

PATIENT-CENTERED CARE IN REHABILITATION

THE EFFECTS OF PATIENT-CENTERED CARE IN REHABILITATION HEALTH
OUTCOMES

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Abstract:

THE EFFECTS OF PATIENT-CENTERED CARE IN REHABILITATION HEALTH OUTCOMES

Objective: The objective of this thesis is to identify the approaches to patient-centered care provision currently employed by clinicians and to identify patient perspectives of patient-centeredness in relation to pain and disability following distal radius fracture. This thesis includes a scoping review of patient-centered care frameworks and models, as well as a prospective cohort study.

Rationale: Patient-centered care provision has been linked with positive health outcomes, improved patient satisfaction, and reduced health costs. A uniform approach to patient-centered care in rehabilitation has yet to be developed primarily due to the breadth and scope of practice. Understanding current approaches to patient-centered care and patient perspectives on this care can serve as a foundation to future discussions on the development of a rehabilitation-specific approach to patient-centered care provision.

Data sources: Frameworks and models of patient-centered care provision were located via electronic database searches. The extracted frameworks and models were compared based on how they described strategies on achieving the three tenets of patient-centered care: communication, partnership, and health promotion. A prospective cohort study provided patient perspectives on patient-centeredness, pain, and disability following distal radius fracture at baseline and at three months post distal radius fracture in 129 patients.

Methods: Frameworks and models on patient-centered care provision were extracted from articles and placed in data summary tables for comparison and review. Information on how these frameworks and models described strategies for communication, partnership, and health promotion was collated and reviewed. The patients' perceptions of patient-centeredness, pain, and disability were determined from responses to the Patient Perceptions of Patient-Centeredness Questionnaire and the Patient Rated Wrist Evaluation. Outcome measure responses were analyzed to measure change over time (Wilcoxon Rank Sum and T-Test analyses) and to identify relationships (Pearson correlations).

Results: The scoping review found 19 articles, from which 25 patient-centered care frameworks or models were identified. All frameworks and models reported strategies on achieving effective communication, partnership, and health promotion. The prospective cohort study revealed significant correlations between patient perspectives of patient-centeredness and pain and disability following distal radius fracture. This suggests that positive experiences with patient-centered care provision are correlated with reduction in pain and improvement in function following an acute orthopaedic injury.

Implications: Until a rehabilitation-specific approach to patient-centered care provision is developed, rehabilitation clinicians can be confident that selection of one of the currently employed frameworks or models of patient-centered care will reflect the three tenets of patient-centered care provision. Adopting one of these patient-centered approaches to care provision likely will result in positive health outcomes.

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List of Abbreviations and Symbols

PCC: Patient-Centered Care

PPPC: Patient Perception of Patient-Centeredness Questionnaire

PRWE: Patient Rated Wrist Evaluation

SD: Standard Deviation

Declaration of Academic Achievement

Marissa Constand conducted the scoping review, analyzed the data obtained from the scoping review and is the lead author of the scoping review manuscript. This author also organized and analyzed the data for the prospective cohort study and is the lead author of this study's manuscript.

Dr. Joy MacDermid reviewed the articles extracted from the scoping review and co-authored the scoping review manuscript. This author also provided guidance during the analysis of the prospective cohort study and acted as co-author of this study's manuscript.

Dr. Vanina Dal Bello-Haas provided feedback on both manuscripts included in this thesis and served as co-author of these manuscripts.

Dr. Mary Law provided feedback on both manuscripts included in this thesis and served as co-author of these manuscripts.

Chapter One

INTRODUCTION

1.0 Rationale

Patient-centered care is defined as an approach to healthcare that takes into consideration the patient's needs, values, and perspectives when developing a treatment plan with a clinician (Stewart et al., 2003). While patient-centered care, also called client-centered care, is considered to be a fundamental component of rehabilitation, how it is operationalized and measured is not easily identifiable within the literature. Linked with positive health outcomes, patient satisfaction, and reduced health costs, researchers and clinicians are aware of the beneficial aspects of patient-centered care provision; however, a rehabilitation specific framework or model identifying strategies to achieve patient-centered care in rehabilitation has yet to be developed due to the breadth and scope of rehabilitation practice (Stewart et al., 2003). Therefore, research is needed to understand the current reporting of patient-centeredness in the literature and to contribute to the empirical evidence supporting patient-centered care in rehabilitation.

1.1 Research questions

The following two research questions will be answered by this thesis:

1. What patient-centered care models and frameworks currently exist to guide rehabilitation professionals' practice?
2. To what extent does patient-centered care contribute to the initial experience of pain and disability in people post distal radius fracture, and to the recovery achieved?

The primary objectives of this thesis are to:

1. Extract the patient-centered care models and frameworks employed in healthcare today via a scoping review of the literature.
2. Compare the patient-centered care models and frameworks extracted via the scoping review based on three key facets of patient-centeredness: communication, partnership, and health promotion.
3. Compare patient reported outcomes on perspectives of patient-centeredness with pain experiences and functional impairments following distal radius fracture.

This thesis identifies the frameworks and models of patient-centered care provision currently employed in healthcare using a scoping review. Results from the scoping review compare extracted frameworks and models based on their descriptions of approaches to achieving the three tenants of patient-centered care: communication, partnership, and health promotion.

Next, this thesis identifies how patients perceive patient-centered care to impact their pain and functioning following distal radius fracture. A sample of 129 patients with distal radius fractures completed two self-report questionnaires, the Patient Perceptions of Patient Centeredness Questionnaire (PPPC) asking patients to report their perceptions of how patient-centered their interactions with their clinician have been, and the Patient Rated Wrist Evaluation (PRWE) asking patients to report their pain and functioning. Changes in outcome measure scores over time and any relationships between the PPPC and PRWE were analyzed.

1.2 Structure of the thesis

The thesis is structured in the following manner:

Chapter Two (Scoping review of patient-centered care approaches in healthcare). This chapter presents the methodology and results of the scoping review identifying the patient-centered care models and frameworks employed in healthcare today. This chapter will also discuss and compare the extracted approaches to patient-centered care and will conclude with a discussion on the study's implications to rehabilitation.

Chapter Three (Patient-centered care and orthopaedic health outcomes: A prospective cohort study analysis). This chapter presents the methodology and results of a prospective cohort study conducted to compare patient reported outcomes on patient-centeredness, pain, and function following distal radius fracture.

Chapter Four (Discussion and conclusions). This chapter will summarize the important findings of this thesis and will collate the findings from the two manuscripts included in this thesis. Implications for rehabilitation and areas for future research will also be discussed.

Chapter Two

SCOPING REVIEW OF PATIENT-CENTERED CARE APPROACHES IN HEALTHCARE

2.0 Introduction

Chapter two presents the manuscript entitled *Scoping review of patient-centered care approaches in healthcare*, which has been co-authored by Marissa Constand, Dr. Joy MacDermid, Dr. Vanina Dal Bello-Haas, and Dr. Mary Law. This manuscript will be submitted to *Disability and Rehabilitation* and has been formatted according to this journal's specifications.

2.1 Scoping review manuscript

BACKGROUND

Patient-centered care in healthcare is defined as care provision that is consistent with the values, needs, and desires of patients and is achieved when clinicians involve patients in healthcare discussions and decisions [1]. Patient-centered care is thought to have many benefits and has been proposed as a means of achieving better health outcomes, greater patient satisfaction, and reduced health costs [2]. For example, Cooper and colleagues [3] have identified that in a population of patients receiving physiotherapy for the treatment of chronic low back pain, the provision of patient-centered care helped the physiotherapists to “better understand and manage” their patient's needs. Furthermore, Cott [4] identified that an improved understanding of patient needs stems from clinicians acknowledging patient perspectives on recovery.

