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KNOWLEDGE AND PERCEPTIONS OF ENTRY LEVEL PHYSICAL
THERAPY CLINICAL SKILLS BY TEXAS ORTHOPEDIC
INTERNS, RESIDENTS, AND FACULTY

A THESIS

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TABLE OF CONTENTS

Chapter

I.	INTRODUCTION.	1
	Statement of the Problem.	2
	Purpose of the Study.	2
	Research Questions.	3
	Operational Definitions	3
	Limitations	6
	Assumptions	6
	Significance of Study	7
II.	REVIEW OF LITERATURE.	8
	Role Delineation.	8
	The Mastery and Assessment of Clinical Skills Instrument.	15
III.	METHODOLOGY	17
	Population and Sample	17
	Collection of Data.	18
	Instrument.	19
	Data Analysis	21
IV.	RESULTS	24
	Introduction.	24
	Research Questions.	24
V.	SUMMARY, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS	36
	Summary	36
	Discussion.	37
	Conclusions	39
	Recommendations	40

APPENDIXES

A.	Written Consent of Facilities.	41
B.	Subjects Informed Consent.	46
C.	Questionnaire.	48
D.	Application to Human Subjects Review Committee	50
REFERENCES.	54

CHAPTER I

INTRODUCTION

Orthopedics is a medical subspecialty that is continually changing due to advances in diagnosis, treatment and surgical procedures. Orthopedic physicians maintain a close working relationship with physical therapists in order to offer the patient the most rapid and effective rehabilitation possible. The prevention of disability, evaluation, maintenance and improvement of the functions of the musculoskeletal, neuromuscular, cardiovascular and respiratory systems of the individual define the goals of physical therapy (PT).

The physical therapy schools in the State of Texas have developed a common instrument for evaluation of entry level clinical competencies. The Mastery Assessment of Clinical Skills (MACS) describes the entry level skills the baccalaureate, master's, or certificate level graduate of physical therapy needs to engage in safe and effective clinical practice. The MACS includes skill statements related to orthopedics, neurology, internal medicine, physical therapy theory and ethics. The MACS was designed in 1977, utilized since 1978 and revised in 1979.

In order for the goals of physical therapy to be met, it is necessary that other health professionals be aware of their capabilities. A common evaluation tool for entry level competencies is a first step toward unifying the profession. Once that occurs, a systematic approach to educating the other health team professionals can be started.

Statement of the Problem

The physical therapy profession has expanded its task proficiencies to provide a means of improving quality care to orthopedic patients. At this time it is not known how aware the orthopedic physicians are of these expanded task proficiencies.

Purpose of Study

The purposes of the study were to:

1. Identify and compare the differences in knowledge and perceptions about physical therapy between orthopedic interns, residents, and faculty on selected entry level expectations set forth by the Mastery Assessment of Clinical Skills (MACS).

2. Compare the differences in knowledge and perception between each level of orthopedic residents on selected entry level expectations set forth by the MACS.

Research Questions

The research questions for this study were:

1. Are there differences in the knowledge of entry level physical therapy clinical skills between orthopedic interns, residents, and faculty?
2. Are there differences in the knowledge of entry level physical therapy clinical skills between the four levels of orthopedic residents?
3. Are there differences in the perceptions of entry level physical therapy clinical skills between orthopedic interns, residents, and faculty?
4. Are there differences in perceptions of entry level physical therapy clinical skills between the four levels of orthopedic residents?

Operational Definitions

The operational definitions of the study were:

1. Entry level Physical Therapy Competencies--The minimum skills to be mastered prior to entry into practice as a safe and effective physical therapy clinician. Synonyms that will be used for this operational definition are: role, clinical skills, and task competencies
2. Physical Therapy (PT)--The prevention of disability; evaluation, maintenance, and improvement of the

functions of the musculoskeletal, neuromuscular, cardiovascular and respiratory systems of the individual

3. Physical Therapist--A graduate from an accredited institution which offers a program of physical therapy and capable of performing the entry level skills for physical therapy
4. Mastery Assessment of Clinical Skills (MACS)--An evaluation tool indicating expected entry level competencies. The MACS is used by the physical therapy students, faculty, and clinicians in the State of Texas. The edition used is the 1979 revision
5. Orthopedics--A medical subspecialty that includes the investigation, preservation, restoration, and development of the form and function of the extremities, spine and associated structures by medical, surgical and physical methods
6. Orthopedic intern (O_1)--A licensed physician in his first postgraduate year of orthopedic specialization. This includes rotations in surgery, medicine, obstetrics and electives during a general surgery internship
7. Orthopedic resident (O_2)--A licensed physician in his second postgraduate year of orthopedic

specialization. This includes nine months of ward responsibilities at a primary teaching hospital and three months of electives

8. Orthopedic resident (O_3)--A licensed physician in his third postgraduate year of orthopedic specialization. This includes six months of ward responsibilities and six months at a private hospital assisting in surgery
9. Orthopedic resident (O_4)--A licensed physician in his fourth postgraduate year of orthopedic specialization. This includes six to nine months of rotation at a children's facility and three months of electives
10. Orthopedic resident (O_5)--A licensed physician in his fifth and final postgraduate year of orthopedic residency. This includes the responsibilities of being the senior resident at primary teaching hospitals, as well as three to six months of
• orthopedic electives
11. Orthopedic faculty--A licensed physician with specialization in orthopedics involved in teaching orthopedic interns and residents on a full or part-time basis
12. Perceptions--A mental image or intuitive cognition

Limitations

The limitations of the study included the following:

1. The study was limited to selected primary teaching hospitals of Texas Medical Schools affiliated with Allied Health Schools with a Department of Physical Therapy using the MACS
2. The data were collected during the first four weeks of July 1981
3. Only selected items of the MACS were used in the survey
4. The reliability and validity of the survey instrument were not determined

Assumptions

The assumptions of this study were:

1. The MACS is an accepted evaluation tool of entry level clinical competencies which is used by physical therapy students, faculty, and clinicians in the State of Texas
2. The orthopedic interns, residents, and faculty indicated their perceptions and knowledge of entry level clinical competencies accurately
3. The method of distribution of the questionnaire did not bias the results

Significance of Study

Awareness of the entry level physical therapy competencies may allow the referring orthopedic physicians a better opportunity to utilize the skills and services of the physical therapy professional. It is important to ascertain the perceptions of other health care personnel, especially orthopedic physicians because of their close working relationship with physical therapy. If discrepancies exist between the knowledge and perception of physical therapy, the physical therapy profession should attempt to clarify the role of the physical therapist. This will enable the therapists to function as a more efficient and effective part of the health team. Physical therapy, utilized to its fullest potential, enhances the ultimate goal of the health professions--quality patient care.

