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Transient Disablement in the Physically Active With Musculoskeletal Injuries, Part I: A Descriptive Model

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Context: Disablement theory has been characterized as the sequence of events that occurs after an injury, but little research has been conducted to establish how disablement is experienced and described by physically active persons.

Objective: To describe the disablement process in physically active persons with musculoskeletal injuries.

Design: Concurrent, embedded mixed-methods study. For the qualitative portion, interviews were conducted to create descriptive disablement themes. For the quantitative portion, frequencies analysis was used to identify common terminology.

Setting: National Collegiate Athletic Association Division I collegiate and club sports, collegiate intramural program, large high school athletics program, and outpatient orthopaedic center.

Patients or Other Participants: Thirty-one physically active volunteers (15 males, 16 females; mean age = 21.2 years; range, 14–53 years) with a current injury (18 lower extremity injuries, 13 upper extremity injuries) participated in individual interviews. Six physically active volunteers (3 males, 3 females; mean age = 22.2 years; range, 16–28 years) participated in the group interview to assess trustworthiness.

Data Collection and Analysis: We analyzed interviews through a constant-comparison method, and data were collected until saturation occurred. Common limitations were transformed into descriptive themes and were confirmed during the group interview. Disablement descriptors were identified with frequencies and fit to the themes.

Results: A total of 15 overall descriptive themes emerged within the 4 disablement components, and descriptive terms were identified for each theme. *Impairments* were marked by 4 complaints: pain, decreased motion, decreased muscle function, and instability. *Functional limitations* were denoted by problems with skill performance, daily actions, maintaining positions, fitness, and changing directions. *Disability* consisted of problems with participation in desired activities. Lastly, problems in *quality of life* encompassed uncertainty and fear, stress and pressure, mood and frustration, overall energy, and altered relationships. A preliminary generic outcomes instrument was generated from the findings.

Conclusions: Our results will help clinicians understand how disablement is described by the physically active. The findings also have implications for how disablement outcomes are measured.

Key Words: conceptual model, mixed methods, impairment, functional limitations, disability, quality of life

Key Points

- We identified descriptive themes in each of the 4 disablement components: 4 impairments, 5 functional limitations, 1 disability limitation, and 5 quality-of-life changes.
- Integrating a disablement model into the context of clinical research will improve our understanding of the disablement process and the relationships among the disablement components.
- Appropriate outcomes tools based on the identified disablement themes will need to be validated to assess the effects of interventions on the treatment of musculoskeletal injuries in the physically active.

Outcomes assessment is part of a framework used to determine quality assurance. Donabedian[1–3] described the term *outcomes* as part of his assessment-of-care process. He determined that quality assessment consists of 3 elements: (1) structure, (2) process, and (3) outcomes. The quality-assurance model set forth by Donabedian[1,4] conveys the importance of patient values in the outcomes process. Disablement models have been commonly used in the allied health fields and medicine to measure patient values and, thus, to understand how a person may be affected through the disablement process.[5–13] These models present a theoretical schema for understanding the sequence of events that occurs after an injury, illness, or dysfunction that ultimately results in some form of disablement and changes in a patient's quality of life. Disablement paradigms, therefore, focus on the physical manifestations of injury and the subsequent effects on a patient's ability to function in actions, activities, and roles expected by and of the patient. They also provide a paradigm for measuring disablement in clinical practice and research. Most notably, disablement theory provides the basis for outcomes measurement in clinical practice. For example, Figure 1 demonstrates how disablement theory helps to describe the discrete effects that an ankle sprain may have on a soccer athlete.

A simple disablement model, described by Nagi and later adapted by both the Institute of Medicine (IOM) and the World Health Organization, describes the main pathway of the disablement process as 3 sequential and interrelated components that result from a condition: (1) impairments (IMPs), (2) functional limitations (FLs), and (3) disability (DIS).[13–16] Disability is the end product of the disablement process but is not an unavoidable consequence of having a condition, impairment, or even a functional limitation.[17] In fact, disability is preventable, and disability-prevention models assume that disability

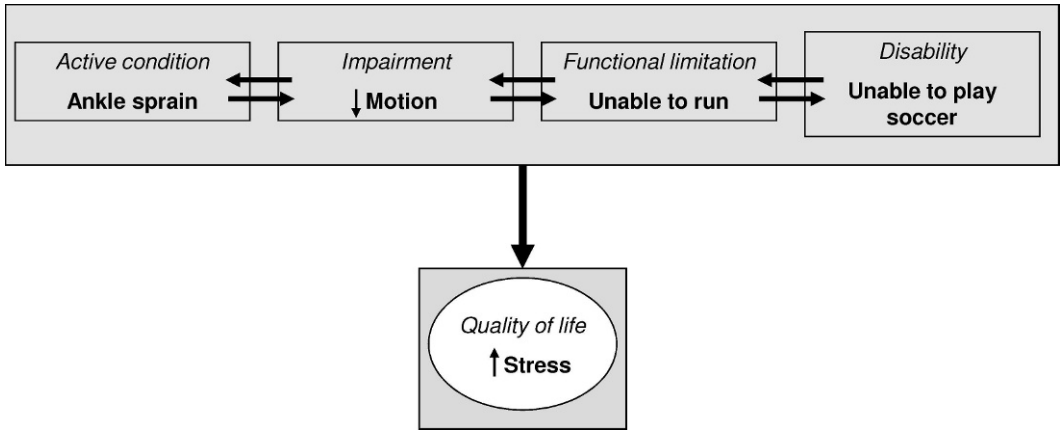

Figure 1. Disablement model for an ankle sprain.

can be prevented at any point in the condition's natural history.[6]

In biopsychosocial models, quality of life (QOL) refers to changes in physical, psychological, and social function. This concept is not included in the IOM's main disablement pathway but is acknowledged as a factor affected by negative personal and social changes during the disablement process. Commonly, research in medicine and physical rehabilitation refers to QOL as health-related quality of life (HRQOL). The term *HRQOL* is used very broadly, subsuming some of the components of the main disablement pathway in addition to focusing on personal and social changes in response to injury.[18] For example, the Medical Outcomes Study[19,20] created the Short Form-36 (SF-36) to measure HRQOL. The scale includes questions regarding both physical health and mental health scales. Components of the physical health scale include questions regarding changes in physical functioning, pain, and physical role. These components would be normally classified as IMPs and FLs in the main disablement pathway in the IOM disablement model, but in the SF-36, they are also measured in the broader context of HRQOL. The mental health scale includes questions on a variety of topics, including vitality, social functioning, emotional role, and mental health. To avoid confusion in this article, we focus on QOL as changes that are the psychosocial consequences of disablement on the patient at the whole-person level, much like the components measured in the mental scale of the SF-36 but excluding the components of the physical health scale in order to avoid redundancy with the main disablement pathway.

Other important influences and results of disablement are represented as interacting with the disablement pathway. The disablement process is influenced by contextual factors.[14,17] Consequently, the severity and progression of the disabling process are dependent on environmental and personal factors. Environmental factors include "physical, social and attitudinal environments that affect an individual's life."[14] For example, activity modifications are considered a positive environmental factor that enable a patient to continue to function at the level he or she desires. Personal factors are the unique features of the patient, such as age, sex, history with disablement, and behavior patterns, that play a role in the patient's response to disablement. Both environmental and personal factors mediate the disablement experience and are sites for interventions or even explanatory factors for a patient's outcomes during the disablement process.

Both QOL and contextual factors within disablement models have very close links to the large body of psychosocial response to injury literature. The cognitive-appraisal models typically used to describe the psychosocial adjustments to injury use the same language of "personal" and "situational" factors in the cognitive appraisal of injury and the subsequent emotional and behavioral responses.[21] As is the case with disablement theory, personal factors and situational factors in cognitive-appraisal theory affect a patient's path through the injury process. More specifically, these factors can explain the way in which a patient interprets an injury, responds emotionally, and behaves.