In a multi-site study conducted in primary care physician's offices servicing members of both urban and rural communities, Little et al [5] surveyed patient preferences for patient-centered care and suggested that the three main objectives of patient-centered care provision should include effective communication, partnership, and health promotion. Effective communication has been defined as the exploration of the patient's disease and illness to develop an understanding of the patient's healthcare experiences [1,2]. Developing a partnership with patients occurs when clinicians and patients find common ground upon which a healthcare plan can be developed mutually [1,2]. Finally, effective health promotion, defined in this study as tailoring healthcare plans based on reflections on the patient's past health history and current health context, helps ensure that healthcare plans are developed from an understanding of previous healthcare experiences. This approach reduces the risk of failed treatments and ensures optimal use of resources [1,2]. While these three components of patient-centered care have been identified as the elements that are most valued by patients receiving medical attention [5], the extent to which different patient-centered care frameworks and models embrace these three components as core elements, and their application across different disciplines has not been studied. Furthermore, Gzil et al [6] suggest that although

rehabilitation clinicians and scientists identify that patient-centered care is “the way forward for rehabilitation” [6], a consistent conceptual framework or model of patient-centered rehabilitation has yet to be accepted. We suggest that a reason for this stems from the breadth of practice and populations treated in the rehabilitation disciplines. The purpose of this study is to use scoping review methodology to determine the following with respect to patient-centered care frameworks and models:

1. What is the extent and nature of published scientific literature on patient-centered care frameworks and models including the research designs used, areas of clinical practice, and conceptualization of patient-centered care?
2. To what extent do the frameworks and models address the three core components of patient-centered care, effective communication, partnership, and health promotion?

A secondary purpose was to reflect on the depth of evidence surrounding a key component of patient-centered care, effective communication, by charting the published systematic reviews on effective communication practices. This review was conducted as a secondary review in order to identify evidence supporting patient-centered communication that may not be associated with a patient-centered framework or model. Effective communication is the most definable and consistent component of patient-centered care. Definitions for partnership and health promotion have been found to be less consistent in the literature depending on the clinical context. Therefore, we wanted to explore the extent of the empirical evidence supporting effective communication approaches in healthcare having accepted that effective communication is a key component of any patient-centered care approach.

METHODS

Search Strategy

Literature published in English between 1990 and 2012 was collected from three databases: Medline, CINAHL, and EMBASE. A key term search strategy was employed using the words “patient-centered care”, “client-centered care”, “framework” and “model.” The terms “framework” and “model” were selected to classify the approaches to patient-centered care provision because they provide standardized methods that can be easily followed and reproduced. A similar search was conducted for systematic reviews that included communication as a title word to identify the most easily accessible systematic reviews addressing communication.

Study Selection

Articles were eligible for inclusion in this review if they described a patient-centered care framework or model being applied to an adult population receiving healthcare. Only articles published since 1990 and written in English were eligible for inclusion in this review. Articles were excluded if they did not pertain to a patient-

centered care framework or model, or if did not address a healthcare context. Titles and abstracts of articles were independently reviewed by two authors (MKC and JCM). If articles were representative of the inclusion criteria, the articles went through two full-text independent reviews by two authors (MKC and JCM). If disagreements arose, a third party reviewer would be consulted.

Articles were included from the secondary review of the literature if they were systematic reviews identifying effective communication strategies in any healthcare discipline. Studies were excluded if they did not identify effective communication strategies between clinicians and patients or clinicians and their families.

Data Extraction and Reporting

If an article was eligible for inclusion in this study, data related to the patient-centered care framework or model presented in the article was extracted by the lead author and reviewed by a second author (JCM). Data extracted from the reviewed patient-centered care frameworks and models was summarized on the data-summary form. This form was used to identify the nature of articles and the articles' approaches towards achieving effective communication, partnership, and health promotion.

Information on the clinical context, patient-centered focus, number of studies reviewed, and key findings from the included systematic reviews on communication was recorded on a second data-summary form.

RESULTS

From an original hit total of 101 articles, 60 articles were excluded after reading the article title, and 22 articles were excluded after they were read fully (Figure 2-1).

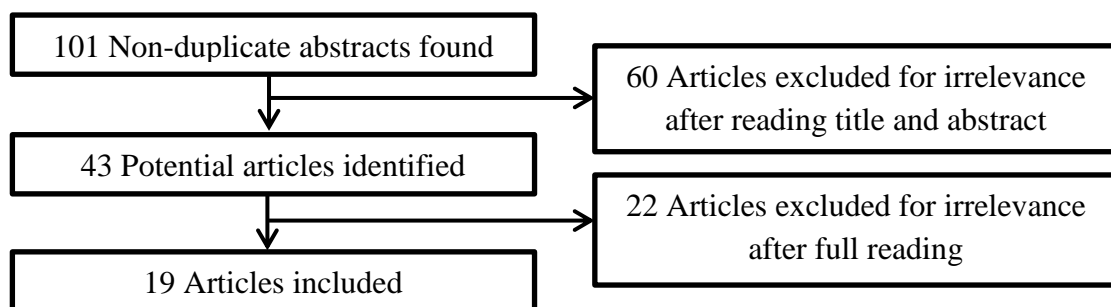


Figure 2-1: Scoping review process

Nineteen articles were selected for inclusion in this review. Twelve of these articles were narrative review articles. The remaining studies included four qualitative research papers, one randomized control trial, and one prospective study. Of the 19 included articles, 25 unique patient-centered care frameworks or models were identified (Table 2-1). The secondary review conducted on communication strategies yielded a hit total of 69 systematic review articles, 25 of which met inclusion criteria (Table 2-2).

Table 2-1: Data-charting form

Author	Article Type	Population	Patient-Centered Care Approach Identified
Ballweg ⁷ , 2001	Review article	Neonatal Intensive Care Unit	Developmentally Supportive, Family-Centered Care Model
Berger ⁸ , 2006	Review article	Psychiatry	The Tidal Model
Bickler ⁹ , 1994	Review article	Surgery	Patient-Focused Care Model
Boltz ¹⁰ , 2011	Review article	Geriatrics	Nurses Improving Care for Health System Elders
Booth & MacBride ¹¹ , 2007	Review article	Generic	Patient-Centered Clinical Method
Briggs ¹² , 2011	Review article	Palliative Care/ Physical Therapy/ End of Life Care	National Consensus Project for Quality Palliative Care Hypothesis Oriented Algorithm for Clinicians Framework for Rehabilitation of Neurodegenerative Diseases Framework for Assessment in Oncology Rehabilitation Models of Practice in Palliative Care
Browne et al ¹³ , 2003	Review article	Nursing	Decentralization
Cox ¹⁴ , 2011	Review article	Psychiatry	Biopsychosocial Model
deLusignan et al ¹⁵ , 2003	Review article	Nursing	Model for Patient-Centered Consultations with Nurses in Primary Care
DiGoia et al ¹⁶ , 2007	Prospective Study	Orthopedics	Patient and Family Centered Collaborative Care
Enguidanos et al ¹⁷ , 2005	Randomized control trial	Geriatrics/ Psychiatry	Integrated Depression Care Management Model

Author	Article Type	Population	Patient-Centered Care Approach Identified
Ford et al ¹⁸ , 2011	Review article	Nursing	RNAO Best Practice Guideline on Client Centered Care
Hantho et al ¹⁹ , 2002	Review article	General	Malterud`s Key Questions Stuart`s BATHE Model The Communication Model
Hatzichristou & Tsimsiou ²⁰ , 2005	Review article	Urology	Patient Centered Model for the Management of Sexual Dysfunction
Kelleher ²¹ , 2006	Review article	Intensive Care	The Synergy Model
Kibicho & Owczarzak ²² , 2012	Qualitative research	Pharmacy	Patient-Centered Pharmacy Services
McCormack ²³ , 2003	Qualitative research	Geriatrics	Authentic Consciousness
Rosvik et al ²⁴ , 2011	Qualitative research	Geriatrics	VIPS Practice Model
van der Eijk et al ²⁵ , 2011	Qualitative research	Neurology	Theoretical Model of Patient Centeredness for Parkinson's Disease

