to treat patients with acute/subacute pain versus chronic pain.
    c. I have no preference.

I welcome your comments. Thank you for your assistance.

APPENDIX B

PT student requests your help

Dear [FirstName],

My name is Russell. I'm a PT student at Texas State University and an Orthopaedic Section member of the APTA. I'm conducting an online survey to meet my thesis requirement for completion of my Master of Science degree in Physical Therapy.

If you can answer YES to ALL of the questions below, please consider participating in my survey.

1. Are you a member of the Orthopaedic Section of the APTA?

2. Do you evaluate and treat patients in at least one orthopaedic outpatient setting?

3. Do you work with patients who have acute/subacute pain (0-12 weeks of duration)?

4. Do you work with patients who have chronic pain (3+ months of duration)?

Here is a link to the survey:

[SurveyLink]

Please note: If you DO NOT meet the above criteria or if you prefer not to participate, then please click the following link and I will remove you from my survey list:

[RemoveLink]

Thank you,

Russell Northrup, SPT

APPENDIX C

Results Summary

Show All Pages and Questions

Export... View Detail >>

Filter Results
To analyze a subset of your data, you can create one or more filters.

Add Filter...

Total: 441
Visible: 441

Share Results
Your results can be shared with others, without giving access to your account.

Configure...

Status: Enabled
Reports: Summary and Detail

2. Part A: Attitudes

1. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.

	Response Percent	Response Total
a. Strongly Agree	41.1%	181
b. Agree	**53.9%**	**237**
c. Disagree	4.5%	20
d. Strongly Disagree	0.5%	2
Total Respondents		**440**
(skipped this question)		1

2. The patient's self-report is the most reliable indicator for the intensity of pain.

	Response Percent	Response Total
a. Strongly Agree	10.7%	47
b. Agree	**55.1%**	**243**
c. Disagree	32.2%	142
d. Strongly Disagree	2%	9
Total Respondents		**441**
(skipped this question)		0

3. Pain tolerance increases with a prolonged pain.

	Response Percent	Response Total
a. Strongly Agree	2.5%	11
b. Agree	29.2%	128
c. Disagree	**62%**	**272**
d. Strongly Disagree	6.4%	28
Total Respondents		**439**
(skipped this question)		2

4. Pain intensity is a strong predictor of disability.

	Response Percent	Response Total
a. Strongly Agree	5%	22
b. Agree	21.9%	96
c. Disagree	**62.2%**	**273**
d. Strongly Disagree	10.9%	48
Total Respondents		**439**
(skipped this question)		2

5. The severity of tissue damage predicts the level of pain one experiences.

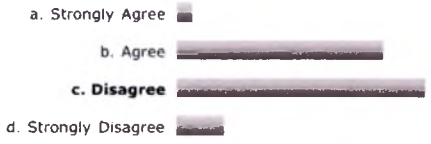
	Response Percent	Response Total
a. Strongly Agree	2.5%	11
b. Agree	15.5%	68
c. Disagree	**62.9%**	**276**
d. Strongly Disagree	19.1%	84
Total Respondents		**439**
(skipped this question)		2

6. Pain is largely an emotional/psychological problem, especially in the patient who is highly anxious, depressed or without a clear physical cause for pain.

	Response Percent	Response Total
a. Strongly Agree	15.8%	69
b. Agree	**47%**	**205**
c. Disagree	33.7%	147
d. Strongly Disagree	3.4%	15

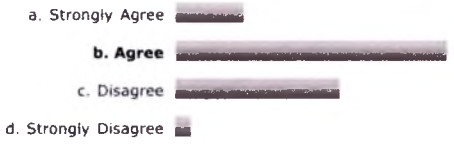
Total Respondents	**436**
(skipped this question)	5

7. My intuition about the trustworthiness of others is a valuable tool in identifying whether or not a person is lying about the intensity of his/her pain.