Psychosocial responses are important to understand because of their interaction with QOL. The literature pertaining to injury response can explain many of the common QOL deficits seen in physically active patients postinjury. Research[21–28] in the psychosocial realm has documented the role of injury stressors, changes in self-confidence and self-efficacy after injury, altered mood states during injury recovery, and the importance of social support in the rehabilitation process. Another parallel can be drawn between disablement theory and psychosocial research in injury response because both models emphasize context in mediating a patient's pathway within recovery. Context and patient perceptions play significant roles in the local and global effects of injury on a patient. Research investigating the changes in QOL, as described by physically active persons with injury, is needed to develop clinically meaningful and sensitive outcomes tools.

To date, no researchers have attempted to develop an understanding of disablement language used by physically active persons to describe their experiences. Disablement paradigms have well-developed components (IMP, FL, DIS, QOL), but the descriptive natures of the limitations experienced by physically active persons with musculoskeletal injuries in each of the disablement constructs have not been documented.

The primary purpose of this study was to use a concurrent, embedded, mixed-methods design with a qualitative emphasis to examine the descriptive themes of the disablement process. Furthermore, the findings were enhanced with quantitative methods to identify common terminology used by participants to describe the disable-

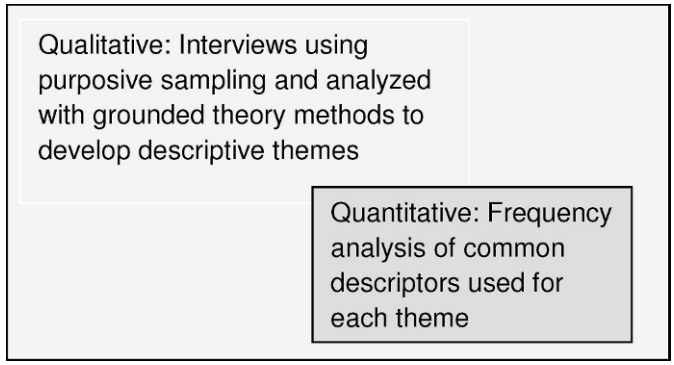

Figure 2. Concurrent, embedded mixed-methods design.

ment process. In combination, the descriptive themes and common terminology were used to develop a multidimensional, generic outcomes instrument. With grounded theory methods, we developed descriptive themes of physically active individuals with a musculoskeletal injury, and with frequencies analysis, we identified common terms selected by patients to describe the disablement process. A mixed-methods research design is well suited for the purpose of this study and has been used for investigations[29–32] in nursing and medicine. The mixture of qualitative data, used to explore the disablement experience, and quantitative data, used to obtain common descriptors of limitations, provides the ideal method for our purpose.

This study is significant because it advances research into the understanding of how physically active persons experience and describe the disablement process. In particular, we sought to understand the limitations that are common, despite different injuries, and most meaningful to the participants. Key experiences documented in this study will be used to develop a multidimensional, generic outcomes instrument that will fully measure the limitations that a patient with a musculoskeletal injury may experience.

METHODS

Design

Our intent was not to create a complex theoretical model explaining the relationships between and among the concepts but rather to focus on describing the experience and context for physically active persons experiencing limiting musculoskeletal injuries. Therefore, we used an embedded mixed-methods approach with both qualitative and quantitative data collected concurrently.[31]

The primary goal of the study was to create a description of the disablement process, which was achieved using qualitative methods. The secondary purpose was to identify the common descriptors of the disablement process using quantitative methods. In this concurrent, embedded design both sets of data were collected simultaneously, and the quantitative data played a supportive role to the qualitative methods (Figure 2).

For the qualitative portion, we used grounded theory methods for sampling and data analysis to better understand disablement, as described by the participants. In particular, theoretical sampling and the constant-comparative process were used.[33] Limitations that were identified consistently by the participants were transformed into descriptive themes within each of the existing disablement components (IMP, FL, DIS, and QOL). For the quantitative portion, we asked participants to identify pertinent terminology used to describe their limitations and selected the most relevant terms using a frequency analysis. This 2-part approach allowed us to interpret emerging descriptive themes by embedding the quantitative data with qualitative data. Specifically, the analysis of common descriptive themes and descriptors was used with the development of items for a generic outcomes instrument intended to measure meaningful changes in patients after injury.

Table 1. Total Participants Stratified by Setting and Injury Type

	Lower Extremity Injury, No.		Upper Extremity Injury, No.	
Setting	Males	Females	Males	Females
Collegiate	4	5	5	4
High school	0	4	2	0
Recreational	3	2	1	1

Participants

Volunteers were selected using the principles of theoretical sampling. Theoretical sampling is a grounded theory strategy in which the researchers begin with purposive sampling by choosing individuals with the experience of interest. After a point, the sample is based on emerging themes.

Because our goal was to describe the disabling process of injury in the ''physically active,'' participants were included if they met the criterion of persons who engage in physical activity at least 3 times a week. Additionally, participants must have been limited from physical activity for at least 2 consecutive days as a result of musculoskeletal injury. The limitation from physical activity was self-reported by the participants, and we chose an arbitrary 2 days of limitation to avoid excluding those who had chronic injuries but were still able to be involved in physical activity on a regular basis. We further stratified the population by injury type (lower extremity or upper extremity injury) and physical activity level (recreational or competitive) to ensure that the phenomenon of interest was fully disclosed. Subsequent sampling was further developed to include participants along the injury continuum, ranging from those with injuries that only affected them negatively during physical activity to those who were affected throughout their day as a result of the injury. In addition, we sought volunteers with chronic injuries.

The total sample included 31 participants (15 males, 16 females; mean age = 21.2 years; range, 14–53 years; 18 lower extremity injuries, 13 upper extremity injuries) from 4 data-collection sites. The competitive-athlete sample was collected from a National Collegiate Athletic Association Division I collegiate and club sports athletics program as well as from a large high school athletics program. Recreational athletes were recruited from the student population at the same university and from an outpatient orthopaedic center in the same area. Participant demographics are provided in Tables 1 and 2. (We conducted 2 pilot interviews before the study began, but these data were

Table 2. Participant Demographics and Diagnosis

Sex	Age, y	Activity	Competitive or Recreational Level	Diagnosis
F	14	Volleyball	Competitive	Anterior cruciate ligament reconstruction
M	15	Basketball	Competitive	Bankhart repair
M	16	Swimming	Competitive	Biceps tendon impingement
F	16	Basketball	Competitive	Ankle sprain, grade III
F	16	Soccer	Competitive	Bimalleolar fracture
F	16	Softball	Competitive	Hamstrings muscle strain
F	18	Tennis	Competitive	Midfoot sprain
F	18	Cheerleading	Competitive	Glenoid labral tear
M	18	Volleyball	Competitive	Lateral ankle sprain, grade III
F	18	Gymnastics	Competitive	Elbow dislocation
M	19	Gymnastics	Competitive	Ulnar fracture
F	19	Cheerleading	Competitive	Lumbar spondylosis
F	19	Gymnastics	Competitive	L4-L5 disc herniation
F	19	Gymnastics	Competitive	Ulnar collateral ligament (elbow) sprain
M	20	Volleyball	Competitive	Wrist sprain
F	20	Gymnastics	Competitive	First MTP LCL sprain
M	20	Gymnastics	Competitive	Bimalleolar fracture
M	20	Volleyball	Competitive	Glenoid labral tear
M	20	Gymnastics	Competitive	Fractured navicular
M	21	Gymnastics	Competitive	Rotator cuff tendinitis
M	21	Basketball	Recreational	Anterior cruciate ligament reconstruction
M	21	Rugby	Competitive	Midfoot sprain
F	21	Running	Recreational	Metatarsal stress fracture
F	22	Cheerleading	Competitive	Thoracic vertebral stress fracture
M	22	Baseball	Competitive	Shoulder bursitis and rotator cuff tendinitis
F	22	Swimming	Recreational	Multidirectional shoulder instability
F	23	Gymnastics	Competitive	Anterior cruciate ligament reconstruction
M	28	Golf, running	Recreational	Anterior cruciate ligament reconstruction
M	29	Basketball	Recreational	Ankle sprain, grade III
F	33	Running	Recreational	Hip flexor strain
M	54	Golf	Recreational	Shoulder adhesive capsulitis