CHAPTER II

REVIEW OF LITERATURE

Role Delineation

Role identity is a major consideration in inter-professional relationships. For health care teams to work efficiently, each individual must understand the contributions and particular competence of the other team members (McCally, 1977). Teamwork is something that is created and does not just happen--it must be learned (Schreier, 1979).

The concept of role is developed in relation to social interaction. A sociological explanation of role is that role is the patterned way in which people in various positions interact with others based on mutual expectations. The acquisition of particular social roles throughout development constitutes an individual's identity. Social identity is an image obtained from membership and a role within a group (McKee, 1974).

In health care there is a certain role expectancy. The individual's actual response to the expectancy is role playing. The position within a social system for role playing is called status. Role conflicts may develop when there are strains and conflicts in role playing and

competing pressures for status. The perceived role of what an individual believes he should do may not coincide with the performed role which is subject to the pressures and opportunities of all or many who guide his actions (Broom, 1978).

Numerous studies have evidenced the dilemma of role identity among health professionals. A study surveyed the attitudes of the primary care physicians' perceptions of pharmacists and physician's assistants' roles regarding drug monitoring, prescription and clinical counseling. It was found that the physicians were much more in favor of the physician's assistant assuming that responsibility rather than the pharmacist. The article emphasized the need to inform the physician of the capabilities and ambitions of today's pharmacists because acceptance by the physician of the pharmacist in these roles is a necessary prerequisite to the expansion of the pharmacists' activities in these areas (McCay, 1976).

Physicians' attitudes and perceptions toward the nurse practitioner have been done in several settings. Holzemer's 1978 hypothesis was that low opinion of the nurse practitioner appears to be partially due to the shortage of pediatricians associated with nurse practitioners. It was suggested that pediatricians might work with nurse

practitioners during their residencies to develop an appropriate understanding of both the role and capabilities of a nurse practitioner.

Lack of sufficient information about the nurse practitioner was also cited as a problem in the Fottler, 1978 study of nurse practitioners. The results indicated that receptivity of employment for nurse practitioners in New York State was low due to a perceived lack of incompatibility with the physicians' practice and a perceived low advantage for adoption of the use of a nurse practitioner. Recent medical graduates, physicians in a group practice, and physicians who already delegated many tasks to nurses were the most receptive to hiring a nurse practitioner.

This philosophy was reiterated by the Little, 1980 article on nurse practitioner/physician relationships. The article compared the nurse practitioner's role in two settings. It was found that physicians have traditionally worked as solo practitioners. Thus, they have either limited or no experience in working with other health care professionals in a "collegial" relationship. In one typical role setting, the nurse practitioner was perceived as a "guest." The guest definition implied no ownership (of the practice), no control over the way the practice is run, very little input as to who is invited (scheduled for her to see). The other setting suggested a more collegial

atmosphere. Counseling, teaching and health maintenance appeared to have a high priority with the physicians. The nurse practitioner performed in this role more than in delegated tasks.

Celentano (1980) emphasized that the new health professionals (Nurse Practitioners, Physicians Assistants) must evolve a unified conception of their own roles. Until that time, physicians will continue to have a difficult time in perceiving and utilizing them accurately.

A study of social workers in medical settings asked the question "who defines us?" (Carrigan, 1978). It stated that in order for the social workers to clearly understand the role of the social worker, it was necessary to standardize their tasks and functions through the use of a scientific process. As of 1978, the National Association of Social Workers had no universally accepted definition of social work that clearly established what social workers do as contrasted to other professionals. The study found that large differences existed between the ways social workers and physicians defined social work practice in medical settings. The author suggested that it becomes extremely important for social workers to do a better job of communicating their present practices and expectations for practice to both physicians and nurses as it is these professionals

who presently define what social workers can and cannot do in medical settings.

Lister (1980) revealed numerous areas in which role expectations overlapped or conflicted between different health professionals. He distributed a questionnaire containing thirty-six health care tasks to individuals from thirteen health professions. The responses were obtained prior to preparing a series of community conferences on the team approach for health care services to cancer patients. The results indicated that the professionals often misperceived each other's roles. This could lead to conflict or be a potential source of role diversity.

The lack of sufficient information regarding allied health professionals is a concern realized by physicians and other medical institution personnel. A survey of South African interns' attitudes (Schrier, 1979) toward their medical education revealed that their medical education had prepared them more adequately for dealing with manual tasks than with the appropriate use of allied health care professionals. As the health care function of allied health care professionals was not fully appreciated, their services were not fully utilized. Although 78 percent of the interns had referred at least one patient to physical therapy, only 41 percent had referred a patient to social work. Twenty-three percent of these same interns had referred a

patient for speech therapy, and 66 percent had never referred a patient for occupational therapy. It was suggested that the relatively low referral rates to allied health professionals was due to a shortage of these services, and ignorance of the role of these personnel, or the lack of understanding of when these services were required.

A Hallauer (1979) study of family medicine residents in California reiterated the increased regard and more accurate perception of selected allied health personnel (physical therapy, occupational therapy, speech therapy, and social work) following a two month rotation in a physical medicine department. Their perceptions of allied health care were recorded prior to and after the rotation.