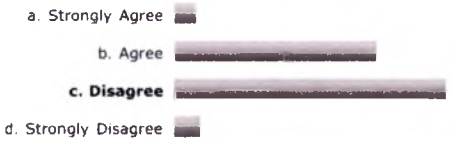
	Response Percent	Response Total
a. Strongly Agree	3.7%	16
b. Agree	39.8%	174
c. Disagree	**47.1%**	**206**
d. Strongly Disagree	9.4%	41
Total Respondents		**437**
(skipped this question)		4

8. Not enough effort is made to find out the underlying organic causes of pain.



	Response Percent	Response Total
a. Strongly Agree	13.7%	60
b. Agree	**51.1%**	**224**
c. Disagree	31.7%	139
d. Strongly Disagree	3.4%	15
Total Respondents		**438**
(skipped this question)		3

9. There is no reliable way to identify malingerers.



	Response Percent	Response Total
a. Strongly Agree	4.1%	18
b. Agree	38.2%	167
c. Disagree	**51.9%**	**227**
d. Strongly Disagree	5.7%	25
Total Respondents		**437**
(skipped this question)		4

10. The most likely reason a patient with a chronic pain syndrome demonstrates pain behavior, e.g. limping, moaning, wincing to the PT is because the patient received positive reinforcement for such behavior in the past.

	Response Percent	Response Total
a. Strongly Agree	2.8%	12
b. Agree	35.5%	154
c. Disagree	**55.8%**	**242**
d. Strongly Disagree	6%	26
Total Respondents		**434**
(skipped this question)		7

11. I can accurately explain the neurophysiology of pain, i.e. the basic structure of the nervous system and the components of the nociception/pain pathways.

	Response Percent	Response Total
a. Strongly Agree	11.9%	52
b. Agree	**61.3%**	**268**
c. Disagree	25.6%	112
d. Strongly Disagree	1.1%	5
Total Respondents		**437**
(skipped this question)		4

12. Passive therapy for pain relief may be responsible for creating unnecessary dependence on therapists or treatment.

	Response Percent	Response Total
a. Strongly Agree	19.2%	84
b. Agree	**57.1%**	**250**
c. Disagree	21.9%	96
d. Strongly Disagree	1.8%	8
Total Respondents		**438**
(skipped this question)		3

13. Generally, health professionals' knowledge of pain management is acceptable.

	Response Percent	Response Total
a. Strongly Agree	0.9%	4
b. Agree	33.2%	145
c. Disagree	**59.5%**	**260**
d. Strongly Disagree	6.4%	28

Total Respondents	**437**
(skipped this question)	4

3. Part B: Beliefs

14. Patients might over report their intensity of pain.

	Response Percent	Response Total
a. Always	0%	0
b. Very often	30.8%	132
c. Occasionally	**66.7%**	**286**
d. Seldom	2.6%	11
e. Never	0%	0
Total Respondents		**429**
(skipped this question)		12

15. I use visible signs of pain, i.e. facial grimacing, muscle guarding, etc. to help me verify a patient's reported level of pain.

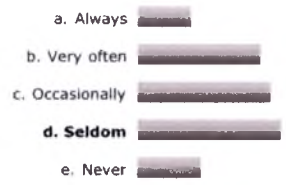
	Response Percent	Response Total
a. Always	22.1%	95
b. Very often	**54.9%**	**236**
c. Occasionally	18.4%	79
d. Seldom	4.2%	18
e. Never	0.5%	2
Total Respondents		**430**
(skipped this question)		11

16. I ask about a patient's understanding of his/her pain before I address the symptoms.

	Response Percent	Response Total
a. Always	19.8%	85
b. Very often	**44.9%**	**193**
c. Occasionally	20.5%	88
d. Seldom	11.6%	50
e. Never	3.3%	14
Total Respondents		**430**

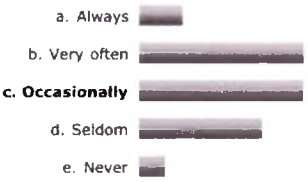
(skipped this question) 11

17. I ask about a patient's pain beliefs by the end of our first appointment.



	Response Percent	Response Total
a. Always	10.7%	46
b. Very often	23.4%	100
c. Occasionally	25.7%	110
d. Seldom	**27.8%**	**119**
e. Never	12.4%	53
Total Respondents		**428**
(skipped this question)		13