Abbreviations: F, female; M, male; MTP, metatarsophalangeal; LCL, lateral collateral ligament.

not included in the analysis.) We collected all data while the participant was still experiencing symptoms from a current musculoskeletal injury but not until at least 2 weeks after the injury to ensure that the participant had the opportunity to fully experience the disablement process. Many of the data were collected after the first 2 weeks but while the participant remained symptomatic and could easily recall the experience.

Data Collection and Analysis

Participants completed 1 interview with the principal investigator; interviews lasted approximately 1 hour and ranged from 30 to 90 minutes. The interview guide consisted of closed-ended and open-ended questions and was built around the 4 disablement components in the IOM's disablement model (see Appendix). We chose to use the IOM's disablement model as the conceptual basis for this study because of its applicability to an athletic population, the model's clear operational distinction among the disablement constructs in the model, and the model's inclusion of QOL concepts.

Data collection occurred in a 2-step process within a single interview session. In the first step, participants identified common problems experienced as a result of their injuries from an exhaustive list compiled from terminology used in previously developed outcomes instruments. Within the same time frame, the qualitative data collection occurred when participants were asked to divulge the nature of the disablement experience. Data analysis occurred separately, but the 2 data sets were merged, so that related descriptors were paired with each descriptive theme that emerged to create the outcomes instrument. The data-collection and analysis steps for each data type are detailed below. A flowchart of data-collection procedures is shown in Figure 3.

Quantitative Data Collection and Analysis. A comprehensive list of descriptive terms for common IMPs, FLs, DISs, and QOL was provided so that the participants could refer to and choose problems that described their limitations within the disablement process. We compiled this list because we were interested in the language used to describe disablement and in how the participants used common medical terms in their everyday existence with injury and disability.

At the beginning of the interview, the participant was presented with the list of IMP problems and asked to identify all that applied to his or her injury. The participant was then asked to talk about any terms that were confusing. The same procedures were used for identifying and describing FLs, DISs, and QOL problems. Participants were encouraged to include any other problems that they experienced but that were not on the list. A frequency analysis of all terms was completed and saved to later merge with the qualitative findings.

Qualitative Data Collection and Analysis. During the qualitative portion of the interview, participants were asked to elaborate on their disablement experience and to describe how each of the previously identified problems affected them. More specifically, examples and qualifiers such as time

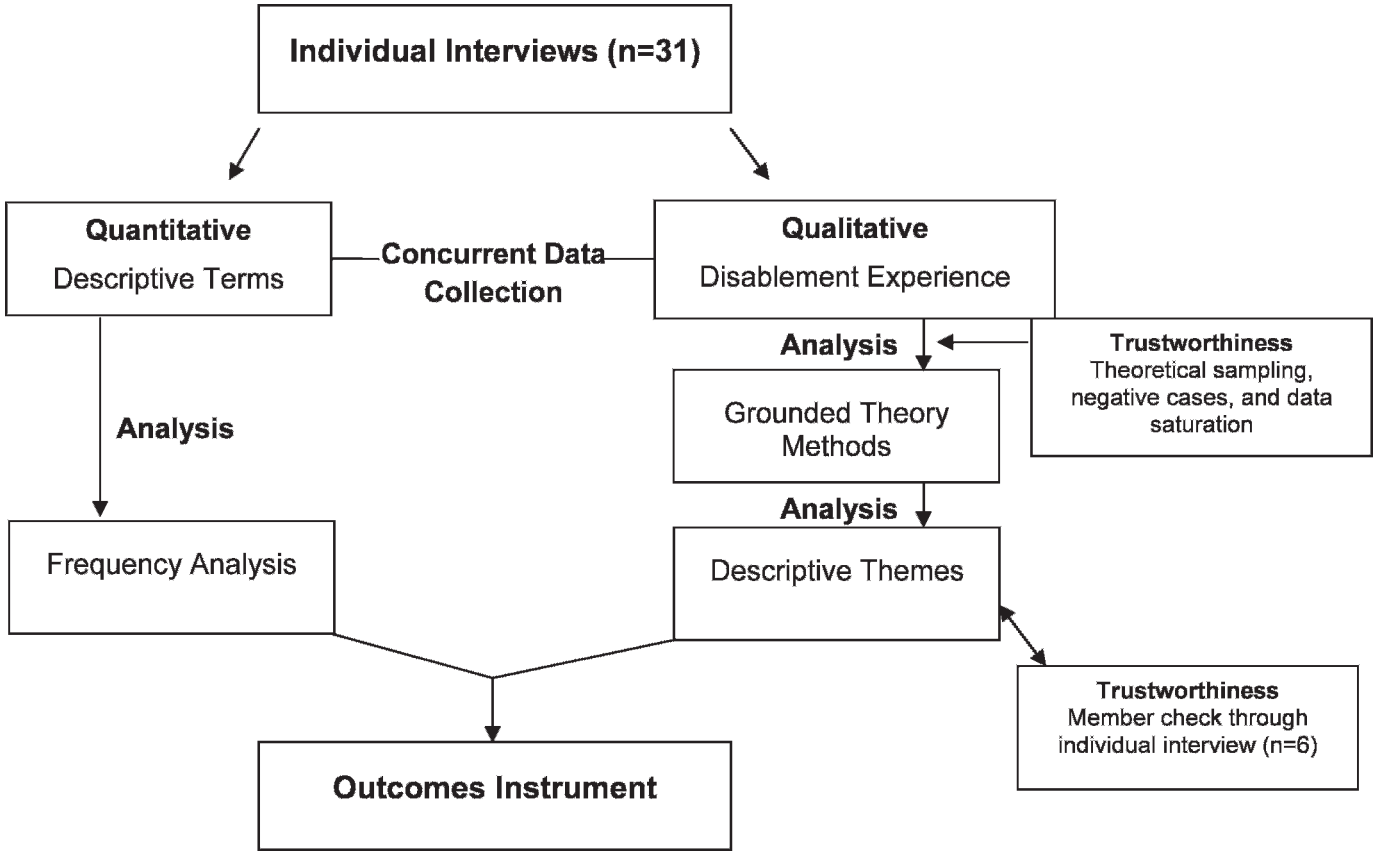

Figure 3. Data-collection and data-analysis flowchart.

frame and severity were requested. Data were collected through a tape-recorded, semistructured interview. Interviews were transcribed verbatim, with all personal identifying information removed. After transcription, each interview was checked for accuracy by the interviewer.

The primary analytic technique was constant comparison, a process by which each piece of data is compared and contrasted with other data to build a conceptual understanding of the descriptive terminology used within each of the disablement components.[34] All data were analyzed by hand. Data were coded, and common descriptors were identified and tested against incoming data. Coding procedures for the data included starting line by line with first-level coding, followed by selective coding of the descriptors that were transformed into ''descriptive themes.'' These descriptive themes were common threads in descriptive words used by participants to describe similar limitations. Limited focus was placed on theoretical coding because investigating causality in the theory was beyond the scope of this study. Data collection continued until no new descriptors or themes emerged, signifying that saturation had been reached.