Table 2-2: Systematic reviews on communication in healthcare

Systematic Review	Clinical Context	PCC Focus	# Studies Reviewed	Key Findings
Beck, Daughtridge & Sloane ²⁹ , 2002	Primary Care	Yes	22	<ul style="list-style-type: none"> Physician behavior linked with positive patient outcomes, adherence, and patient satisfaction
Chan et al ³⁰ , 2012	Pre-operative Care	Yes	11	<ul style="list-style-type: none"> Sharing information, family involvement, autonomy, and professionalism are key Knowledgeable clinicians with positive attitudes enhance patient “journey”
Davis et al ³¹ , 2012	Oncology	Yes	21	<ul style="list-style-type: none"> Complementary and alternative medicine use in patients with cancer must be discussed using effective communication skills in order to avoid patients failing to disclose use with clinician
Edwards et al ³² , 2012	Genetics	Yes	28	<ul style="list-style-type: none"> Clinician provision of support and sharing emotion proven to be more beneficial to patients than sharing information
Edwards et al ³³ , 2008	Primary Care	Yes	96	<ul style="list-style-type: none"> Including patients in risk estimates during discussion between patients and clinicians regarding genetic screening results is productive
Egan et al ³⁴ , 2010	Alzheimer’s Disease	Not Clear	13	<ul style="list-style-type: none"> Employing memory aids and specific caregiver training programs enhances verbal communication, specifically information uptake with patients with Alzheimer’s Disease
Eggenberger, Heimerl & Bennett ³⁵ , 2013	Dementia	Yes	12	<ul style="list-style-type: none"> Enhancing communication skills of professionals working with dementia patients results in improvements of patient quality of life, positive interactions with peers, and organization of care
Fawole et al ³⁶ , 2013	Palliative Care	Yes	20	<ul style="list-style-type: none"> Improving palliative care communication with patients

Systematic Review	Clinical Context	PCC Focus	# Studies Reviewed	Key Findings
				includes improving healthcare utilization and patient/family consultations
Finke, Light & Kitko ³⁷ , 2008	Nursing	Not Clear	12	<ul style="list-style-type: none"> Improving communication between nurses and non-verbal patients is necessary to reduce patient frustration with ineffective communication strategies
Hancock et al ³⁸ , 2007	Palliative Care	Not Clear	51	<ul style="list-style-type: none"> Patients’ perceptions of shared information are inconsistent with healthcare professional’s perceptions of the information provided Healthcare professionals “underestimate” patient need for information and “overestimate” patient understanding of illness
Harrington, Noble & Newman ³⁹ , 2004	Primary Care	Yes	25	<ul style="list-style-type: none"> Improvements in perceptions of autonomy impacts information recall, adherence, attendance, and clinical outcomes following intervention studies aimed to augment patient participation in medical interactions
Henry et al ⁴⁰ , 2012	Primary Care	Yes	26	<ul style="list-style-type: none"> Increased patient satisfaction was correlated with positive/warm clinician interactions with active listening
Janssen & Largo-Janssen ⁴¹ , 2012	Gynecology	Yes	9	<ul style="list-style-type: none"> Patient-centered communication styles increase patient satisfaction
Laidsaar-Powell et al ⁴² , 2013	Primary Care	Yes	52	<ul style="list-style-type: none"> Triadic communication (patient-clinician-family member) involves: encouraging family involvement in care, re-enforcing positive family contributions, identifying roles

Systematic Review	Clinical Context	PCC Focus	# Studies Reviewed	Key Findings
				of patients and family members
Oliveira et al ⁴³ , 2012	Primary Care	Yes	27	<ul style="list-style-type: none"> • Communication indicating valuing patient autonomy is correlated with high patient satisfaction
Parker et al ⁴⁴ , 2007	Palliative Care	Not Clear	123	<ul style="list-style-type: none"> • At end-of-life, patients want less information sharing and caregivers want more information sharing • Patients value empathic and honest clinicians who encourage questions and facilitate discussions
Pinto et al ⁴⁵ , 2012	Rehabilitation	Yes	12	<ul style="list-style-type: none"> • The “therapeutic alliance” is enhanced by emotional support provision and patient participation during consultation
Rodin et al ⁴⁶ , 2009	Oncology	Yes	21	<ul style="list-style-type: none"> • Patients have varying communication needs and may prefer professional-centric communication over patient-centered communication, therefore clinicians are encouraged to individualize their communication styles to patient needs
Scheunemann et al ⁴⁷ , 2011	Intensive Care	Yes	2841	<ul style="list-style-type: none"> • Printed communication aids, structured communication from the healthcare team, and ethics consultations improve emotional outcomes for families in the ICU
Slort et al ⁴⁸ , 2011	Palliative Care	Yes	15	<ul style="list-style-type: none"> • Clinician availability and openness to facilitating discussions about end-of-life care, including reflection on poor outcomes, facilitates patient-clinician communication
Tay, Hegney & Ang ⁴⁹ , 2011	Nursing	Not Clear	8	<ul style="list-style-type: none"> • While patient and clinician characteristics are found to influence communication, the

Systematic Review	Clinical Context	PCC Focus	# Studies Reviewed	Key Findings
				role of the environment in effective communication between these two parties is not well documented <ul style="list-style-type: none"> • Reception to patient cues and effective information sharing builds relationships with patients and maintains open communication
Thompson & McCabe ⁵⁰ , 2012	Psychiatry	Not Clear	23	<ul style="list-style-type: none"> • A strong clinician-patient relationship that involves effective communication is correlated with adherence • Clinicians wishing to promote patient-clinician collaboration must attempt to find common ground with patients and share decision making roles
Uitterhoeve et al ⁵¹ , 2010	Oncology	Not Clear	7	<ul style="list-style-type: none"> • No correlation was found between effective communication training and patient distress outcomes
Vasse et al ⁵² , 2010	Dementia	Not Clear	19	<ul style="list-style-type: none"> • Improving communication with patients with dementia can improve daily care activities and intervention outcomes; however, has little impact on neuropsychiatric symptoms
Wanyonyi & Themessl-Huber ⁵³ , 2011	Primary Care	Yes	6	<ul style="list-style-type: none"> • Clinicians should allocate time to “discover their patients’ psycho-social characteristics” in order to achieve health promotion

ANALYSIS

Content analysis of all patient-centered care frameworks and models included in this review revealed that all frameworks and models included approaches to achieving the three essential components of patient-centered care: effective communication, partnership, and health promotion (Table 2-3).

Table 2-3: Data summary form

Article	Communication		Compassion/ Empathy/Empowerment	Sensitivity to Needs	Partnership		Health Promotion	
	Sharing Information	x			Relationship Building	Collaboration	Case Management	Resource Use
Ballweg ⁷ , 2001				x			x	x
Berger ⁸ , 2006								x
Bickler ⁹ , 1994				x	x			x
Boltz ¹⁰ , 2011			x		x		x	x
Booth & MacBride ¹¹ , 2007			x	x	x			x
Briggs ¹² , 2011			x	x	x			x
Browne et al ¹³ , 2003		x	x				x	x
Cox ¹⁴ , 2011				x				
deLusignan et al ¹⁵ , 2003			x				x	x
D'Goia et al ¹⁶ , 2007			x		x			
Enguidanos et al ¹⁷ , 2005			x	x				x
Ford et al ¹⁸ , 2011								
Hantho et al ¹⁹ , 2002			x					
Hatzichristou & Tsimtsiou ²⁰ , 2005			x	x		x		x
Kelleher ²¹ , 2006								
Kibicho & Owczarzak ²² , 2012								
McCormack ²³ , 2003		x					x	
Rosvik et al ²⁴ , 2011							x	
van der Eijk et al ²⁵ , 2011				x			x	
Total	17/19		10/19	11/19	14/19	15/19	15/19	9/19
Incorporates category								
Does not incorporate category	x							

Communication

Three components of communication were commonly discussed in the articles reviewed: a) sharing information, b) compassionate and empowering care provision, and c) sensitivity to patient needs.

Sharing Information

Creation of an effective learning environment was cited as a method for supporting patient-centered care in 89.5% of articles reviewed. Many articles discussed effective communication of healthcare information from the clinician to the patient, but also included approaches to effective patient information uptake by the clinician. Effective information uptake was seen as being an essential step in tailoring information to suit patient needs, vulnerabilities, and capacities [11,12]. Active listening, asking open ended questions, and developing functional goals were strategies cited by review articles to achieve effective information uptake [11,12,15].