18. If I evaluate a worker's compensation patient who reports pain, I discuss his/her level of job satisfaction.

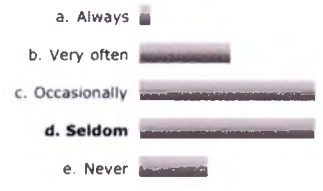


	Response Percent	Response Total
a. Always	8.1%	35
b. Very often	31.6%	136
c. Occasionally	**31.9%**	**137**
d. Seldom	23.3%	100
e. Never	5.1%	22
Total Respondents		**430**
(skipped this question)		11

19. I work with patients to develop treatment strategies that are consistent with their pain beliefs.

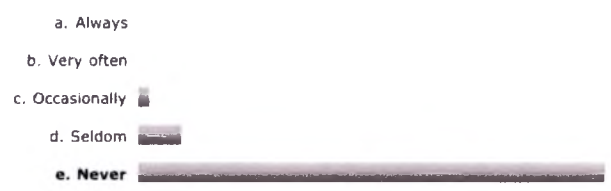
	Response Percent	Response Total
a. Always	10.3%	44
b. Very often	**43%**	**184**
c. Occasionally	31.1%	133
d. Seldom	13.8%	59
e. Never	1.9%	8
Total Respondents		**428**
(skipped this question)		13

20. When evaluating a patient in pain, I inquire about his/her significant other's attitude toward the patient's condition.



	Response Percent	Response Total
a. Always	2.8%	12
b. Very often	17.2%	74
c. Occasionally	33.1%	142
d. Seldom	**33.3%**	**143**
e. Never	13.5%	58
Total Respondents		**429**
(skipped this question)		12

21. I give the West Haven-Yale Multidimensional Pain Inventory (MPI) to patients with chronic pain.



	Response Percent	Response Total
a. Always	0%	0
b. Very often	0.5%	2
c. Occasionally	2.3%	10
d. Seldom	8.9%	38
e. Never	**88.3%**	**377**
Total Respondents		**427**
(skipped this question)		14

22. I give the Beck Depression Inventory (BDI) to patients with chronic pain.

	Response Percent	Response Total
a. Always	0%	0
b. Very often	1.6%	7
c. Occasionally	7.2%	31
d. Seldom	9.8%	42
e. Never	**81.3%**	**348**
Total Respondents		**428**
(skipped this question)		13

23. I give the McGill Pain Questionnaire (MPQ) to patients with chronic pain.

	Response Percent	Response Total

a. Always	4.7%	20
b. Very often	11.9%	51
c. Occasionally	17.5%	75
d. Seldom	13.1%	56
e. Never	**52.8%**	**226**
	Total Respondents	**428**
	(skipped this question)	13

24. If they do not ask me, I ask patients with chronic pain about their sexual function.

	Response Percent	Response Total
a. Always	2.1%	9
b. Very often	8.6%	37
c. Occasionally	24.7%	106
d. Seldom	30.3%	130
e. Never	**34.3%**	**147**
	Total Respondents	**429**
	(skipped this question)	12

25. I ask patients with chronic pain about their pain beliefs from a spiritual context.

	Response Percent	Response Total
a. Always	0.2%	1
b. Very often	4.9%	21
c. Occasionally	15.3%	66
d. Seldom	25.6%	110
e. Never	**54%**	**232**
	Total Respondents	**430**
	(skipped this question)	11

4. Part C: Background Information

26. I am...

	Response Percent	Response Total
a. Male	46.7%	199

b. Female	**53.3%**	**227**
	Total Respondents	**426**
	(skipped this question)	16

27. What is the highest educational level/degree in physical therapy that you hold?

	Response Percent	Response Total
a. BSPT	**29.1%**	**125**
b. MSPT	17.9%	77
c. MPT	22.4%	96
d. DPT	14%	60
e. T-DPT	9.8%	42
f. D.Sc.	1.6%	7
g. PhD	2.6%	11
h. Certificate	2.6%	11
	Total Respondents	**429**
	(skipped this question)	13