Trustworthiness of the Qualitative Data. Trustworthiness of the data was established in multiple ways, including theoretical sampling, negative case analysis, member checks, and collection of data until saturation occurred. All of these steps help to ensure the extent to which the data can be trusted. The methods used to establish trustworthiness are described in this section.

We followed the principles of grounded theory sampling, as described by Glaser and Strauss.[33] Both competitive and recreational physically active participants with a variety of upper and lower extremity injuries were included. We also sought to include negative cases, or participants who might have had different experiences. Based on a decision tree, we theoretically thought that negative cases could emerge from the interviews. In some instances, competition level or injury severity was used to seek negative cases.

The model was checked for accuracy with member checks in the form of a one-time group interview, and the descriptive terminology used in the model was further clarified with information received from the group interview. The group interview occurred after all of the 31 individual interviews had been completed and the descriptive model had been constructed. No new descriptive themes within the disablement constructs were suggested by the group interview. Six physically active participants (3 males, 3 females; mean age = 22.2 years; range, 16–28 years) with a history of musculoskeletal injury participated in the group interview. Four participants in the group interview had not been involved in the original interview cohort, whereas 2 participants from the cohort were included because they met 2 criteria that we wanted to be sure to include in the group interview. One participant was chosen for the interview because of age, and the other was chosen because of the severity of injury. Group-interview participants were recruited separately from those included in the individual interviews.

The principal investigator (L.I.V.) conducted the group interview. At the start of the group interview, participants were asked to think back to a recent injury and were given time to write about the problems that the injury presented

Table 3. Impairment Descriptors

Impairments (N = 31)		
Descriptive Theme	Percentage With Limitation	Terms Used to Describe Limitation (% of Participants Citing Term)
Pain	93.55	Pain (93.55)
Motion	93.55	Movement (83.87), ease (87.10), flexibility (77.42), stiffness (83.87)
Muscle function	90.32	Strength (81.65), endurance (67.74), fatigue (58.07), power (74.19)
Instability	77.42	Stability (58.07), giving way (45.16)

in their lives. They were encouraged to use as much descriptive terminology as possible. Afterward, we presented the results of the 31 interviews, including the disablement model with descriptive themes, to participants, who were given the opportunity to refute, refine, or accept the descriptive model as it was presented. The language was refined, but no subsequent changes were made to the descriptive themes.

RESULTS AND DISCUSSION

Our purpose was to use a mixed-methods approach to identify and describe the disablement process as experienced by a physically active person with a musculoskeletal injury. The theoretical foundation of appropriate outcomes assessment in health care is disablement; thus, it is important to further understand the disablement process in the physically active. The 4 components of the IOM disablement model were used to structure this study. In all, 4 IMPs, 5 FLs, 1 DIS, and 5 QOL descriptive themes emerged from the interviews. We also identified and calculated common descriptors for each theme.

This section focuses on the descriptive themes in each of the disablement components. Each section also includes a table with common descriptors for each of the descriptive themes. Included are quotes that verify and detail the experiences described by the participants. In addition, a discussion of the themes is provided to help place the context of each theme into related research in the fields of rehabilitation, physical medicine, and sport psychology.

Impairments

The *IMPs* are defined as a loss or abnormality of a physiologic or anatomical nature attributable to an active condition.[17] Because IMPs are abnormalities at the site of the injury, the causes of these problems tend to be physiologic in nature. For example, an ankle sprain sets the acute inflammatory process in motion, and the direct manifestations of the inflammatory process are regarded as IMPs. Some of the cardinal signs of inflammation (heat, pain, swelling, and redness) best explain the signs and symptoms of IMPs.[35] Four descriptive themes that arose under IMPs were pain, decreased motion, decreased muscle function, and instability (Table 3). These are all common IMPs seen within the natural sequelae of an acute or chronic musculoskeletal injury, and they were also the descriptive themes most consistently described as the chief limitations.

Pain. Pain was the IMP that was most often cited and the underlying cause for most other disablement limitations. Although most patients spoke of pain as subsiding with time, pain was also one of the largest concerns for each patient. Pain is also related to 2 other descriptive impairment themes that emerged: motion and muscle function. Pain was a concern not only during physical activity but also with activities of daily living. Joan, a 33-year-old recreational runner, spoke about the effects of pain on all of the disablement dimensions:

> The pain, I thought, was related to exercising and that if I stopped exercising that it [pain] would go away. That didn't happen and it's been months. It has affected my ability to exercise the way that I typically would. I can run, but it hurts considerably more afterwards. In daily activities it hurts when I walk. It hurts when I roll over at night. I can't do sit-ups or crunches. As far as exercises goes it has knocked out a lot of things that I had done regularly, and just in normal life getting out of a car hurts [sic]. To go up and down stairs it hurts. It's not this excruciating pain that leaves me unable to do things but it's uncomfortable.

In some cases, pain was only experienced during highly skilled activities, as in the case of Joe, a 20-year-old elite volleyball athlete, who stated, "Pain is a real problem sometimes when I don't have a perfect mechanical swing … or if my shoulder is off then it kind of tweaks that area and it's a very severe pain. I most likely would be pain free if I went through an entire day without playing volleyball."

Decreased Motion. Motion was a complaint with 2 subcategories: (1) range and (2) speed or ease (or both). For severe cases in which surgical intervention was typically required, the major complaint was that the available range of motion was limited. Mike, a 54-year-old golfer who was diagnosed with adhesive capsulitis, said his "number-one problem" was being unable to move through a range of motion:

> Movement is the number-one problem because I have had dramatically decreased range of motion … it has been some months and I have had substantial improvement so that I am more hopeful. I may still need surgery at some point. Over the last week I have made such progress in PT than I have over months that I am really happy with that, but it is still a problem because of the things that I can't do. I can't lift my arm over my head. I can't lift it behind my head.

In other cases, the speed or ease (or both) of moving through a range of motion was the concern. John, a 22-year-old baseball player with shoulder bursitis, was concerned with his ability to move his arm quickly: "If I wanted to raise my arm really quickly above my head, like if I were to jump up and grab something, it would hurt. If I did need to move my arm above my head then I would have to go really slow."

Decreased Muscle Function. *Strength*, *endurance*, and *power* were all words used to describe the changes that occurred with muscular performance. Multiple authors[35–38] have demonstrated that these changes occur after musculoskeletal injury. Altered muscular performances may be the direct cause with injured muscles or tendons. With joint injury, neuromuscular control is commonly altered.[39] The degree of concern about muscular- perfor-

Table 4. Functional-Limitations Descriptors

Functional Limitations (N = 31)		
Descriptive Theme	Percentage With Limitation	Terms Used to Describe Limitation (% of Participants Citing Term)
Skill performance	83.87	Running (61.29), jumping (58.07), kicking (38.71), throwing (19.36), catching (6.45), coordination (29.03), balance (48.39)
Daily actions	87.1	Walking (41.96), squatting (35.48), lifting (32.26), carrying (22.58), bending (16.13), reaching (16.13), going up/down stairs (41.94)
Maintaining positions	58.33	Standing (35.48), sitting (12.90), sleeping (45.16)
Fitness	51.61	Conditioning/cardiovascular endurance (51.61)
Changing directions	64.52	Twisting (38.71), pivoting (41.84), cutting (29.03), starting/stopping (22.58), turning (3.23)

mance limitations typically coincided with the participant's level of function at the time of the interview. A 22-year-old recreational swimmer who was rehabilitating her shoulder after a Bankhart repair for multidirectional instability felt that "I still haven't built up a lot of strength after my surgery." She went on to talk about her concern with endurance: "I can only do stuff for a certain amount of time before my arm gives out and I can't move it anymore. It gets really tired. After doing rehab for 20 minutes I can't do anything. My arm is just dead. Just picking up anything I can tell that it [arm] is tired."