The Engles (1979) article dealing with physical therapists instructing medical students in the musculoskeletal examination process found that the program had been ongoing for five years and was consistently highly evaluated. The therapists discussed with the medical students the following: surface inspections of bony landmarks, determination of range of motion and muscle strength, observation of basic components of gait, administration of surface tests for ligamentous stability, and joint tissue pathology. Pre- and post-session questionnaires indicated that 90 percent of the medical students felt comfortable

having therapists instruct them in the musculoskeletal examination. Forty percent indicated the experience changed their opinions of physical therapists, whether confirming previous expectations or increasing their positive opinions about the orthopedic knowledge that physical therapists' process. Fifty-seven percent thought that physical therapists had a bachelor's or master's degree. Forty-two percent thought they had a bachelor's degree followed by a one or two year special program. In response to eleven questions on what problems physical therapists evaluated and what activities they may perform, the medical students showed a higher degree of confidence in the knowledge of physical therapists than in their practical activities.

A 1980 article by Mercer found Canadian physiotherapists increasing their autonomy because of new opportunities in the health services where doctors were unwilling or too busy to become involved. This increased autonomy has been expanding since 1978 when physicians could refer directly to physiotherapists. Prior to that time, the patient had to be referred to a physical medicine consultant and then to the physiotherapist. The orthopedists in Canada were the first to demand direct referral as they worked so closely with the physiotherapists.

This article also suggested that physiotherapists are more autonomous than nurses. They are given a diagnosis

and are then left to carry out a treatment. They also had more authority to modify and terminate treatments.

Suggestions for improving role identity were delineated in several articles. Integrating allied health students during their education and training was one method of achieving this goal (McCally, 1977). Other methodologies included the multidisciplinary case conferences and ward rounds. This methodology provided more clinical opportunities for learning about total patient care which involves all members of the team (Park, 1978). The use of health care professionals in teaching the medical school courses may foster the team approach concept and respect for other health care personnel early in the physicians training (Lowe, 1978).

Improving role identity by clearly defining task expectations may resolve role ambiguity. This clarification of task expectations would avoid conflicting task expectations; the team should not suffer from role overload. Each should be able to meet his task expectations, and function more efficiently and effectively (Carrigan, 1978).

The Mastery and Assessment of Clinical Skills Instrument

The use of the MACS as the clinical evaluation tool accepted by educators and clinicians of Texas Physical Therapy Schools evolved from a federal consortium grant for

physical therapy clinical education. It describes the entry level skills the baccalaureate, master's, or certificate graduate needs to engage in safe and effective clinical practice. The MACS serves several purposes: 1) defines for the physical therapy students and their clinical instructors skills that all students are expected to master before they graduate, 2) allows students the opportunity to assess their own performance and to compare their self-assessments with the assessment of their clinical instructor, 3) provides a uniform mechanism for rating students from all Texas schools at all physical therapy clinical affiliation sites, 4) provides an up-to-date summary of the individual student's strengths and weaknesses, and 5) helps the physical therapy students and their instructors plan an appropriate affiliation experience.

The grant was awarded to the School of Physical Therapy at Texas Woman's University in July 1977 and extended through July 1980. The following Texas Physical Therapy programs in the state participated in the planning: Texas Woman's University, The University of Texas Health Science Center at Dallas, and The University of Texas Medical Branch at Galveston. No provisions were made in the initial grant for assessing the reliability and validity of the MACS.

CHAPTER III

METHODOLOGY

A descriptive research methodology was employed in this study. A survey format was utilized for gathering data. The components of this chapter are: population and sample, collection of data, instrument, and data analysis.

Population and Sample

The population consisted of orthopedic interns, residents, and faculty of selected primary teaching hospitals of Texas Medical Schools affiliated with Allied Health Schools with a Department of Physical Therapy. These included: The University of Texas Health Science Center at Dallas (Parkland Memorial Hospital), Baylor Medical School (Ben Taub Hospital), The University of Texas at Houston (Hermann Hospital), and The University of Texas Health Science Center at San Antonio (Bexar County Hospital). All of the aforementioned hospitals house 800 or more beds, a major trauma center, and offer similar teaching situations to the house staff. Each level of orthopedic specialization was included in the sample at each facility.

Collection of Data

A letter of cooperation was obtained from the department heads of orthopedic surgery at each hospital and university prior to data collection (appendix A). A copy of the results was sent to each facility.

The questionnaires were mailed to the Baylor and University of Houston facilities, distributed by the coordinator of resident education during a grand round, and returned by mail to the investigator. The investigator was present for grand rounds at The University of Texas Health Science Center at San Antonio. The questionnaires were distributed at the beginning of the grand rounds and collected at the end of the grand rounds by the investigator. The responses from The University of Texas Health Science Center at Dallas were obtained by mailing individual copies to each resident and house staff member. Names and addresses for this facility were provided by the orthopedic department at The University of Texas Health Science Center at Dallas. An introductory cover letter accompanied each questionnaire (appendix B). Return of the questionnaire indicated consent to act as a subject in the study.

Instrument

Content

The entire list of the entry level physical therapy competencies from the MACS, totaling 45 items, was given to a convenient sample of seven physical therapists. The optional skills were not included. The judges were all licensed physical therapists currently practicing in an acute care hospital with two to five years of clinical experience. The judges utilized a Q-sort methodology and eleven clinical competencies were selected at the .05 level of significance. The MACS (1979) competency statements were:

Physical Therapists:

1. Perform accurate measurements of muscle strength in patients with varied neuromuscular, musculoskeletal, and developmental disorders.
2. Assesses patients' needs for functional training by performing function (A.D.L.) tests including bed mobility, sitting and standing balance, transfers, ambulation and elevation.
3. Evaluated sensation of patient through physical examination for program planning and patient education.
4. Assesses need for and fit of orthotic/prosthetic devices.
5. Evaluated abnormal muscle tone through physical examination and therapeutic handling of patients.