28. How long have you been a physical therapist?

	Response Percent	Response Total
a. 0-2 years	8.9%	38
b. 2-5 years	14.5%	62
c. 5-10 years	22%	94
d. 10-15 years	12.4%	53
e. 15+ years	**42.2%**	**180**
	Total Respondents	**427**
	(skipped this question)	15

29. How much orthopaedic outpatient experience do you have?

	Response Percent	Response Total
a. 0-2 years	9.3%	40
b. 2-5 years	16.6%	71
c. 5-10 years	24.2%	104
d. 10-15 years	12.4%	53

e. 15+ years	**37.5%**	**161**
	Total Respondents	**429**
	(skipped this question)	13

30. How well did the pain theory and management information you received during your entry-level training prepare you for treating the orthopaedic outpatient population?

	Response Percent	Response Total
a. Adequately in dealing with most clinical pain conditions	**47.4%**	**203**
b. Less than adequately in dealing with most clinical pain conditions	41.8%	179
c. Extremely inadequately in dealing with most clinical pain conditions	10.7%	46
	Total Respondents	**428**
	(skipped this question)	14

31. How satisfied are you with your current level of knowledge in regards to pain theory and management?

	Response Percent	Response Total
a. Very satisfied	15.3%	66
b. Somewhat satisfied	**69.1%**	**297**
c. Somewhat unsatisfied	15.1%	65
d. Very unsatisfied	0.5%	2
	Total Respondents	**430**
	(skipped this question)	12

32. Have you ever been employed as a PT in a multidisciplinary pain clinic?

	Response Percent	Response Total
a. Yes	14.8%	63
b. No	**85.2%**	**363**
	Total Respondents	**426**
	(skipped this question)	16

33. Have you attended any continuing education courses regarding pain theory or pain management since becoming a PT?

	Response Percent	Response Total
a. Yes	**50.1%**	**214**

b. No	49.9%	213
Total Respondents		**427**
(skipped this question)		15

34. Do you belong to any national organization that promotes pain research and education?

	Response Percent	Response Total
a. Yes	24.9%	106
b. No	**75.1%**	**319**
Total Respondents		**425**
(skipped this question)		17

35. Are you aware of the International Association for the Study of Pain (IASP) Curriculum for Physical Therapists and Occupational Therapists?

	Response Percent	Response Total
a. Yes	8.2%	35
b. No	**91.8%**	**392**
Total Respondents		**427**
(skipped this question)		15

36. How do you feel about working with patients with chronic pain versus patients with acute/subacute pain?

	Response Percent	Response Total
a. I prefer to treat patients with chronic pain versus acute/subacute pain.	2.6%	11
b. I prefer to treat patients with acute/subacute pain versus chronic pain.	**57.1%**	**245**
c. I have no preference.	40.3%	173
Total Respondents		**429**
(skipped this question)		13

REFERENCES

1. Scudds RJ, Scudds RA, Simmonds MJ. Pain in the physical therapy (pt) curriculum: a faculty survey. *Physiotherapy Theory and Practice.* 2001;17:239-56.

2. Houben RMA, Gijsen A, Peterson J, de Jong PJ, Vlaeyen JWS. Do health care providers' attitudes towards back pain predict their treatment recommendations? Differential predictive validity of implicit and explicit attitude measures. *Pain.* 2005;114:491-8.

3. Hartigan C, Rainville J, Sobel JB, Hipona M. Long-term exercise adherence after intensive rehabilitation for chronic low back pain. *Med Sci Sports Exerc.* 2000;32(3):551-57.

4. Bem DJ. *Beliefs, Attitudes, and Human Affairs.* CA: Brooks/Cole. 1970.

5. Daykin AR, Richardson B. Physiotherapists' pain beliefs and their influence on the management of patients with chronic low back pain. *Spine.* 2004;29(7):783-795.

6. Stenmar L, Nordholm LA. Swedish physical therapists' beliefs on what makes therapy work. *Phys Ther.* 1994;74:1034-39.

7. Askew R, Kibelstis C, Overbaugh S, et al. Physical therapists' perception of patients' pain and its effect on management. *Physiother Res Int.* 1998;3:37-57.