A person with a higher level of function typically talked about a decrease in power as the hindrance. Dan described his problem with power saying "… my shoulder gets tired and sore and I can't keep up with it [workout]. I can generate force early but it decreases over time. I can't produce as much power as I did before the injury."

Instability. Stability was described in 2 ways that can be best explained as either mechanical or functional in nature. Decreased stability resulting from injury has also been cited in the literature. Researchers[40] have shown that stability can have mechanical or functional (or both) components. The mechanical component of instability is related to those injuries in which the supporting structures about a joint have been affected. The literature regarding ankle instability typically examines the relationship between joint laxity and instability. Interestingly, authors[41–44] have also investigated the contributions of the neuromuscular system to feelings of instability, which is termed *functional instability*. Decreased stability was one concern for participants with ligamentous injuries, for example, a 20-year-old elite gymnast with a ruptured lateral collateral ligament of the first metatarsophalangeal joint of the foot: "You need a lot of power and a lot of my power comes from legs and lower half and I can't push out of my right foot. I can't favor my left foot so every time I go to do anything powerful or forceful my toe will pop out of joint and then that's painful."

Instability terms such as *giving way* or *giving out* were also used by participants whose injuries were not due to structural (eg, ligamentous) injury. In these cases, decreased functional strength caused functional instability. Participants described feeling fatigued postexercise and subsequently feeling unstable. For Katie, a 16-year-old soccer athlete and dancer, functional instability was a concern: "It [ankle] doesn't move very fast and not very easily and not very long and when it does move for too long it has a tendency to give out."

Functional Limitations

Five descriptive themes arose that can be categorized as FLs, which have been defined as *"limitation in performance at the level of the whole organism or person."*[12] The specific focus of FL is the limitation of actions that a person would normally do. Thus, the distinction is made between the local effects of an injury (IMP) and its effects on performance of an action (FL). For example, a patient with a lateral ankle sprain may have limitations performing actions such as squatting, running, and jumping.

A quandary in developing descriptive themes for FLs is that limitations may vary widely based on the injury and the normal actions required of a patient during physical activity. A clinician working with a patient with an anterior cruciate ligament tear versus a patient with carpal tunnel syndrome finds that the specific FLs described by each patient differ greatly. One patient may complain of the inability to climb stairs and to squat, whereas another patient may complain of an inability to grasp or carry heavy objects. Therefore, the descriptive themes do not focus on specific actions. Rather, the themes are broader in nature and include problems with skill performance, daily actions, maintaining positions, fitness, and changing directions. The specific terms used to describe limitations in each of the descriptive themes are presented in Table 4.

Skill Performance. Two themes are subsumed under the larger theme of skill performance. Participants described a decreased ability to perform basic skills that constitute larger components of sporting and physical activities. These activities included but were not limited to running, jumping, kicking, throwing, and catching. In addition, participants mentioned that the quality of motion was hindered. Words used to describe these problems included *coordination*, *agility*, and *balance*. Tom, a 20-year-old competitive athlete who was recovering from a bimalleolar fracture, offered the following explanation:

> I worked a lot on that to get my coordination back. I was on crutches for so long that when I finally did get back [to activity] it was tough to walk normally, and squat down. [It was tough] getting everything to function together: my knee, my hip and my ankle. It's still a problem but it has gotten a lot better.

Daily Actions. The participants also discussed how their activities of daily living were affected negatively by their inability to perform simple actions. The limiting action was typically very specific to the upper or lower extremity

Table 5. Disability Descriptors

Disability (N = 31)		
Descriptive Theme	Percentage With Limitation	Terms Used to Describe Limitation (% of Participants Citing Term)
Participation in physical activity	100	Sport (96.77), leisure activities (54.84), hobbies (58.06), recreation (70.97)

injury. In John's case, his bursitis affected his daily actions in the following way:

> I wasn't able to move my right arm above shoulder level, for example, to reach for things out of a cupboard or something like that. If I had to lift things that were heavy and had to reach out far away from me to grab them then it would hurt my shoulder. If I go to lift something out in front of me or above my head then it was a little too heavy for my arm and I couldn't hold it up.

Lauren, a 21-year-old recreational runner with a stress fracture, also spoke of her injury as limiting her daily actions:

> Walking, though it isn't the most painful of things, it is something that you have to do everyday, especially being on such a huge campus. I think it bothers me because I am always doing it … it is so slow. I have to give myself an additional 15 minutes to get to a place.

Maintaining Positions. One FL dimension that was commonly verbalized was a problem with maintaining certain positions. Patients spoke of the inability to stay in one position for a long period of time without becoming symptomatic. Examples were standing, lying down while sleeping, sitting down, bending over, and squatting. In addition, participants also indicated that they became more symptomatic after moving out of a position held for a prolonged period of time. An 18-year-old tennis player with a midfoot sprain, Kelly, described her problem with maintaining positions:

> It bothers me more every time I wake up in the morning because I haven't used it for the last 6 or 7 hours. That is when it is the most painful. During the day I can walk without the crutches, but in the morning I can't put my foot down. It annoys me because I have just given it rest, but it seems worse. So it bugs me that it hurts me more when I am not doing anything than when I am doing something.

Fitness. Participants described a change in their overall fitness status, especially when normal, preferred activities were limited by injury. Anecdotally, some participants describe not being "in shape" for specific activities. For example, runners do not feel like they are in "running shape" unless they run. Jennifer, a 19-year-old with spondylosis and 2 herniated lumbar discs, described the effects of her chronic injury on her fitness level. At the time of the interview, Jennifer had been unable to participate in sport for approximately 6 months.

> I love to run and I feel very out of shape. I can't even power walk fast so that has gotten to be a problem. It's a big problem because I am so used to being fit. In the beginning I was getting worn out from walking and from stairs and I thought that it had to do with losing strength in my legs. I know that when I start training I am going to be a year behind everyone else. I already started lifting so I am starting to get the strength back and I've already started flexibility so I am getting all those components back but the last thing that I will do is run.

Changing Directions. Changing directions was a dilemma most participants discussed. More specifically, changing directions was a problem during both physical activity and activities of daily living. Problems with changing directions in daily activities were present most often in those participants with the most disabling conditions. Words used to describe changing directions included *turning*, *twisting*, *cutting*, and *pivoting*. A rugby player with a midfoot sprain talked about the negative effects his injury had on his ability to perform cutting motions: "Cutting is a problem because it is a huge thing for rugby and like any sport you have to cut, or cut and pivot. When I do my workouts for rugby I do cutting movements like 'Z patterns' or functional activities to increase my speed so that I can run better."

Disability

Disability has been defined as the *"limitation in performance of socially defined roles and activities within a sociocultural and physical environment."*[17] The emphasis on activities highlights the concept that disability refers to difficulty with a role versus difficulty with a task (FL).[45] Participation limitations in physical activity was the descriptive theme that emerged under the DIS category. The descriptive terms used to describe the limitations are found in Table 5.

Ultimately, a normally physically active person wants to participate in the sport activity of his or her choice. If the deleterious effects of an injury limit a person's ability to do so, then a form of disability is being experienced. Consequently, an important outcome in this situation is full return to participation with minimal symptoms.

It is also important to note that expectations play a large role in understanding disability.[7,12,16,46,47] In this study, competitive and recreational athletes both expressed the importance of participating in physical activity. The role of physical activity for the competitive athlete was greater than for the recreational athlete. Therefore, a socially defined role for one person may hold more importance than it does for another person. Participants described the same set of problems, but the magnitude of the problem varied with their expected level of involvement in physical activity. Research[48] regarding athletic identity can be used to explain the importance of physical activity for competitive athletes. Specifically, those participants with a greater degree of athletic identity experienced more disability than did those participants with a lower degree of athletic identity.