6. Performs gait analysis.
7. Utilizes joint mobilization in the evaluation and treatment of patients.
8. Performs treatments designed to improve or maintain muscular strength and/or endurance with or without the use of equipment.
9. Performs facilitation/inhibition techniques to improve sensorimotor function.
10. Helps determine the need for and/or monitors the wearing of casts/splints for patients with varied neuromuscular and/or musculoskeletal disorders.
11. Applies therapeutic modalities such as heat, cold, electricity, traction in a safe, effective manner.

Format

An investigator-made questionnaire was designed to measure the knowledge and perceptions of selected entry level physical therapy competencies by orthopedic interns, residents, and faculty (appendix C). This questionnaire had three sections: 1) a demographic section which included the level or orthopedic specialization, 2) a forced response to eleven selected entry level physical therapy clinical skills to measure knowledge, and 3) a Likert-like scale to measure perceptions of the skills.

The Likert-like scale is easy to construct, administer, grade and required less subjects than other attitudinal scales. This type of scale indicates whether

a change occurs but it cannot indicate the degree of the change. Two individuals may obtain the same score on the questionnaire by combining the scores into a composite score (Hoskins, 1978).

Scoring

The subjects were requested to check their yes/no response to whether each item was a physical therapy skill. The sample population was then asked to choose their response to the scale by indicating their answer in one of the four categories. These categories were: 1) strongly agree (SA), 2) agree (A), 3) disagree (D), and 4) strongly disagree (SD).

The instrument was scored by using the following methodology. Numerical values were assigned: 2 for yes, 1 for no in the knowledge section. Numerical values of four for strongly agree, three for agree, two for disagree, and one for strongly disagree were assigned to the ranked perception scores. The composite score was the sum of the item scores for each question.

Data Analysis

The following programs were used for statistical analysis: One-way analysis of variance, Student-Newman-Keuls, Chi square, Two-factor analysis of variance, and

Fisher exact probability test. The .05 level was considered significant. A .05 to 2.0 level indicated a tendency toward significance. The programs were all run utilizing the Texas Woman's University computers and employed the Statistical Package for the Social Sciences (SPSS).

The simple, one-way analysis of variance was employed in this study to determine whether there was a significant difference between group means. Two or more means at a selected probability level were needed for data interpretation. This study provided three to four means at a .05 probability level. An F-ratio compared the total variation by using the variance between groups and the variance within groups. Statistical significance was indicated if the variance between groups (due to treatment) was larger than the variance within groups (due to error).

The Student-Newman-Keuls is a multiple comparisons test. It is appropriately used when a significant difference occurs in an analysis of variance. It was used in this study for comparing subsets of means from a larger set of means to determine which pairs of sample means were significantly different.

Chi square was utilized as a nonparametric test of significance to evaluate the questionnaire. It compared the association or relationship between the different

categories of each question. For the question to be statistically significant, the observed frequencies had to differ from the expected frequencies other than by chance. Chi square values increase the more the observed proportions differ among the groups being contrasted. Results are presented in contingency tables containing the tabulations of frequencies for the categories.

The Fisher exact probability test was also utilized to evaluate the questionnaire. It functions very similarly to Chi square but is appropriate to use when the cell size is too small for accurate Chi square analysis.

Two-factor analysis of variance is a factorial design test allowing examination of two or more independent variables simultaneously. Factorial designs can increase the probability of detecting real effect. A variable found not to be effective in a single-variable experiment may be found to interact significantly with another variable. Two-factor analysis of variance was used in this study to determine whether an interaction existed between the factors used in two-way analysis of variance.

CHAPTER IV

RESULTS

Introduction

This study investigated current knowledge and perceptions of entry level physical therapy clinical skills between orthopedic interns, residents, and faculty. The results of this investigation are presented in this chapter.

The level of orthopedic specialization was the only demographic information collected. The greatest number of respondents (55) were residents. The resident classification was then subdivided into the specific year of orthopedic training. The faculty had 19 respondents. The least number of respondents fell in the intern classification with 11 (see table 1).

Research Questions

• In the analysis of the data, each of the four research questions were tested using one-way analysis of variance of the cumulative subject scores. If a significant difference appeared in the analysis, each question was then judged individually for further investigation.

TABLE 1

CLASSIFICATION OF PARTICIPATING ORTHOPEDIC
INTERNS, RESIDENTS, AND FACULTY

Group and Level of Orthopedic Training	Total Number
Interns	11
Residents	55
2nd year (15)	
3rd year (17)	
4th year (11)	
5th year (12)	
Faculty	19
Total	85

Question 1

The first research question was: "Are there differences in the knowledge of entry level physical therapy clinical skills between orthopedic interns, residents, and faculty?" It was concluded that significant differences ($p = 0.0416$) existed in the knowledge of entry level physical therapy skills between interns, residents and faculty (see table 2). A multiple range test (Student-Newman-Keuls) revealed that interns and faculty differed most in their knowledge. The faculty exhibited more knowledge of physical therapy entry level skills than interns.

TABLE 2

ANALYSIS OF VARIANCE FOR KNOWLEDGE OF ENTRY LEVEL
PHYSICAL THERAPY SKILLS BETWEEN INTERNS,
RESIDENTS, AND FACULTY

Source	d.f.	Sum of Squares	Mean Squares	F-Ratio	F- Probability
Between groups	2	15.23	7.61	3.307	0.0416*
Within groups	82	188.82	2.30		
Total	84	204.05			

*Significant level = $p \leq .05$.

Inferential statistics using Chi square were then applied to each question on the questionnaire. Summary of that data appears in table 3. The validity of these questions could not be determined due to the small cell size.

Question 2

No significant difference in knowledge of entry level physical therapy clinical skills was found (see table 4) between the resident levels.

Question 3

No significant difference was found (see table 5) in the perceptions of entry level physical therapy clinical skills between interns, residents, and faculty.