8. Gyllensten AL, Gard G, Sulford E, et al. Interaction between patient and physiotherapist: a qualitative study reflecting the physiotherapist's perspective. *Physiother Res Int.* 1999;4:89-109.

9. Wolff MS. Chronic pain: assessment of orthopaedic physical therapists' knowledge and attitudes. *Physical Therapy.* 1991;71:207-14.

10. Battie MC, Cherkin DC, Dunn R, et al. Managing low back pain: attitudes and treatment preferences of physical therapists. *Phys Ther.* 1994;74:219-26.

11. Oppenheim AN. *Questionnaire Design, Interviewing and Attitude Measurements.* 2nd ed. London: Pinter. 1992.

12. Jones M. Clinical reasoning and pain. *Manual Therapy.* 1995;1:17-24.

13. Myers JS. Cancer pain: assessment of nurses' knowledge and attitudes. *ONF.* 1985;12(4):62-66.

14. Fishbein M, Ajzen I. *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research.* Reading, MA: Addison-Wesley. 1975.

15. Merskey H. Classification of chronic pain description of chronic pain syndromes and definition of pain terms. *Pain.* 1979;(suppl 3):S217.

16. van Griensven H. *Pain in Practice: Theory and Treatment Strategies for Manual Therapists.* Elsevier: Edinburgh. 2005.

17. Loeser JD, Fordyce, WE. Chronic pain. In: Carr JE, Dengerik HA, eds. *Behavioural Science in the Practice of Medicine.* Elsevier: Amsterdam. 1983.

18. Aronoff GM. Psychological aspects of nonmalignant chronic pain: a multidisciplinary approach. *Res Staff Physician.* 1984;3:10-13.

19. Yates P, Dewar A, Edwards H, et al. The prevalence and perceptions of pain amongst hospital in-patients. *J Clin Nurs.* 1998;7:521-530.

20. Drayer RA, Henderson J, Reidenberg M. Barriers to better pain control in hospitalized patients. *J Pain Symptom Manage.* 1999;17:434-440.

21. Whelan CT, Jin L, Meltzer D. Pain and satisfaction with pain control in hospitalized medical patients: no such thing as low risk. *Arch Intern Med.* 2004;164:175-180.

22. McHugh G, Thomas G. Living with chronic pain: the patient's perspective. *Nurs Stand.* 2001;15:33-7.

23. Clarke E, French B, Bilodeau M, Capasso V, Edwards A, Empoliti J. Pain management knowledge, attitudes and clinical practice: impact of nurses characteristics and education. *J Pain Symptom Manage.* 1996;11:18-31.

24. Twycross A. Educating nurses about pain management: the way forward. *J Clin Nurs.* 2002;11:705-14.

25. Madjar I. Of pain, nursing and professional leadership: some personal reflections (editorial). *J Nurs Manag.* 2004;12:151-2.

26. Tse M, Chan B. Knowledge and attitudes in pain management: Hong Kong nurses' perspective. *J of Pain & Palliative Care Pharmacotherapy.* 2004;18:47-58.

27. Simpson K, Kautzman L, Dodd S. The effects of a pain management education program on the knowledge level and attitudes of clinical staff. *Pain Management Nursing.* 2002;3:87-93.

28. Strong J, Meredith P, Darnell R, Chong M, Roche P. Does participation in a pain course based on the international association for the study of pain's curricula guidelines change student knowledge about pain? *Pain Res Manage.* 2003;8:137-142.

29. Goodrich, C. Students' and faculty members' knowledge and attitudes regarding pain management: a descriptive survey. *J of Nursing Education.* 2006;45:140-142.

30. Sloman R. Nurses' knowledge of pain in the elderly. *J Pain Symptom Manage.* 2001;21:317-22.

31. Visentin M. Knowledge and attitudes of italian medical staff towards the approach and treatment of patients in pain. *J Pain Symptom Manage.* 2001;22:925-30.

32. Geisser ME, Roth RS. Knowledge of and agreement with chronic pain diagnosis: relation to affective distress, pain beliefs and coping, pain intensity, and disability. *J of Occ Rehab.* 1998;8(1):73-88.