Participation in Physical Activity. Participants believed that one of the most deleterious aspects of the disablement process was the inability to be involved in physical activity. Furthermore, the physical activity theme had 2 distinct facets. First, individuals were unable to participate in the

Table 6. Quality-of-Life Descriptors

Quality of Life (N = 31)		
Descriptive Theme	Percentage With Limitation	Terms Used to Describe Limitation (% of Participants Citing Term)
Uncertainty and fear[a]	NA	NA
Stress and pressure	61.29	Stress (54.84), pressure (41.94)
Mood/frustration	64.52	Mood/frustration (64.52)
Overall energy	51.61	Energy (51.61)
Altered relationships	38.71	Social interaction (35.48), personal interactions (25.81)

Abbreviation: NA, not applicable.

[a] Terms were not included on list provided to participants.

physical activity of their choice. Jennifer described her frustration by saying

> I know that I can't do gymnastics forever and eventually you have to give it up, but I didn't expect it to already happen. I think that I can get back into it [gymnastics]. Right now it is always on my mind … it also upsets me when they [other athletes] complain about being sore. I am just like it would be great if I was just sore. I think some people just take it [being able to participate] for granted.

Second, individuals felt that they could not participate in leisure activities of a physical nature. Dan, a competitive athlete, explained this limitation by stating

> I am a very active person outside of the gym and I do a lot of sports with my friends and sometimes I can't participate in them because of my shoulder. This past summer I couldn't go golfing. I also like to do sports like wake boarding but I couldn't do that as much as I wanted to this summer as well.

Similarly, recreationally active participants also expressed these concerns. Lauren mentioned, "I am limited in what I can do. If I had my choice I would like to run in my free time. I would like to be active or I would like to go on walks." These responses incorporate a sense of how the participants were affected in a variety of contexts rather than in sport alone. This finding is especially interesting in the cases of competitive athletes; in order to measure true treatment success, a clinician may want to ask questions outside the realm of sport.

Quality of Life

Quality of life refers to factors that affect the quality or goodness of life, including psychosocial and physical conditions. In the IOM's disablement model, QOL includes both psychosocial and physical domains and is closely related to health status, as defined by the World Health Organization.[17,49] Although our study was not designed to provide a full understanding of the psychosocial aspects of injury, a general consensus exists that injury and a patient's QOL are related. Understandably, an injury may affect a patient's sense of total well-being. Thus, QOL is an important variable in understanding the effect of an intervention.

The measurement of QOL can be affected by a number of factors other than the injury, but the themes that arose in this study were consistently linked to the musculoskeletal injury from which the participant was suffering. Participants consistently disclosed 5 descriptive themes: increased fear and uncertainty, increased stress and pressure, negative changes in mood with increased frustration, decreased energy levels, and altered relationships. The descriptive terms for each theme are found in Table 6. We did not calculate frequencies for the fear and uncertainty theme because such terms were not included in the original comprehensive list presented to the participants.

Increases in fear and uncertainty, increases in stress, negative changes in mood and frustration, and negative changes in relationships can all be tied to the literature in sport psychology. Cognitive-appraisal models provide some explanatory models for how a person with a sport-related injury interprets the effect of the injury and, therefore, how he or she feels and responds to the situation. Cognitive-appraisal models integrate both personal and situational factors to explain how an athlete will appraise an injury once it has occurred.[22]

Generally, participants experienced many, if not all, of these QOL changes. The degree to which some of these were experienced mostly depended on 2 factors: (1) the chronicity of the injury and (2) the participant's level of competition. For example, increases in stress and pressure were most notable in participants who were involved in competitive activities. In addition, the duration of an injury seemed to also affect the intensity of the QOL changes.

Uncertainty and Fear. The participant's description of uncertainty and fear are 2 responses that may be linked to self-confidence and self-efficacy. Researchers[22] have shown that both self-confidence and self-efficacy decrease as a result of injury. Participants described feeling uncertainty about their recovery from the injury. Specifically, they were concerned about their ability to fully return to sport. In addition, some expressed fears because their day-to-day life had changed so dramatically. Others even articulated a fear of reinjury. Although fear and uncertainty are known to be discrete and separate psychological components, participants typically used these words in conjunction. Kelly described her fear as follows:

> When I see some of my teammates doing the drill that I did when I fell down and I think that when I have to get back on court I will get so nervous to do that because I feel that it is so possible that it may happen again. The fact that I can't move my foot at all in one direction makes me think that I don't even have to be doing that drill [to get hurt again] and I can hurt it [foot] even more.

Stress and Pressure. Stress is a concern for athletes as it relates to injury interpretation, recovery, and coping.[23,50] Injury itself is considered a stressor, and the stress experienced from injury is related to the emotional disturbance and adjustment an athlete experiences. Additionally, greater stress levels are perceived when coping mechanisms are limited.[22–24,51]

Although all of those studied related increased levels of stress due to the changes in schedule and routine, competitive athletes also expressed a concern with stress related to return to participation. Competitive athletes tended to verbalize concerns about being able to return to participation at the same level as well as intrinsic and

extrinsic pressures to return to sport. Perceived extrinsic sources of pressure included other teammates and coaches.

Stress arose from musculoskeletal injuries for several reasons. Participants described stress stemming from the uncertainty of the injury and rehabilitation prognosis. James, a 16-year-old swimmer with chronic shoulder pain, described an increase in stress by saying, "Now I am stressed that I am putting a lot of pressure on myself and I don't feel that I am where I was before I got hurt. At the beginning of the season I was right on track to reach my goals and now I have taken a few steps back so that I have to make up all that ground." Other participants said that being physically active was a form of stress relief and that the injury had altered that coping mechanism. Lauren described how being more sedentary had affected her:

> I rely on fitness activities to keep my emotions in control and that's something that has been affected by this [injury]. I feel that if I am active I feel better about myself. I feel that fitness is a stress relief and without that with the stress of everything like having to get up early so that I can ride the bus [and] having enough time to walk to one place or another and having to wait for a bus [and] having to plan time to meet with my doctor.

Mood and Frustration. An athlete's perception of social support and stress plays a role in changes in mood.[25] Those with greater perceived social support systems tend to have fewer disturbances in mood states, whereas those with more stressors have greater disturbances.[52] Mood disturbances also correspond with an athlete's perception of recovery from an injury.[26] Common mood states described in the literature[53] include anxiety, tension, depression, frustration, anger, and boredom.

Participants discussed their moods and how they were affected after injury. Some talked about being in a "bad mood" after a practice that didn't go well. For example, Dan discussed "feeling low" after practice because "I couldn't accomplish what I wanted to accomplish." Dan also mentioned how these feelings, in particular, "carry over to my whole life." Mike more specifically linked frustration to changes in his mood:

> One of the most depressing things for me is that I will not be able to play golf this year. I love playing golf. I don't play very often … usually about 9 holes once a week … but that is my treat for the whole week. I usually don't play until Sunday afternoon when I am done with all the stuff that has got to get done with the house and it really is very intensely frustrating for me right now because there is no way that I can play golf.