TABLE 3

CHI SQUARE FOR FURTHER INVESTIGATION OF KNOWLEDGE OF PHYSICAL THERAPY CLINICAL
SKILLS BY ORTHOPEDIC INTERNS, RESIDENTS, AND FACULTY

Skill Statement	Interns				Residents				Faculty				x ²	Signifi- cance
	Yes		No		Yes		No		Yes		No			
	N	%	N	%	N	%	N	%	N	%	N	%		
1. Performs accurate mea- surements of muscle strength in patients with varied neuromus- cular, musculoskele- tal, and developlental disorders.	10	91	1	9.1	53	96.4	2	3.6	19	100	0	0	xxx	xxx
2. Assesses patients' need for functional training by performing function (A.D.L.) tests includ- ing bed mobility, sit- ting, and standing balance, transfers, and ambulation.	11	100	0	0	52	94.5	3	5.5	19	100	0	0	xxx	xxx
3. Evaluates sensation of patient through physi- cal examination for program planning and patient education.	8	72	3	27.3	40	75.5	13	24.5	17	89	2	11	xxx	xxx

TABLE 3--Continued

Skill Statement	Interns		Residents		Faculty		x ²	Signifi- cance
	Yes	No	Yes	No	Yes	No		
	N %	N %	N %	N %	N %	N %		
4. Assesses need for and fit of orthotic/prosthetic devices.	2 18.2	9 81.8	18 33.3	36 66.7	10 56	8 44	4.661	0.097
5. Evaluates abnormal muscle tone through physical examination and therapeutic handling of patients.	9 81.8	2 18.2	49 89.1	6 10.9	17 90	2 10	xxx	xxx
6. Performs gait analysis.	7 63.6	4 36.4	48 87.3	7 12.7	18 95	1 5.3	5.81	0.055
7. Utilizes joint mobilization in the evaluation and treatment of patients.	11 100	0 0	53 98	1 2	17 90	2 10	xxx	xxx
8. Performs treatments designed to improve or maintain muscular strength and/or endurance with or without the use of equipment.	11 100	0 0	55 100	0 0	18 95	1 5	xxx	xxx

TABLE 3--Continued

Skill Statement	Interns		Residents		Faculty		x ²	Signifi- cance
	Yes	No	Yes	No	Yes	No		
	N %	N %	N %	N %	N %	N %		
9. Performs facilitation/ inhibition techniques to improve sensori- motor function.	9 81.8	2 18.2	43 81.1	10 18.9	16 84	3 16	xxx	xxx
10. Helps determine the need for and/or moni- tors the wearing of casts/splints for patients with varied neuromuscular and/or musculoskeletal disorders.	5 45	6 55	36 65	19 35	16 84	3 16	4.919	0.085
11. Applies therapeutic modalities such as heat, cold, electric- ity, traction in a safe, effective manner.	9 82	2 18	53 96.4	2 3.6	18 95	1 5	xxx	xxx

Note: xxx = validity could not be determined due to small cell size.

TABLE 4

ANALYSIS OF VARIANCE OF KNOWLEDGE OF ENTRY
LEVEL PHYSICAL THERAPY SKILLS BETWEEN
LEVEL OF RESIDENTS

Source	d.f.	Sum of Squares	Mean Squares	F-Ratio	F- Probability
Between groups	3	8.88	2.96	1.467	0.234
Within groups	51	102.87	2.01		
Total	54	111.75			

TABLE 5

ANALYSIS OF VARIANCE OF PERCEPTIONS OF ENTRY
LEVEL PHYSICAL THERAPY SKILLS BETWEEN
INTERNS, RESIDENTS, AND FACULTY

Source	d.f.	Sum of Squares	Mean Squares	F-Ratio	F- Probability
Between groups	2	39.90	19.95	1.06	0.35
Within groups	82	1544.29	18.83		
Total	84	1584.19			

Question 4

The fourth research question was: "Are there differences in perceptions of entry level physical therapy clinical skills between the four levels of orthopedic

residents?" The one-way analysis of variance indicated a tendency toward a significant difference ($p = 0.163$) existed (see table 6).

TABLE 6

ANALYSIS OF VARIANCE OF PERCEPTIONS OF ENTRY
LEVEL PHYSICAL THERAPY SKILLS BETWEEN
LEVELS OF RESIDENTS

Source	d.f.	Sum of Squares	Mean Squares	F-Ratio	F- Probability
Between groups	3	96.65	32.22	1.780	0.163
Within groups	51	923.06	18.10		
Total	54	1019.71			

To investigate further the tendency toward significance in the perceptions of entry level physical therapy clinical skills between the four levels of orthopedic residents, a two-factor analysis of variance was utilized. Schools A, B, and C were grouped and classification years two to four were also grouped (see table 7).

Further investigation of these perception differences between levels of orthopedic residents was done by applying the Fisher exact probability test to each question. The Fisher exact test was used due to the small cell sizes in the two-factor test. The only groupings

showing a tendency toward significance were the combination of schools A, B, and C versus school D. The strongly agree ranking for each question was also analyzed against the combined agree, disagree, and strongly disagree rankings at each school.

TABLE 7

TWO-FACTOR ANALYSIS OF VARIANCE OF PERCEPTIONS
OF ENTRY LEVEL PHYSICAL THERAPY SKILLS
BETWEEN LEVELS OF ORTHOPEDIC
RESIDENTS

	Schools A, B, C	School D
Resident (Years 2, 3, 4)	Mean = 20.00 N = 31	Mean = 16.50 N = 12
Resident (Year 5)	Mean = 17.38 N = 8	Mean = 15.50 N = 4

The results of the Fisher exact probability test consistently showed a more favorable (SA) perception by the respondents at school D regarding the selected physical therapy skills. All of the residents at all schools indicated a negative tendency toward entry level physical therapy performance of skills 4, 6, and 10. These skills dealt with orthotics/prosthetics, gait analysis, and casts/splints, respectively. Skills 7 and 11 dealing with

joint mobilization and therapeutic modalities were statistically invalid due to small cell size, but were seen as favorable by all levels of residents at all schools by percentage (see table 8).