Compassionate and Empowering Care Provision

Providing compassionate and empowering care was cited as a component of achieving effective communication in 53% of articles reviewed. Such care is described as being attentive and altruistic, and was emphasized by several review articles and by the sole randomized control trial included in this review [14,16]. As well, these articles described compassionate and empowering care as contributing to the development of a strong clinician-patient relationship based upon patient feelings of autonomy and trust [14,16].

Sensitivity to Patient Needs

Strategies on how to be sensitive to patient needs were primarily discussed in the qualitative research articles included in this review. Such strategies included acknowledging and adapting to unique patient identifiers [19,25]. For example, clinicians are urged to observe and reflect on fluctuating levels of patient alertness, patient comfort levels in the presence or absence of family members, and different communication barriers such as hearing loss, in order to facilitate clinical interactions [15,19,22]. Of the articles reviewed, 58% identified that careful observation of unique patient characteristics is necessary to providing care that will lead to optimal patient receptiveness and positive health outcomes.

Partnership

Two components of partnership development were commonly discussed in the articles reviewed: a) relationship building and b) inter-professional collaboration.

Relationship Building

Relationship building was discussed by all article types included in this review. Of the articles reviewed, 74% identified that building relationships with patients and families contributes to understanding what problems the patient is most concerned with and how their illness or injury has affected their life [15,18,23]. The involvement of patients and families in their care builds trust and encourages mutual problem solving [17].

Inter-professional Collaboration

Engaging in inter-professional collaboration to decentralize health care provision was cited as a method of achieving partnership among healthcare professionals in 79% of the articles reviewed. These articles were primarily review articles that described decentralization as a team-based approach to care provision that contributed to efficient and focused care provision [7-10,13,21].

Health Promotion

Achieving health promotion in a patient-centered context requires reflection on how to best support optimal health and care provision through reflection on the patient's history. The two components of health promotion that were commonly discussed in the articles reviewed as being effective ways to achieve patient-centered care were a) effective case management and b) efficient use of resources.

Effective Case Management

Effective case management was identified by 79% of articles reviewed as being a necessary component of health promotion. Effective case management involves the evaluation of past successes and failures of care in order to best tailor future health initiatives and reduce risk of adverse health outcomes [26]. This process is facilitated by discussions with patients about previous healthcare experiences in order to develop an understanding of how patients respond to certain types of care, such as care requiring follow-up appointments or self-directed home exercises [17,19,20].

Efficient Use of Resources

Appropriate organization of resources around patients was cited by 47% of articles included in this review as a way to achieve health promotion. By using resources that best suit patient needs and values, clinicians can tailor treatment plans to best represent how patients are likely to respond to certain interventions [16].

Secondary Review Analysis of Communication Strategies

The secondary review of systematic review articles on communication strategies in healthcare revealed that the majority of articles (68%) explicitly related communication

strategies to patient-centered care. Articles that did not explicitly state this relationship through the use of the terms “patient-centered” or “client-centered” care, implied this relationship by identifying how effective communication between patients and healthcare professionals impacts patient satisfaction and health outcomes. The breadth of disciplines from which this literature was found is consistent with the diverse nature of the literature found on patient-centered care frameworks and models. Exploration of key findings revealed that effective communication strategies surrounding information provision and uptake by the healthcare professional, as well as respect for patient autonomy were the main facilitators of a positive clinical interaction.

DISCUSSION

This scoping review provides an overview of how patient-centered care is conceptualized in the current literature and suggests that the three components of patient-centered care valued by patients are predominantly featured in patient-centered care models and frameworks across different settings, populations, and applications. These core components were approaches to achieving effective communication, partnership and health promotion. While some of the articles reviewed pertained to specific target populations, the frameworks and models that they described were based on similar components of patient-centered care provision. This suggests that the models can be broadly applied. These components were clearly defined by authors, which made common approaches to communication, partnership, and health promotion easily identifiable during the progression of this scoping review’s analysis.

Epstein et al [26] identify that while patient-centered care is acknowledged by clinicians as an ideal approach to care provision, “what it is and how to measure it” [26] is not clear to clinicians. They suggest that additional research is needed to strengthen the evidence supporting patient-centered care in healthcare [26]. This scoping review provides a foundation for future research by collating and summarizing the theoretical and empirical evidence regarding effective approaches to achieving patient-centered care provision. There is clearly a need for greater emphasis on empirical testing of the health and system impacts of providing patient-centered care in different contexts since the literature reviewed primarily addressed this topic theoretically, and only one randomized control trial was identified. Despite this finding, the consensus around inclusion of communication, partnership, and health promotion, across frameworks identified through this scoping review provides preliminary guidance to clinicians that these key features of patient-centered care should be specifically addressed.

The use of theoretical foundations is considered important in rehabilitation, but how theory is operationalized within the area of patient-centered care is more conceptual than empirical, as indicated by the fact that only one randomized control trial was identified. This is consistent with findings of how theory has been applied to knowledge translation within rehabilitation. Colquhoun et al [27] found theoretical frameworks were more commonly used in a generic way rather than as a specific operational tool for

defining interventions, processes, expected outcomes or evaluation strategies. Charting the nature of the evidence with respect to the use of patient-centered care frameworks and models suggests a greater need for empirical studies that test the value of providing patient-centered care versus alternatives in a rehabilitation context.

Having found consensus that communication, partnership and health promotion are key aspects to providing patient-centered care, it is important to have rigorous definitions and clear descriptions of what these processes entail, as well as evidence about how to operationally optimize these elements in different contexts and with different patient populations. Health promotion and partnership have been defined a specific way in the patient-centered care literature. How these are defined in other aspects of care, may differ. For example, health promotion has been defined by the World Health Organization as "the process of enabling people to increase control over their health and its determinants, and thereby improve their health" [28]. However, within the patient-centered care literature it has been defined as developing healthcare plans based on reflection on patient histories for the purposes of health enhancement, risk reduction, and early detection of illness [5]. For this reason, it could be challenging for clinicians to identify empirical evidence regarding the extent to which health promotion and partnership activities contribute to better outcomes with patient-centered care. However, literature addressing communication and empirical studies on this topic is more easily defined. For this reason, we looked at readily identifiable systematic reviews that included communication in their title since this reflects the easily accessible, yet high quality, empirical evidence supporting this aspect of patient-centered care. From these studies, we were able to determine that the majority of articles published on effective communication strategies in healthcare have a patient-centered focus and it is important to operationalize this focus in order to implement such strategies.

CONCLUSION

While no unifying rehabilitation-specific framework or model for patient-centered care was found, a consensus among frameworks and models of different disciplines around the important components of patient-centered care was observed. This consensus suggests that the development of a rehabilitation-specific patient-centered care framework or model is possible. Given the breadth and diversity of rehabilitation contexts, such a universal model would need to have sufficient flexibility to be operationalized across different settings. The results from this scoping review might contribute to the preliminary discussions surrounding the development of a universal rehabilitation patient-centered care framework and could form the foundation for agreement on terminology, definition of components, and future research. Studies that attest to the implementation and empirical evaluation of the outcomes of patient-centered care are needed and should include at minimum the three tenets of patient-centered care: communication, partnership, and health promotion.

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2.2 Implications for this thesis

This study developed an understanding of the approaches currently employed by clinicians to achieve patient-centered care, and answered the first research question of this thesis. With this knowledge, we now understand what models and frameworks are currently being used to inform clinicians how to apply patient-centered care in practice. In order to understand the effectiveness of this care, we must understand patient-perspectives on these practical applications of patient-centered care. Therefore, this thesis will progress logically to exploring patient-perspectives of patient-centeredness through a prospective cohort study.

Chapter Three

PATIENT-CENTERED CARE AND ORTHOPAEDIC HEALTH OUTCOMES: A PROSPECTIVE COHORT STUDY ANALYSIS

3.0 Introduction

Chapter two presents the manuscript entitled *Patient-centered care and orthopaedic health outcomes: A prospective cohort study analysis*, which has been co-authored by Marissa Constand, Dr. Joy MacDermid, Dr. Vanina Dal Bello-Haas, and Dr. Mary Law. This manuscript will be submitted to *The Journal of Orthopaedic Trauma* and has been formatted according to this journal's specifications.