Overall Energy. Few researchers have demonstrated changes in patient energy levels after a musculoskeletal injury other than in rare cases when depression occurs. An athlete may, however, experience a transient depressive state that differs significantly from clinical depression. Nonetheless, decreases in energy could be tentatively linked to a depressive mood state.[54] Healthy elite athletes had higher levels of vitality, as measured by the SF-36, when compared with norms, but these values dropped significantly after injury precluded physical activity.[55] In addition, periods of inactivity due to injury may result in decreased levels of natural endorphins, which are released from the body during exercise, thus affecting feelings of energy and vitality.[56] The participants who had been removed from physical activity talked about how being relatively sedentary influenced their energy levels. They felt that their energy levels decreased while they were inactive. Joan described how her injury affected her energy level and her feelings of frustration and stress:

> Not being able to do the things that I want to do without having to think about it has been frustrating and I think for me that being able to exercise regularly has always been helpful in terms of managing my stress but also providing me energy to do other things. As a result of not being able to have my normal routine, I am a slug. The less I do, the less I want to do so I always feel tired because of the lack of sound sleep [and] the lack of exercise beyond walking and elliptical machines. For me it's a control issue and not being able to do what I want to do.

Altered Relationships. Social support is an important part of the injury-recovery process, being positively correlated with emotional adjustment and adherence to rehabilitation.[8,27,57] Therefore, any perceived changes in the social support system via teammates, parents, or coaches were a large concern for participants in this study. Participants with acute injuries and problems with mobility said that their relationships with friends and teammates were affected because of the difficulty of "getting around." Will explained his difficulty by saying, "It seems like a lot of the team goes out and hangs out and I don't want to even put up with going out …. I have to carry the crutches around so I'm not motivated to get out." On some occasions, individuals felt that they were ostracized from the group because they were not fully able to participate in daily activities such as practice or team outings. These perceptions were heightened in the cases of the participants who were totally removed from practice situations. Lucy portrayed the change in relationships as "one of the worst things that I had to deal with in the surgery." She went on to elaborate that she felt this way because of how her interactions with the team changed, saying "the team doesn't really talk to me anymore."

Disablement Model

We used the IOM model for the conceptual framework for this study, and the current model (Figure 4) is categorized into the larger disablement themes (IMP, FL, DIS, and QOL), with the corresponding descriptive themes subsumed into each of the disablement concepts. We believe that current sociomedical disablement models apply to the participants in this study. This model depicts disablement as ripples in water to emphasize the sequential and recursive nature of each of the disablement components.

The disablement process starts in the center with a musculoskeletal injury, which sets the model into motion. The IMPs, FLs, DISs, and QOL themes are found in the subsequent ripples. This model illustrates the recursive nature of the disablement process: the effects of the disablement components act as ripples that overlap and move back upon each other. Thus, the model is consistent

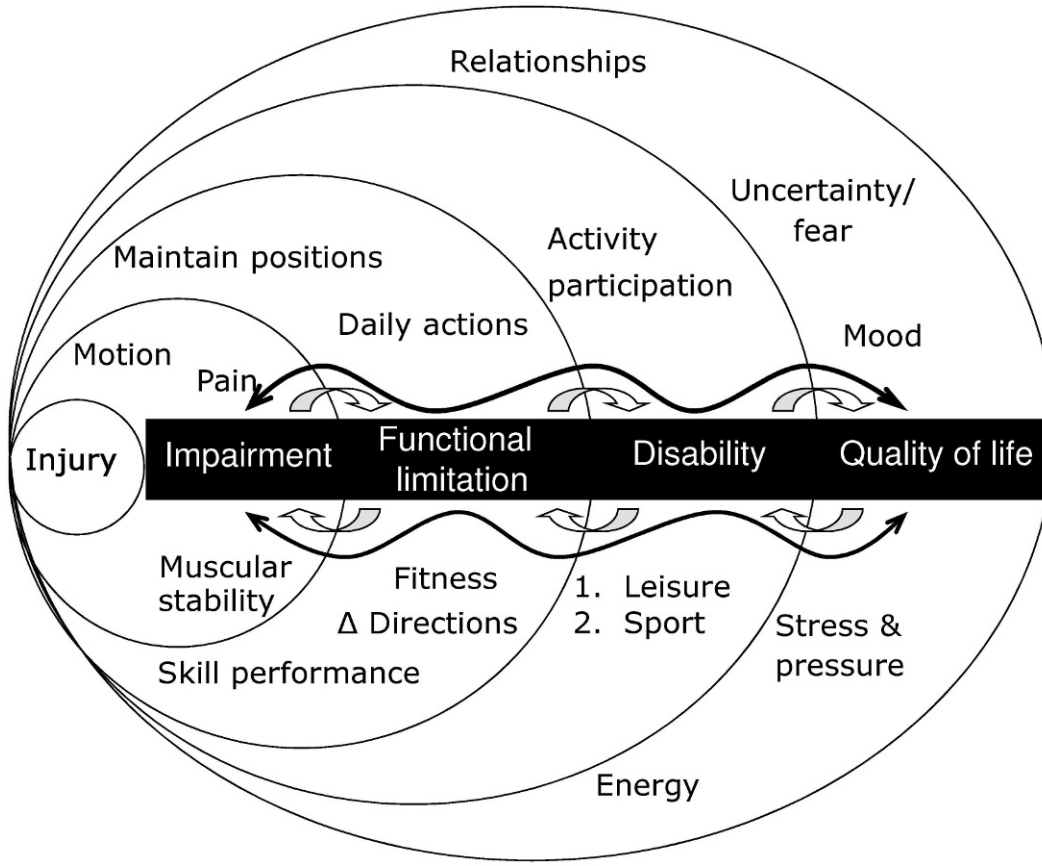

Figure 4. Disablement model and themes.

with the theory that disablement components have a cyclical character.[12]

In addition, the model also represents the progression from an injury that affects a localized structure to the more global effects of an injury, such as changes in QOL. Another difference from other disablement models is our placement of QOL as the last component, because it is the broadest disablement component. This placement emphasizes that QOL is affected by all the disablement components and not just by portions of the process.

The descriptive themes and common descriptors for each theme were transformed into items for a generic, multidimensional outcomes tool intended to be used with patients with musculoskeletal injury (Figure 5). The themes are broad and consistent enough that the same tool can be used in patients with a variety of injuries. More importantly, the items in the instrument are clinically meaningful to the patient and use the common language and descriptors that the participants in this study used. Each item is a descriptive theme that emerged from this study, with common descriptors of each theme included to clarify the theme for the patient. We will test the instrument's validity, reliability, scale structure, and sensitivity to change in injured, physically active patients.

IMPLICATIONS

The disablement limitations that participants experience after musculoskeletal injury are far ranging. Pain was the most common limitation, but participants were equally concerned with limitation in actions, activities, and overall QOL. Furthermore, limitations extended beyond the realm of sport and physical activity, affecting activities of daily living, leisure activities, and QOL as well.

Both athletic training clinicians and researchers can benefit from understanding the experience of a physically active patient undergoing disablement. The disablement experience is predicated on a patient's values, roles, and expectations. Thus, the disablement experienced by each person is unique. Part of understanding patient values includes understanding how a patient is affected by the disablement process, which, in turn, affects the way in which care is administered.

By understanding disablement, clinicians and researchers alike can then measure the important patient outcomes that ascertain true treatment success. The descriptive themes developed in this study are clinically meaningful to competitive and recreational athletes. Therefore, the items are appropriate variables for measuring the disabling effects of injury and the clinical change resulting from an intervention provided by a health care practitioner.

LIMITATIONS

We selected the IOM model because of its clearly defined distinctions between 2 constructs in the model and the inclusion of QOL as a dimension of disablement.[13] Since the time during which this research was conducted, the physical therapy profession has adopted the World Health Organization's disablement model—the International Classification of Functioning, Disability and Health.[58] Future researchers of disablement should consider the use of this

Disablement in the Physically Active Scale©

Instructions: Please answer **each statement** with one response by shading the circle that most closely describes your problem(s) within the past **24 hours.** Each problem has possible descriptors under each. Not all descriptors may apply to you but are given as common examples.