In summary, this analysis would seem to indicate there are significant differences in knowledge of entry level physical therapy clinical skills between orthopedic interns and faculty but not a significant difference between residents when compared to interns, faculty, or within their classification. Additional statistical tests revealed a progression of knowledge from internship, residency, to faculty.

Initial analysis revealed no significant difference in perceptions of entry level physical therapy clinical skills between orthopedic residents. However, a tendency toward significant difference was seen when one school's resident response was separated and compared to the other three schools. The residents from school D had a more favorable perception of physical therapy clinical skills than the other three schools. Comments on these findings are presented in chapter V.

TABLE 8

RESULTS OF FISHER EXACT PROBABILITY TEST

Skill Statement	Schools A, B, C				School D				Signifi- cance p =
	SA		Other Opinion		SA		Other Opinion		
	N	%	N	%	N	%	N	%	
1. Perform accurate measurements of muscle strength in patients with varied neuromuscular, musculoskeletal and developmental disorders.	23	59	16	41	14	87.5	2	12.5	0.138
2. Assesses patients' need for functional training by performing function (A.D.L.) tests including bed mobility, sitting, and standing balance, transfers, and ambulation.	24	61.5	15	38.5	14	87.5	2	12.5	0.054
3. Evaluates sensation of patient through physical examination for program planning and patient education.	7	18.9	30	81	7	43.7	9	56.3	0.064
4. Assesses need for and fit of orthotic/prosthetic devices.	6	15.79	32	84.2	1	6.7	14	93	0.351
5. Evaluates abnormal muscle tone through physical examination and therapeutic handling of patients.	13	34.2	25	65.8	9	56.3	7	43.8	0.115

TABLE 8--Continued

Skill Statement	Schools A, B, C				School D				Signifi- cance p =
	SA		Other Opinion		SA		Other Opinion		
	N	%	N	%	N	%	N	%	
6. Performs gait analysis.	13	33.3	26	66.7	5	31.3	11	68.6	0.572
7. Utilizes joint mobilization in the evaluation and treatment of patients.	21	55.3	17	44.7	10	62.5	6	37.5	0.427*
8. Performs treatments designed to im- prove or maintain muscular strength and/or endurance with or without the use of equipment.	23	59	16	41	13	81.3	3	18.8	0.100
9. Perform facilitation/inhibition techniques to improve sensori- motor function.	12	32.4	25	67.6	12	80	3	20	0.002*
10. Helps determine the need for and/or monitors the wearing of casts/splints for patients with varied neuromuscular and/or musculaskeletal disorders.	4	10.26	35	89.7	4	25	12	75	0.161
11. Applies therapeutic modalaties such as heat, cold, electricity, trac- tion in a safe, effective manner.	21	53.9	18	46.1	11	68.8	5	31.2	0.238

*Significant level = $p < 0.05$.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

Summary

This survey was conducted to determine if differences in knowledge and perception existed between orthopedic interns, residents, and faculty on selected entry level physical therapy clinical competencies from the Mastery Assessment of Clinical Skills. The convenient sample of orthopedic interns, residents, and faculty was from four selected primary teaching hospitals of Texas Medical Schools affiliated with Allied Health Schools with a Department of Physical Therapy.

The research tool developed by the investigator was structured to survey knowledge of selected entry level physical therapy clinical skills and perceptions toward each skill. Three sections were incorporated into the design of the questionnaire. The first section included demographic information on the orthopedic level specialization. The second section presented selected entry level physical therapy clinical skills and asked if they were or were not a physical therapy skill (knowledge). The third section ranked response perceptions to each selected

physical therapy entry level skill (SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree). The data collection phase of the study was July and August 1981. The completed questionnaires were returned by mail or were picked up by the investigator, depending on the sample site. The data were analyzed to answer the research questions. The primary analysis was done by using one-way analysis of variance on each question. Further investigation of the research questions required the application of Student-Newman-Keuls, Chi square, Fisher exact probability and two-way analysis of variance.

Discussion

Analysis of knowledge differences between interns, residents, and faculty was statistically significant at $p = 0.042$. The use of Chi square for inferential statistical analysis revealed an acquisition of knowledge from internship, residency, to faculty in those skills that were statistically valid. This seems a logical acquisition of knowledge by exposure to physical therapy and experience in working with physical therapists. Respect for the educational background and cooperative experience of a team approach to health care may also contribute to increased knowledge of physical therapy skills.

Analysis of knowledge differences failed to reveal a significant difference between classification of residency. It may be assumed that initial concepts regarding the selected clinical skills does not greatly alter during these years.

No significant difference between interns, residents, and faculty in the attitude toward selected entry level physical therapy competencies was observed. When an analysis of perceptions of physical therapy among residents classifications was done, a tendency toward significance ($p = 0.163$) was noted. Two-factor analysis of variance evidenced the supposition that the tendency for difference was due to the orthopedic training program with which the resident was affiliated. Further investigation of these perception discrepancies due to location were verified by the Fisher exact probability test. The results indicated an overall more favorable perception of entry level physical therapy clinical skills by the residents from school D than from the other three schools. This more favorable attitude was also present in the skill statements which were not viewed by all residents as physical therapy skills in addition to those skills that were considered favorable by all residents. This may indicate a strong faculty support and utilization of

physical therapy, thereby enhancing perception of physical therapy to residents.

Collaboration and cooperation between all the health team members is essential for achieving the end result--quality patient care. Development of professional trust, mutual respect, and open communication among the health professionals could aid the team member's role and resolve conflicts. Interdisciplinary programs in a non-threatening setting, undergraduate education and team conferences could aid the establishment of mutual expectations for health care members.