3.1 Prospective Cohort Study Manuscript

Introduction

In recent years, researchers and clinicians have developed an appreciation for including patients as active participants in their healthcare. The biomedical approach to healthcare provision that was once so prevalent has been challenged by developments such as the International Classification of Functioning, Disability, and Health, the consumer disability movement, the Patient-Centered Clinical Method; and, two behaviour theories, Self-Determination Theory and Self-Regulation Theory.^{1,2,3,4} A patient-centered clinical interaction involves clinicians taking into consideration their patient's values, perspectives, and desires when mutually developing a healthcare plan.² This approach to healthcare provision involves clinicians employing their experience and expertise to develop a healthcare plan *with* the patient rather than *for* the patient.²

Involving patients in their own healthcare fosters feelings of autonomy and trust, which ultimately contributes to patient motivation to achieve their healthcare goals.^{2,5} Research has revealed that patient-centered clinical interaction can produce positive patient healthcare outcomes in primary care and rehabilitation settings.^{6,7} However, it is hypothesized that clinicians working in different disciplines within healthcare and rehabilitation may have different perspectives on how beneficial a patient-centered clinical interaction is for their patient due to the nature of their injury. For example, while a patient who presents with a distal radius fracture will ultimately benefit from patient-centered rehabilitation, having a patient-centered clinical interaction with the surgeon who will be performing emergency surgery to repair their wrist may not be as important. Understanding the role of patient-centered care in orthopaedic clinical interactions is an objective of this study that would provide an understanding of patient needs surrounding acute orthopaedic injury.

The purpose of this study is to explore the relationship between patient-centered care provision and health outcomes in an orthopaedic setting. This objective will be achieved by examining patient perspectives on the patient-centeredness of their care

following a distal radius fracture, and relating these perspectives to patient recoveries. This study will answer the following research questions with respect to the early treatment of people post-distal radius fracture:

- 1) Do the items belonging to the subscales of the Patient Perception of Patient-Centeredness Questionnaire (PPPC) proposed by Stewart et al.⁸ demonstrate some factors that are consistent with the factor analyzed data set?
- 2) What areas of patient-centered care are strongest and weakest from the perspective of the distal radius fracture patient?
- 3) Do patient perceptions of patient-centered care change during the initial three months of post-distal radius fracture treatment?
- 4) Do aspects of patient-centered care correlate with patient reported pain and disability?

Methods

Participants

Participants were enrolled in a prospective cohort study at The Hand and Upper Limb Centre at Western University in London, Ontario, Canada. Inclusion criteria included having a distal radius fracture and being able to participate in the study within 10 days of fracture. Exclusion criteria included patients who had comorbid health problems that prevented participation, who were unable to return for follow-up, or who were unable to complete self-report measures for reasons of literacy, physical or mental impairments. Initial data collection took place between May 2004-September 2008. The cohort study received ethics approval from the Health Sciences Research Ethics Board of the University of Western Ontario. Data recorded for 129 patients post-distal radius fracture were analyzed in this study. A follow-up time frame of three months was selected because it would allow sufficient time for follow-up interactions between the patient and the clinician as well as time for distal radius fracture recovery.⁹

Outcome Measures

Patients completed demographic information and two self-report questionnaires: The Patient Rated Wrist Evaluation (PRWE) and The Patient Perception of Patient-Centeredness Questionnaire (PPPC). The PRWE is a 15-item self-report questionnaire that asks patients to evaluate their wrist pain and function. The PRWE consists of two subscales measuring pain and function. The pain subscale consists of five items that ask patients to rate their pain on a 10-point ordinal scale. A higher score represents a state of extreme pain and a score of 0 represents a state of no pain. The function subscale consists of six items relating to patient functioning during *specific* activities such as turning a door knob using the affected hand, and four items relating to patient functioning during *usual* activities such as personal care. The function subscale items ask patients to rate their ability to function on a 10-point ordinal scale. A higher score represents greater inability to function. The PRWE has been found to be a reliable and valid measurement tool for the evaluation of patient pain and functioning following distal radius fracture.¹⁰

The PPPC is a self-report questionnaire that asks patients to evaluate their perceptions of patient-centeredness. The PPPC consists of 14-items in total, 13 of which are categorized into two subscales. The described subscales within the PPPC do not have given names. Subscale 1 consists of Items 1-4 which relate to how patient illness experiences have been explored.⁸ Subscale 2 consists of Items 5-13 relates to how well clinicians and patients were able to find common ground.⁸ Scores for all sub-scales are totaled during analysis. The final item of the PPPC, Item 14, relates to patient perceptions of how the clinician attempted to understand him/her as a whole person.⁸ For the purposes of this study and based on the aforementioned subscale categorizations as proposed by the measure's authors, Subscale 1 will be referred to as *Communication* and Subscale 2 will be referred to as *Partnership*. As well, short form titles for all PPPC items were developed by this study's authors in order to facilitate reporting of results (Table 3-1). Patients are asked to rate their responses to PPPC items on a four point ordinal scale with response options resembling variations of the following: "completely", "mostly", "a little", or "not at all." These response options reflect the degree of patient-centeredness patients have experienced and are assigned numerical codes during analysis. Positive patient perspectives are coded with lower numerical values (1-2), and poorer perceptions of patient-centeredness are coded with higher numerical values (3-4). The PPPC has been proven to be a reliable and valid measurement tool for the evaluation of patient perceptions of their care.⁸ The PPPC has been shown to detect differences in patient-centeredness of care in populations with one or more recurring health issues, such as respiratory and musculoskeletal health issues, and in those seeking care from family physicians.⁸ Factor analysis of the PPPC has not been previously reported for orthopaedic populations.

Table 3-1: PPPC item short form legend

PPPC Subscale	PPPC Item (Stewart et al., 2003)	Short Form*
Subscale 1	1. To what extent was your main problem(s) discussed today?	Main Problem Discussed
	2. Would you say that your doctor knows that this was one of your reasons for coming in today?	Healthcare provider (HCP) Aware of Reason for Visit
	3. To what extent did the doctor understand the importance of your reason for coming in today?	Healthcare provider (HCP) Understands Importance of Visit
	4. How well do you think your doctor understood you today?	Felt Understood
	Subscore	Communication
Subscale 2	5. How satisfied were you with the discussion of your problem?	Satisfaction Problem Discussion
	6. To what extent did the doctor explain this problem to you?	Doctor Explanation
	7. To what extent did you agree with the doctor's opinion about the problem?	Opinion Agreement
	8. How much opportunity did you have to ask your questions?	Chance to Ask Questions
	9. To what extent did the doctor ask about your goals for treatment?	Asked About Goals
	10. To what extent did the doctor explain treatment?	Explained Treatment
	11. To what extent did the doctor explore how manageable this (treatment) would be for you?	Explored Management
	12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)	Discuss Roles
	13. To what extent did the doctor encourage you to take the role you wanted in your own care?	Empowerment
	14. How much would you say that this doctor cares about you as a person?	Care for Person
	Subscore	Partnership
Total PPPC Score		

*All short forms were developed by the authors of this paper so as to facilitate reporting of results

Statistical Process

STATA 12.1 was employed for all analyses. Descriptive statistics were obtained for items and subscale scores of both outcome measures. Variables were explored for normality using the Shapiro-Wilk Test prior to testing, and imputation with the mean was employed to determine follow-up data for three participants.¹¹ The statistical process was as follows:

1) Factor Analysis

Factor analysis was conducted for reported patient responses at baseline and at three months post injury using principal component analysis with varimax orthogonal rotation. This factor analysis was conducted to investigate if the extracted loading patterns of collected PPPC item responses were consistent with the following two factor categorizations proposed by Stewart et al.⁸: Factor 1 (Items 1-4) and Factor 2 (Items 5-13). Since factor analysis revealed inconsistencies between extracted and proposed loadings, correlation analysis of PPPC and PRWE subscales was pursued using the subscales that emerged from the factor analysis instead of the proposed subscales.