33. Millard RW, Wells N, Thebarge RW. A comparison of models describing reports of disability associated with chronic pain. *Clin J Pain.* 1991;7:283-291.

34. Vlaeyen JWS, Kole-Snidjers AMJ, Rotteveel AM, Rsesink R, Heuts PHTG. The role of fear of movement/(re)injury in pain disability. *J Occup Rehab.* 1995;5:235-252.

35. Price D. *Psychological Mechanisms of Pain and Analgesia (Progress in Pain Research and Managment).* IASP Press. 1999.

36. McCaffery M, Pasero C. *Pain: Clinical Manual.* 2nd ed. St Louis: Mosby. 1999.

37. Acute Pain Management Guideline Panel. Acute pain management operative or medical procedures and trauma. Clinical practice guideline (AHCPR publication no 92-0032). Rockville, MD. Agency for Health Care Policy and Research. United States Department of Health and Human Services. Public Health Service. 1992.

38. McCaffery M, Ferrell B. Nurses' knowledge of pain assessment and management: how much progress have we made?. *J Pain Symptom Manage.* 1997;14(3):175-188.

39. Rochman DL. Students' knowledge of pain: a survey of four schools. *OTI.* 1998;5(2):140-54.

40. Ostleo R, Stomp-van den Berg S, Vlaeyen J, Wolters P, de Vet H. Health care provider's attitude and beliefs towards chronic low back pain: the development of a questionnaire. *Manual Therapy.* 2003;8(4):214-222.

41. Moseley GL, Nicholas MK, Hodges PW. A randomized controlled trial of intensive neurophysiology education in chronic low back pain. *Clin J Pain.* 2004;20(5):324-30.

42. Klaber Moffett J. Back pain: encouraging a self-managment approach. *Physiotherapy Theory and Practice.* 2002;18:205-12.

43. Turk DC, Meichenbaum D. A cognitive-behavioral approach to pain managment. In: Wall PD, Melzack R, editors. Textbook of pain. 3rd ed. 1990. pp. 1337-1348.

44. Cervantes JM, Lechuga DM. The meaning of pain: a key to working with spanish-speaking patients with work-related injuries. *Professional Psychology: Research and Practice.* 2004;35(1):27-35.

45. Feuerstein M, Beattie P. Biobehavioral factors affecting pain and disability in low back pain: mechanisms and assessment. *Phys Ther.* 1995;75(4):267-74.

46. Hankin H, Spencer T, Kegerreis S, Worrell T, Rice J. Analysis of pain behavior profiles and functional disability in outpatient physical therapy clinics. *JOSPT.* 2001;31(2):90-95.

47. Mikail SF, DuBreuil S, D'Eon JL. A comparative analysis of measures used in the assessment of chronic pain patients. *Psychological Assessment.* 1993;5(1):117-120.

48. Crue BL, Pinsky JJ. An approach to chronic pain of non-malignant origin. *Postgrad Med J.* 1984;60:858-864.

49. Jacox AK. Assessing pain. *Am J Nurs.* 1979;79(5):895-900.

50. Fallowfield L. *The Quality of Life.* London: Souvenir Press. 1990.

51. Roy R. A problem-centered family systems approach in treating chronic pain. In:Holzman AD, Turk DC, eds. *Pain Management: A Handbook of Psychological Treatment Approaches.* New York: Pergamon Press. 1986:113-30.

52. Payne B, Norfleet MA. Chronic pain and family: a review. *Pain.* 1986;26:1-22.

53. Ambler N, de C Williams A, Hill P, Gunary R, Cratchley G. Sexual difficulties of chronic pain patients. *Clin J of Pain.* 2001;17:138-145.

54. Jones M, Edward I, Gifford L. Conceptual models for implementing biopsychosocial theory in clinical practice. *Manual Therapy.* 2002;7(1):2-9.

55. Brookfield S. Clinical reasoning and generic thinking skills. In: Higgs J, Jones MA (eds) *Clinical Reasoning in the Health Professions.* 2nd ed. Butterworth-Heinemann: Oxford. 2000.

56. Mezirow J. *Transformative Dimensions of Adult Learning.* Jossey-Bass: San Francisco. 1991.

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