Conclusions

The only statistically valid finding in this study was a knowledge difference between orthopedic interns and faculty ($p = 0.042$). No significant differences appeared in the knowledge between resident classification. No significant differences appeared in the perceptions of orthopedic interns, residents, level of residency, or faculty regarding the selected entry level physical therapy skills. Additional findings indicated a tendency toward perception differences dependent on the location of the orthopedic training program.

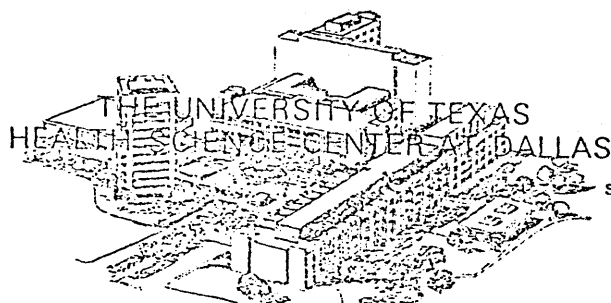
Recommendations

Based on the data in this study, recommendations for future investigations are:

1. Replication of this study using a larger sample including other states and allied health schools with a Department of Physical Therapy
 2. Replication of this study using orthopedic training programs not affiliated with an allied health school with a Department of Physical Therapy
 3. Replication of this study surveying other medical subspecialties
 4. Replication of this study surveying other health care professionals
 5. Additional investigation and more comprehensive survey of physicians' knowledge and perceptions toward a greater number of selected physical therapy skills
 6. Investigate orthopedic faculty's curriculum emphasis on the roles of allied health professionals
- .

APPENDIX A

WRITTEN CONSENT OF FACILITIES



ORTHOPEDIC SURGERY

SOUTHWESTERN MEDICAL SCHOOL

May 1, 1981

Sandra Nelson Kristoferson
 12015 High Valley
 Dallas, Texas 75234

Dear Mrs. Kristoferson:

In response to your recent letter to me, the Orthopedic Division at Southwestern Medical School would be very pleased to participate in your survey. All of the orthopedic residents have boxes in the orthopedic library, however, the incoming orthopedic interns will have boxes at Parkland Hospital as of July 1st, 1981. These boxes are located in the Parkland House Staff mail room. All of the residents, including those rotating at the Veterans Hospital, and Scottish Rite Hospital periodically check thier mail boxes in the library, so I would strongly recommend that you use these boxes for your distribution.

I wish you the best with your work, and if I can be of further assistance please let me know.

Sincerely yours, _____

Dissertation/Theses signature page is here.

To protect individuals we have covered their signatures.

Baylor College of Medicine
DIVISION OF ORTHOPEDIC SURGERY • 713 790-3112



May 13, 1981

Sandra Nelson Kristoferson
12015 High Valley
Dallas, Texas 75234

Dear Ms. Kristoferson:

Thank you for your interest in wanting to submit your survey on Physical Therapy entry level competencies to our staff.

Our Grand Rounds are held every Friday at 7:45 a.m. and you are welcome to come any Friday. Since our July schedule has not been completed yet, please call the latter part of June to confirm a date. You may call us at (713) 790-2178.

Sincerely yours,

Dissertation/Theses signature page is here.
To protect individuals we have covered their signatures.

Medical
School

Department of
Surgery
Division of
Orthopaedic Surgery



The University
of Texas
Health Science Center
at Houston

Taylor K. Smith, M.D.
Professor and Chief

Richard D. Guyer, M.D.
Assistant Professor

Arthur F. Terry, M.D.
Assistant Professor

Medical School, Rm. 6.154
6431 Fannin
Houston, Texas 77030
(713) 792-5636


5 May 1981

Ms. Sandra Kristoferson
12015 High Valley
Dallas, Texas 65234

Dear Ms. Kristoferson:

I would be happy to cooperate with you on your housestaff survey. The best time for presentation of your survey material would be at a 7 o'clock meeting of the housestaff which occurs every Thursday morning in the Birch Room at Hermann Hospital. You are more than welcome to attend one of those meetings and conduct your survey. Please contact my office to let me know when you will be doing this.

Sincerely,


Taylor K. Smith, M.D.



The University of Texas
Health Science Center at San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78284

Medical School
Department of Surgery
Division of Orthopaedics

(512) 691-6138
(512) 691-7152

12 May 1981

Sandra Kristoferson
12015 High Valley
Dallas, Texas 75234

Dear Ms. Kristoferson:

In reference to your letter requesting permission to take a survey of the housestaff regarding knowledge and perception of Orthopaedic interns, residents and faculty regarding Physical Therapy entry level competencies.

You are most welcome to come to our grand rounds on July 13, 1981. Ground rounds start at 7:30 - 9:00 a.m. in Room 444B in the Medical School. If this date is satisfactory, will you please call us collect and confirm it.

If I can be of any further assistance to you please let me know.

Sincerely,

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To protect individuals we have covered their signatures.

APPENDIX B

SUBJECTS INFORMED CONSENT

This questionnaire is designed to measure your perceptions of Physical Therapy and the entry-level clinical competencies required for safe and effective practice.

The following statements indicate selected requisite skills in Physical Therapy. Please check the appropriate space which corresponds most closely with your knowledge and opinion of the Physical Therapist's clinical skills.

This questionnaire is to remain anonymous. Do not put your name on the form. Identification for statistical purposes will be by your orthopedic post-graduate classification. The results will be summarized and made available to the Department of Orthopedic Surgery.

I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED
CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH. The subject further understands that no medical service or compensation is provided to the subject by the university as a result of injury from participation in the research.

APPENDIX C

QUESTIONNAIRE

PERCEPTIONS OF ENTRY LEVEL PHYSICAL THERAPY CLINICAL SKILLS

Please check the appropriate classification:

☐ 1st year intern ☐ 4th year resident
☐ 2nd year resident ☐ 5th year resident
☐ 3rd year resident ☐ Faculty/Attending

DIRECTIONS

Please check the appropriate space which corresponds most closely with your knowledge and opinion of the Physical Therapist's clinical skills.