2) Patient Perspectives on Patient-Centeredness

To determine which areas of patient-centered care patients perceived to be strongest and weakest, we ranked items according to mean scores at baseline and at three months post injury.

3) Changes in Patient Perspectives Over Time

Changes in perceptions of patient-centeredness were determined by a Wilcoxon Rank Sum test for the ordinal data responses to each PPPC item, and by a t-test when comparing total scores.

4) Patient-Centeredness and Health Outcomes Correlation

The relationship between patient-centeredness of care and recovery, which was defined as reduction in pain and improvement in functioning, was determined by correlating the initial and three-month PPPC subscale and total score responses with PRWE pain and function scores using a Pearson's correlation coefficient. The PPPC subscales employed in this analysis were those that emerged from this study's factor analysis and not those proposed by Dr. Stewart and colleagues.

Results

Patients included in the sample were primarily female (68.2%) who had received surgery for distal radius fracture repair. The mean age was 54.03 (SD=14.63; Range = 18-81) (Table 3-2).

Table 3-2: Sample demographics

Demographic	Statistic
Age	Mean age= 54.03 ,Standard Deviation= 14.63, Range = 18-81
Sex	68.2% Female 31.8% Male
Hand injured	46.5% Dominant 53.5% Non-dominant
Mechanism of fracture	23% Fall on ice or snow 54% Other fall 19% Other 3% No response
Care received	22% No surgery 78% Surgery

Factor Analysis

The factor analysis conducted on baseline responses to the 14 PPPC items revealed a significant response to Bartlett’s test of sphericity ($\chi^2(91) = 1110.50, p < 0.001$) indicating suitability for factor analysis. Initial eigen values showed that the first factor explained 79% of the variance, the second factor explained 18% of the variance, and the third factor explained 5% of the variance. All items had primary loadings over 0.3 with the most significant factors loading sufficiently high (between 0.45-0.85) (Norman & Streiner, 2008). Three items experienced cross-loading, which was acknowledged when the difference between factor loadings was less than 0.2. The factor labels proposed by Stewart et al. (2000) for Subscale 1 suited the extracted factors, as PPPC Items 1-4 (Main Problem Discussed, HCP Aware of Reason for Visit, HCP Understands Importance of Visit, and Felt Understood) loaded on Factor 1. The factor labels proposed for the Subscale 2 (Items 5-13) were inconsistent with the extracted factors. Items 5-8 (Satisfaction Problem Discussion, Doctor Explanation, Opinion Agreement, Chance to Ask Questions) loaded on Factor 1. Items 9-11 (Asked About Goals, Explained Treatment, Explore Management) experienced cross loading on Factors 1-3, and Items 12 (Discuss Roles) and 13 (Empowerment) loaded on Factor 2. Factor 14 (Care for Person) experienced cross loading on Factors 1-3. (Table 3-3)

Table 3-3: Factor loadings based on a principle components analysis with varimax rotation for 14 PPPC items measured at baseline (N=129)*

PPPC Subscale	PPPC item	Factor 1	Factor 2	Factor 3	Communality
Subscale 1: “Patient perception that their illness experience has been explored”/ Communication	1. To what extent was your main problem(s) discussed today?	0.52	0.07	0.21	0.47
	2. Would you say that your doctor knows that this was one of your reasons for coming in today?	0.39	0.02	0.49	0.40
	3. To what extent did the doctor understand the importance of your reason for coming in today?	0.65	0.12	0.01	0.57
	4. How well do you think your doctor understood you today?	0.83	0.19	0.10	0.74
Subscale 2: “Patient perception that the patient and doctor had found common ground”/ Partnership	5. How satisfied were you with the discussion of your problem?	0.82	0.25	0.25	0.81
	6. To what extent did the doctor explain this problem to you?	0.75	0.20	0.32	0.74
	7. To what extent did you agree with the doctor’s opinion about the problem?	0.72	0.11	0.17	0.61
	8. How much opportunity did you have to ask your questions?	0.57	0.23	0.39	0.60
	9. To what extent did the doctor ask about your goals for treatment?	0.19	0.43	0.54	0.56
	10. To what extent did the doctor explain treatment?	0.46	0.35	0.60	0.70
	11. To what extent did the doctor explore how	0.26	0.51	0.60	0.71

PPPC Subscale	PPPC item	Factor 1	Factor 2	Factor 3	Communality
	manageable this (treatment) would be for you?				
	12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)	0.15	0.82	0.22	0.76
	13. To what extent did the doctor encourage you to take the role you wanted in your own care?	0.19	0.82	0.15	0.73
N/A	14. How much would you say that this doctor cares about you as a person?	0.42	0.40	0.46	0.56

*Bolded values = primary loading

The factor analysis conducted on follow up responses to the 14 PPPC items revealed a significant response to Bartlett’s test of sphericity ($\chi^2(91) = 1367.47$, $p < 0.001$). Initial eigen values showed that the first factor explained 81% of the variance, the second factor explained 13% of the variance, and the third factor explained 5% of the variance. All items had primary loadings over 0.30, and two items experienced cross loading. Subscale 1’s extracted loading patterns were inconsistent with proposed loading patterns as Item 1 (Main Problem Discussed) loaded on Factor 1, Items 2-3 (HCP Aware of Reason for Visit, HCP Understands Importance of Visit) loaded on Factor 3, and Item 4 (Felt Understood) loaded on Factors 1 and 3. Subscale 2’s extracted factor loading patterns were less scattered than Subscale 1’s items; however, Subscale 2’s loading patterns were still inconsistent with the proposed loading patterns. Items 5-8 (Satisfaction Problem Discussed, Doctor Explanation, Opinion Agreement, Chance to Ask Questions) loaded on Factor 1 and Items 9-13 (Asked About Goals, Explained Treatment, Explore Management, Discuss Roles, (Empowerment) loaded on Factor 2. Item 14 (Care for Person) experienced cross loading on Factors 1 and 2. (Table 3-4)

Table 3-4: Factor loadings based on a principle components analysis with varimax rotation for 14 PPPC items measured at three months post injury (N=129)*

PPPC Subscale	PPPC item	Factor 1	Factor 2	Factor 3	Communality
Subscale 1: “Patient perception that their illness experience has been explored”/ Communication	1. To what extent was your main problem(s) discussed today?	0.55	0.34	0.10	0.66
	2. Would you say that your doctor knows that this was one of your reasons for coming in today?	0.35	0.19	0.55	0.51
	3. To what extent did the doctor understand the importance of your reason for coming in today?	0.43	0.19	0.66	0.68
	4. How well do you think your doctor understood you today?	0.60	0.25	0.47	0.72
Subscale 2: “Patient perception that the patient and doctor had found common ground”/ Partnership	5. How satisfied were you with the discussion of your problem?	0.83	0.31	0.22	0.86
	6. To what extent did the doctor explain this problem to you?	0.69	0.36	0.34	0.80
	7. To what extent did you agree with the doctor’s opinion about the problem?	0.72	0.29	0.30	0.70
	8. How much opportunity did you have to ask your questions?	0.62	0.35	0.16	0.66
	9. To what extent did the doctor ask about your goals for treatment?	0.30	0.74	0.02	0.69
	10. To what extent did the doctor explain treatment?	0.45	0.67	0.19	0.78

	11. To what extent did the doctor explore how manageable this (treatment) would be for you?	0.40	0.74	0.13	0.80
	12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)	0.17	0.85	0.13	0.80
	13. To what extent did the doctor encourage you to take the role you wanted in your own care?	0.20	0.79	0.23	0.78
N/A	14. How much would you say that this doctor cares about you as a person?	0.47	0.32	0.06	0.49

*Bolded values = primary loading

The results from Table 3-3 and 3-4 indicate that the PPPC subscales proposed by the measure’s authors are not consistent with the subscales that emerged from the factor analysis. Acknowledging that the PPPC was initially developed for use in family practice, it is understandable that PPPC responses from populations with acute orthopaedic injury would demonstrate different factor loadings. The subscales that emerged from this factor analysis are: a) Subscale 1: Items 1-8 and b) Subscale 2: Items 9-13. Reference to these two new subscales will be made when attempting to correlate PPPC responses from patients with distal radius fractures with their respective PRWE responses. To facilitate this process, and to differentiate the new proposed subscales from Dr. Stewart’s proposed subscales, the new subscales will be referred to as follows: Subscale 1- *Clinician-Patient Dialogue* and Subscale 2- *Clinician-Patient Alliance*.

Patient Perspectives on Patient-Centeredness

The most positively responded to PPPC item at baseline and at three months post injury was PPPC Item 3, asking patients to rank their perceptions on how their doctor understood the importance of their visit, followed by PPPC Item 2, asking patients to rank their perceptions on how they would say that their doctor knew their reasons for their visit

(Tables 3-5 and 3-6). PPPC Items 9, 12, and 13 were rated the lowest by patients at baseline and at three months post injury. These items belong to the PPPC partnership subscale and asked patients to reflect on the extent to which their doctor explored their goals for treatment (Item 9), encouraged them to participate in their care (Item 12), and discussed specific clinician and patient roles (Item 13) (Tables 3-5, 3-6, 3-7). While some minor shifting was observed between a few items, the best and worst ranked items at baseline were similar at three months post injury.

Table 3-5: Ranked mean baseline PPPC scores

Ranking	PPPC Questionnaire Item	Mean Score (Standard Deviation); Range*
1- Most Positive	3. To what extent did the doctor understand the importance of your reason for coming in today?	1.16 (0.53)
2	2. Would you say that your doctor knows that this was one of your reasons for coming in today?	1.25 (0.71)
3	7. To what extent did you agree with the doctor’s opinion about the problem?	1.36 (0.66)
4	4. How well do you think your doctor understood you today?	1.37 (0.63)
5	6. To what extent did the doctor explain this problem to you?	1.42 (0.67)
6	1. To what extent was your main problem(s) discussed today?	1.45 (0.75)
7	5. How satisfied were you with the discussion of your problem?	1.48 (0.70)
8	8. How much opportunity did you have to ask your questions?	1.67 (0.76)
9	10. To what extent did the doctor explain treatment?	1.77 (0.88)
10	14. How much would you say that this doctor cares about you as a person?	1.77 (0.82)
11	11. To what extent did the doctor explore how manageable this (treatment) would be for you?	1.92 (1.13)
12	9. To what extent did the doctor ask about your goals for treatment?	2.15 (1.17)
13	13. To what extent did the doctor encourage you to take the role you wanted in your own care?	2.23 (1.31)
14 – Most Negative	12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)	2.43 (1.33)

*Possible Responses: 1- Completely to 4 – Not at all; Range = 1-4 for all responses

Table 3-6: Ranked mean three month post injury PPPC scores

Ranking	PPPC Questionnaire Item	Mean Score (Standard Deviation); Range*
1 – Most Positive	3. To what extent did the doctor understand the importance of your reason for coming in today?	1.16 (0.51)
2	2. Would you say that your doctor knows that this was one of your reasons for coming in today?	1.29 (0.73)
3	4. How well do you think your doctor understood you today?	1.37 (0.65)
4	6. To what extent did the doctor explain this problem to you?	1.37 (0.73)
5	7. To what extent did you agree with the doctor’s opinion about the problem?	1.38 (0.64)
6	1. To what extent was your main problem(s) discussed today?	1.47 (0.71)
7	5. How satisfied were you with the discussion of your problem?	1.48 (0.68)
8	8. How much opportunity did you have to ask your questions?	1.57 (0.73)
9	14. How much would you say that this doctor cares about you as a person?	1.58 (0.92)
10	10. To what extent did the doctor explain treatment?	1.66 (0.91)
11	11. To what extent did the doctor explore how manageable this (treatment) would be for you?	1.67 (0.99)
12	13. To what extent did the doctor encourage you to take the role you wanted in your own care?	1.72 (1.12)
13	9. To what extent did the doctor ask about your goals for treatment?	1.96 (1.05)
14 – Most Negative	12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)	2.03 (1.25)

***Possible Responses:** 1- Completely to 4 – Not at all; **Range** = 1-4 for all responses

Table 3-7: PRWE mean scores

PRWE score	Baseline Mean Score; Standard Deviation(Range)	Follow Up Mean Score; Standard Deviation(Range)
Pain sub-score	18.38; 16.29 (0-50)	15.88; 11.51 (0-47)
Specific function sub-score	44.19; 20.32 (0-60)	18.38; 16.62 (0-60)
Usual function sub-score	23.00; 13.63 (0-40)	10.59; 9.67 (0-40)
Total PRWE score	57.55; 24.45 (0-100)	31.61; 22.42 (0-95)

Changes in Patient Perspectives Over Time

The Wilcoxon Rank Sum test revealed that patient responses to PPPC Items 12, 13, and 14 were found to significantly improve when measured at three months post injury compared to baseline responses (Table 3-8). This observation marks an improvement of patient perspectives of their care with respect to: a) determining clinician and patient roles (Item 12); b) role assumption (Item 13); and, c) clinicians caring about the patient as a whole person (Item 14). No significant changes were observed over time for the total score.

Table 3-8: Changes in PPPC scores over time

PPPC	Baseline score	Follow up score	P value
Changed Items			
12. To what extent did you and the doctor discuss your respective roles? (Who is responsible for making decisions and who is responsible for what aspects of your care?)	2.43	2.03	0.02
13. To what extent did the doctor encourage you to take the role you wanted in your own care?	2.23	1.72	0.00
14. How much would you say that this doctor cares about you as a person?	1.77	1.58	0.04
Unchanged Items			
1. To what extent was your main problem(s) discussed today?	1.46	1.47	0.64
2. Would you say that your doctor knows that this was one of your reasons for coming in today?	1.25	1.29	0.42
4. To what extent did the doctor understand the importance of your reason for coming in today?	1.16	1.16	0.76
5. How well do you think your doctor understood you today?	1.37	1.37	0.92
6. How satisfied were you with the discussion of your problem?	1.48	1.48	0.88
7. To what extent did the doctor explain this problem to you?	1.42	1.37	0.33
8. To what extent did you agree with the doctor's opinion about the problem?	1.36	1.38	0.64
9. How much opportunity did you have to ask your questions?	1.67	1.57	0.24
10. To what extent did the doctor ask about your goals for treatment?	2.14	1.96	0.16

PPPC	Baseline score	Follow up score	P value
11. To what extent did the doctor explain treatment?	1.77	1.66	0.22
12. To what extent did the doctor explore how manageable this (treatment) would be for you?	1.92	1.67	0.06
PPPC Total Score	23.61	21.76	0.09

Patient-Centeredness and Health Outcomes Correlation

While a statistically significant correlation was observed at baseline and at three months post injury between the total scores of the PPPC and the PRWE, the correlation is not very strong. These results indicate that positive patient perspectives of patient-centeredness as measured by the PPPC are significantly correlated with reduction in pain and improvements in functioning in patients recovering from distal radius fracture; however, the clinical significance of these correlations is questionable. (Table 3-9)

1. Patient Centered-Care and Pain Reduction

No significant correlations were observed between the PPPC subscales emerging from the factor analysis and PRWE pain scores at baseline (Table 3-9). A highly significant correlation was found between first subscale that emerged from the factor analysis (Clinician-Patient Dialogue) and PRWE pain scores at follow up (Table 3-10).

2. Patient-Centered Care and Functional Recovery

The only significant correlation found between the subscales of the PPPC that emerged from the factor analysis and PRWE function subscales at baseline was between the PPPC Subscale 2 (Clinician-Patient Alliance) and the specific function subscale (Table 3-10). At follow up, significant correlations were found between Clinician-Patient Dialogue, the first subscale that emerged from the factor analysis, and specific and usual function subscales (Table 3-10).