Key SA= Strongly Agree A=Agree D=Disagree SD=Strongly Disagree

Physical Therapists:

	Is this a PT skill?		Should a PT perform this skill?			
	Yes	No	SA	A	D	SD
1. Perform accurate measurements of muscle strength in patients with varied neuromuscular, musculoskeletal, and developmental disorders.						
2. Assesses patients' need for functional training by performing function (A.D.L.) tests including bed mobility, sitting, and standing balance, transfers, and ambulation.						
3. Evaluates sensation of patient through physical examination for program planning and patient education.						
4. Assesses need for and fit of orthotic/prosthetic devices.						
5. Evaluates abnormal muscle tone through physical examination and therapeutic handling of patients.						
6. Performs gait analysis.						
7. Utilizes joint mobilization in the evaluation and treatment of patients.						
8. Performs treatments designed to improve or maintain muscular strength and/or endurance with or without the use of equipment.						
9. Perform facilitation/inhibition techniques to improve sensorimotor function.						
10. Helps determine the need for and/or monitors the wearing of casts/splints for patients with varied neuromuscular and/or musculoskeletal disorders.						
11. Applies therapeutic modalities such as heat, cold, electricity, traction in a safe, effective manner.						

THANK YOU

APPENDIX D

APPLICATION TO HUMAN SUBJECTS

REVIEW COMMITTEE

APPLICATION TO HUMAN SUBJECTS REVIEW COMMITTEE

Subject: Research and Investigation Involving Humans

Statement by Program Director and Approved by Department Chairman

This abbreviated form is designed for describing proposed programs in which the investigators consider there will be justifiable minimal risk to human participants. If any member of the Human Subjects Review Committee should require additional information, the investigator will be so notified.

Five copies of this Statement and a specimen Statement of Informed Consent should be submitted at least two weeks before the planned starting date to the chairman or vice chairman on the appropriate campus.

Title of Study: The Perceptions of Entry Level Clinical Competencies
in Physical Therapy by Texas Orthopedic Interns, Residents,
and Faculty.

Program Director (s): Dr. Barbara Cramer , Dr. Mildred Pittman, Regina Michaels

Graduate Student: Sandra Nelson Kristoferson

Estimated beginning date of study: July 1, 1981

Estimated duration: July 31, 1981

Address where approval letter is to be sent:

12015 High Valley

Dallas, Texas 75234

Is this research being conducted for the thesis or professional paper?
Y X N ; for the dissertation? Y N .

1. Brief description of the study (use additional pages or attachments, if desired, and include the approximate number and ages of participants, and where they will be obtained).

The study is to investigate the knowledge and perception of Texas Orthopedic interns, residents, and faculty about selected Physical Therapy entry level clinical skills. The entry level skills for Physical Therapy were chosen from the Mastery Assessment of Clinical Skills (MACS). The MACS is the evaluation tool being utilized by all Texas Physical Therapy schools at the present time.

A questionnaire is to be used as the survey instrument. It is a Likert-like scale. The selected items were chosen by Q-sort methodology from the entire list of the MACS for Physical Therapy.

The questionnaire is to be distributed to orthopedic interns, residents and faculty during an Orthopedic Grand Rounds. The investigator will be present for distribution and collection. There are four Texas Departments of Orthopedics in the study, UTHSCD, UTHSCSA, UT-Houston and

2. What are the potential risks to the human subjects involved in this research or investigation? "Risk" includes the possibility of public embarrassment and improper release of data. Even seemingly nonsignificant risks should be stated and the protective procedures described in #3 below.

Potential risks could include embarrassment, both public and within peers. Improper release of data could result in inappropriate interpretation of data.

3. Outline the steps to be taken to protect the rights and welfare of the individuals involved.

No names will be requested for the survey. This should assist in reducing embarrassment for those subjects who fear repercussions by peers and the public. It will hopefully instill a confidence to answer the questionnaire honestly. The only demographic information requested will be the level of orthopedic training.

The data from the survey will be utilized for the thesis pub-

4. Outline the method for obtaining informed consent from the subjects or from the person legally responsible for the subjects. Attach documents, i.e., a specimen informed consent form. These may be properly executed through completion of either (a) the written description form, or (b) the oral description form. Specimen copies are available from departmental chairmen. Other forms which provide the same information may be acceptable. A written description of what is orally told to the subject must accompany the oral form in the application.

A letter of explanation about the proposal was sent to each of the Departments of Orthopedics in Texas. It requested 15 minutes of a Grand Rounds for distribution, completion, and collection of the questionnaire. It also requested an alternative situation if Grand Rounds was not the most effective means of reaching the participants. A written response of approval was obtained from all schools and is attached.

Question # continued

1. Baylor. There are 4-5 subjects at each level of training at each school and an indefinite number of faculty. The total number of participants should be approximately 100, 25-30 from each school. The ages will vary from 25 to approximately 60 years old for the participants.
3. lication only. Each school will receive a copy of the final, overall results, No school will be individually evaluated as it is assumed that all Texas Orthopedic residents receive a similar training experience.

5. If the proposed study includes the administration of personality tests, inventories, or questionnaires, indicate how the subjects are given the opportunity to express their willingness to participate. If the subjects are less than the age of legal consent, or mentally incapacitated, indicate how consent of parents, guardians, other qualified representatives will be obtained.

THE RETURN OF THE QUESTIONNAIRE CONSTITUTES THE INFORMED
CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH. No medical service or compensation is provided to subjects by the university as a result of injury from participation in research.

This will be placed on each subject's questionnaire.

Signature of
Approval

Program Director

Date _____

Signature of
Approval

Graduate Student

Date _____

Signature of
Approval

Dean, Department Head or Director

Date _____

Date received by Committee Chairman: _____

REFERENCES

REFERENCES

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