Table 3-9: Baseline PPPC and PRWE correlations

PPPC Scores	Pain subscale (ρ)	Specific function subscale (ρ)	Usual function subscale (ρ)	Total PRWE score (ρ)
Subscale 1: Clinician-Patient Dialogue	-0.00	0.04	0.01	
Subscale 2: Clinician-Patient Alliance	0.17	0.22*	0.11	
Total Score				0.17*

* p<0.05 **p<0.01 ***p<0.001

Table 3-10: Follow up PPPC and PRWE correlations

PPPC Scores	Pain subscale (ρ)	Specific function subscale (ρ)	Usual function subscale (ρ)	Total PRWE score (ρ)
Subscale 1: Clinician-Patient Dialogue	0.31***	0.20*	0.19*	
Subscale 2: Clinician-Patient Alliance	0.12	0.10	0.14	
Total Score				0.21*

* p<0.05 **p<0.01 ***p<0.001

Discussion

Aspects of patient-centered care were found to relate to health outcomes following an acute orthopaedic injury. This study revealed that patient perspectives of their care may influence their recovery, and therefore has implications for clinicians. Understanding patient perspectives on patient-centeredness can help clinicians develop a treatment plan that is best tailored to how their patients will best respond to care provision. This study revealed relationships between the recovery of patients with an acute orthopaedic injury and patient-centered care, as positive correlations were reported between positive health outcomes and positive patient perceptions of patient-centeredness.

The PPPC is an efficient tool for understanding patient perspectives on components of patient-centered care provision such as communication and partnership; however, a factor analysis revealed that the PPPC subscales were more suitably organized in the following manner: Subscale 1 (Clinician-Patient Dialogue: Items 1-8) and Subscale 2 (Clinician-Patient Alliance: Items 9-13). Correlations between scores from these newly proposed subscales and PRWE pain and function subscales revealed significant correlations between patient-centered care and pain reduction and functional recovery, especially at three months post injury. These findings suggest that patients’ perceptions of patient-centeredness positively evolve during recovery from acute orthopaedic injury.

Analysis of responses to the PPPC revealed that items from the proposed communication subscale were consistently ranked better than items belonging to the partnership subscale. Additionally, the items that were consistently ranked poorest related to mutual goal-setting and role determination. These results suggest that areas for growth in the provision of patient-centered care relate to finding common ground and clinician-patient partnership development. It is acknowledged that baseline perceptions of goal-setting are expected to be low, as it is at this point in time where efficient and accurate goals inspired from clinician’s impairment based assessments of the injury primarily contribute to a patient’s recovery. As well, these findings may be attributable to the fact that the PPPC is being applied in a surgical context rather than the family medicine context from which it was originally developed.² The significant improvement

of patient perceptions of items relating to mutual goal-setting and role determination at three months post injury suggests that clinicians and patients were able to successfully discuss goals and roles over time. It is proposed that as time progressed, clinicians were able to understand the occupation and participation needs of their patients with respect to the use of their wrist, which attributed to the improved scores in goal-setting and role determination.

Over a three month period, PPPC scores decreased indicating more positive patient perspectives of how patient-centered their care was. As well, PRWE scores decreased indicating reduction in pain and improvement in functioning. At three months post injury, more correlations were observed between PPPC and PRWE subscale scores. At three months post injury, it is likely that clinicians would focus attention on how their patients have resumed functioning, which could contribute to improvements in patient's perceptions of how much their clinician values their healthcare needs and wants. This can serve as evidence to support the hypothesis that positive perceptions of patient-centeredness correlate with reduction in pain and improvements in functioning following distal radius fracture.

Research has revealed that patient-centeredness contributes to improved health outcomes, reduced health costs, and improvements in patient satisfaction.^{2,12} This study attempted to strengthen this evidence by identifying how patient perceptions of their care relate to positive health outcomes. The empirical evidence provided by this study can be applied in conjunction with theoretical evidence to promote patient-centered care in all healthcare disciplines. Self-Determination Theory and Self-Regulation Theory are just two theories of human behaviour and goal-attainment that explain how goal attainment in healthcare is optimized when patients are involved in their care.^{3,4} Briefly, these two theories employ concepts of human behaviour and motivation to suggest that if patients are capable of identifying personal value in their healthcare actions, they will be more likely to engage in behaviour that supports the attainment of positive health outcomes.^{3,4,13}

A primary limitation to this study is that it is not highly generalizable, as it focuses on addressing the needs of distal radius fracture patients only. The recovery process of acute orthopaedic injuries such as distal radius fractures are unique and it is therefore proposed that the results reported in this paper reflect the perspectives of patient-centered care provision belonging only to those who have experienced such an injury. Another limitation to this study is the fact that not all patients share a common outlook on care provision. Some patients are more receptive to the biomedical approach to healthcare and want more of a professional-centric clinical interaction.² As suggested by Stewart et al.², it is the clinician's responsibility to identify these patients and modify their actions accordingly. By identifying the approach to care provision to which a patient will be most receptive, a clinician is engaging in fact in patient-centered care, once again emphasizing the place for patient-centeredness in healthcare.

Conclusion

This study revealed that positive patient perceptions of patient-centered healthcare experiences are related to positive health outcomes following distal radius fracture. Patient perceptions of patient-centered care were explored and related to experiences of pain and functional recovery following distal radius fracture.

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3.2 Implications for this thesis

This prospective cohort study revealed patient-perspectives on patient-centeredness in a clinical setting and answers the second research question of this thesis. This study provides empirical evidence to complement the extracted information from the scoping review in Chapter 1.

Chapter Four

DISCUSSION AND CONCLUSIONS

4.0 Discussion

This chapter presents an overall discussion of the thesis.

4.1 Overall Conclusions

The results from the scoping review revealed that approaches to patient-centered care provision are similar across healthcare disciplines as they all target achieving effective communication, partnership, and health promotion. The effectiveness of patient-centered approaches to healthcare was tested in the prospective cohort study which identified patient-perceptions of patient-centeredness and related these to health outcomes following distal radius fracture. Positive correlations between positive patient perspectives of their care and reduced pain and improved functioning following distal radius fracture is indicative of the important role that patient-centered care plays in an individual's recovery from acute injury.

4.2 Limitations and strengths of thesis

Limitations to this thesis include the fact that while the results from the scoping review are generalizable to a range of healthcare disciplines, the results from the prospective cohort study apply to patients recovering from an acute orthopaedic injury. While this fact limits the generalizability of this thesis, the prospective cohort study's findings contribute to the evidence supporting the need for a rehabilitation-specific model of patient-centered care. This thesis provides the empiric evidence supporting patient-centered care provision in rehabilitation and serves to complement the existing theoretical evidence supporting the promotion of patient-centered care in rehabilitation. Behaviour and motivation theories such as Self-Determination Theory and Self-Regulation Theory contribute to this theoretical evidence by identifying that patients will be more likely to pursue behaviour that facilitates positive health outcomes if they find value in their healthcare goals and treatment plans (Deci & Ryan, 2000; Carver & Scheier, 1990).

A second limitation to this thesis is the fact that responses to healthcare provision approaches are influenced by individual preference and past experiences. Not all patients may be receptive to a patient-centered approach to healthcare, and may feel more comfortable receiving care from a biomedical perspective rather than from a biopsychosocial one. This limitation is addressed by the tenets of patient-centered care. By communicating with patients, clinicians will be able to identify which approach to healthcare provision their patient is most receptive to and modify their interactions accordingly. Through this action, clinicians will develop a partnership with their patient that is either more professional-centric or patient-centric. Regardless of the type of partnership, the clinician is still acknowledging a patient's preference for care and is ultimately applying patient-centered care to their practice.

4.3 Implications and future research

This thesis can serve as a stepping stone for the future development of a rehabilitation-specific model of patient-centered care provision. In applying the evidence proposed by this thesis' scoping review, any proposed model of patient-centered care must include effective approaches to communication, partnership, and health promotion. As well, a rehabilitation-specific model of patient-centered care provision may be influenced by the results from this thesis' prospective cohort study, which identified that patient-centered processes such as collaborative goal-setting and mutual decision making are components of patient-centered care that must be fostered throughout the clinical relationship.

Positive implications from the development of a rehabilitation-specific model of patient-centered care provision could include positive patient health outcomes, as well as enhanced patient satisfaction and emotional well-being during a time of need. Patient-centered care provision acknowledges a patient's biopsychosocial needs as well as their biomedical needs. Future research is encouraged to contribute further empirical evidence relating patient-centered care and positive health outcomes.

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