KEY

1 - no problem
2 - I have the problem(s), but it does not affect me
3 - The problem(s) slightly affects me
4 - The problem(s) moderately affects me
5 - The problem(s) severely affects me

	No problem	Does not affect	Slight	Moderate	Severe
	1	**2**	**3**	**4**	**5**
Pain – *"Do I have **pain**?"*	O	O	O	O	O
Motion – *"Do I have impaired **motion**?"* **Ex.** decreased range/ease of motion, flexibility, and/or increased stiffness	O	O	O	O	O
Muscular Functioning – *"Do I have impaired **muscle function**?"* **Ex.** decreased strength, power, endurance, and/or increased fatigue	O	O	O	O	O
Stability – *"Do I have impaired **stability**?"* **Ex**. the injured area feels loose, gives out, or gives way	O	O	O	O	O
Changing Directions – *"Do I have difficulty with **changing directions** in activity?"* **Ex.** twisting, turning, starting/stopping, cutting, pivoting	O	O	O	O	O
Daily Actions – *"Do I have difficulty with **daily actions** that I would normally do?"* **Ex**. walking, squatting, getting up, lifting, carrying, bending over, reaching, and going up/down stairs	O	O	O	O	O
Maintaining Positions – *"Do I have difficulty **maintaining the same position** for a long period of time?"* **Ex.** standing, sitting, keeping the arm overhead, or sleeping	O	O	O	O	O
Skill Performance – *"Do I have difficulties with **performing skills** that are required for physical activity?"*					
1.) **Ex**. running, jumping, kicking, throwing, & catching	O	O	O	O	O
2.) **Ex.** coordination, agility, precision & balance	O	O	O	O	O
Overall Fitness – *"Do I have difficulty maintaining my **fitness** level?"* **Ex**. conditioning, weight lifting & cardiovascular endurance	O	O	O	O	O
Participation in Activities – *"Do I have difficulty with **participating in activities**?"*					
1.) **Ex**. participating in leisure activities, hobbies, and games	O	O	O	O	O
2.) **Ex.** participating in my sport(s) of preference	O	O	O	O	O
Well Being – *"Do I have difficulties with the following…?"*					
1.) Increased uncertainty, stress, pressure, and/or anxiety	O	O	O	O	O
2.) Altered relationships with team, friends, and/or colleagues	O	O	O	O	O
3.) Decreased overall energy	O	O	O	O	O
4.) Changes in my mood and/or increased frustration	O	O	O	O	O

Figure 5. Disablement in the Physically Active Scale.

model to ensure consistency of language within athletic training and among the health care professions.

This study represents the first step toward understanding the disablement process in the physically active and was limited in its use of traditional qualitative methods. Additional work needs to be done to understand the complex relationships between and among disablement components and to determine if differences exist among different subsets of the injured physically active. Additionally, grounded theory and phenomenology methods could be used to fully disclose the disablement experience in physically active persons. Specifically, more research can be based on level of participation, ethnicity, age, and injury type. Instead, we used a mixed-methods approach, which involved presenting participants with a list of IMPs, FLs, DISs, and QOL terms before the qualitative interviews to quantitatively establish the limitations the participants were experiencing.

CONCLUSIONS

This study is the first step in understanding disablement in the physically active. We identified key descriptive themes in each of the 4 disablement components: 4 IMPs, 5 FLs, 1 DIS limitation, and 5 QOL changes. Our desire is to elucidate the disablement process so that clinicians will more carefully consider the clinical variables they measure. In addition, we anticipate that athletic training, as a field, will work diligently toward integrating a disablement model into the context of clinical research. More research is needed for us to fully understand the disablement process and the relationships between and among the disablement components. Ultimately, appropriate outcomes tools based on the disablement themes identified in this study need to be validated to assess the effects of interventions on the treatment of musculoskeletal injuries in the physically active.

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Appendix Interview Guide

Read prior to beginning interview:

The following interview as mentioned when you signed your informed consent is to find out more information about your current injury. Please be as truthful as possible as you answer each of the questions. Please be sure to speak clearly since we are audio taping this interview. I would also like to remind you that you may refuse to answer any questions that you choose. If you have any questions that come to mind during the interview please feel free to ask them.

This interview is broken up into four sections. We will start with problems that you have right at the area of injury and gradually work up to problems that you have with everyday life as a result of your injury.

Do you have any questions before we get started?

Impairments

I am interested in finding out about the problems that you have had at (enter site of your injury) from your injury. For example, my ankle sprain has caused me to lose muscle strength around my ankle…and elaborate.

- *I will turn over a sheet of paper with a list of terms.*

1. *Do you presently have problems or have you noted negative changes with any of the following terms* (show impairment list)? *I would like to find out more information about the quality of the impairments that you have chosen. Can you please describe the way in which each is affected? Please use descriptive words, or phrases, that you feel apply to your current injury. Include timeframes as well.*
   a. *Are there any additional ways that you would describe the problems that you have had at the site of your injury that is not included in this list?*
2. Two part question
   a. *Are you confused by the possible meaning of any of the terms listed? If you found the term confusing circle the letter "C" next to each item on the right hand side.*
   b. *Please give your best definition for each of the words that you chose as confusing.*

Prompt: What does this word mean to you? If you are not sure how to define the word you may use an example.

Functional Limitations

I am interested in finding out about the problems that you have doing basic actions because of your (enter site of your injury) injury. For example, my arm pain has made it difficult to roll over while I am sleeping…elaborate.

- *I will turn over a sheet of paper with a list of terms.*

1. *Do you presently have problems or have you noted negative changes with the following* (show functional limitation list)? *I would like to find out more information about the quality of the functional limitations that you have chosen. Can you please describe the way in which each is affected? Please use descriptive words, or phrases, that you feel apply to your current injury. Include timeframes as well.*
   a. *Are there any additional ways that you would describe the problems that you have had with actions that is not included in this list?*
2. Two part question
   a. *Are you confused by the possible meaning of any of the terms listed? If you found the term confusing circle the letter "C" next to each item on the right hand side.*
   b. *Please give your best definition for each of the words that you chose as confusing.*

Prompt: What does this word mean to you? If you are not sure how to define the word you may use an example.

Disability

I am interested in finding out about how your (enter site of your injury) injury as affected your ability to do activities that you would normally do. For example, my injury has limited my ability to drive so I have difficulties with transportation to and from work…elaborate.

- *I will turn over a sheet of paper with a list of terms.*

1. *Do you presently have problems or have you noted negative changes with the following* (show disability list)? *I would like to find out more information about the quality of the disabilities that you have chosen. Can you please describe the way in which each is affected? Please use descriptive words, or phrases, that you feel apply to your current injury. Include timeframes as well.*
   a. *Are there any additional ways that you would describe the problems that you have had with activities that are not included in this list?*
2. Two part question
   a. *Are you confused by the possible meaning of any of the terms listed? If you found the term confusing circle the letter ''C'' next to each item on the right hand side.*
   b. *Please give your best definition for each of the words that you chose as confusing.*

Quality of Life

We will now talk about your injury and quality of life. If at any time you are not comfortable with me audio taping your responses please let me know. I will turn off the recorder if you like. I would like to remind you that anything you say will be kept confidential.

I am interested in finding out about how your injury has affected your quality of life. I would like to know how your injury affected the factors that contribute to the goodness and meaning of your life. For example, my self-esteem suffers when I see other people being physically active… elaborate.

- *I will turn over a sheet of paper with a list of terms.*

1. *Do you presently have problems or have you noted negative changes with the following* (show quality of life list)? *I would like to find out more information about the quality of life terms that you have chosen. Can you please briefly describe the way in which each is affected? Please use descriptive words, or phrases, that you feel apply to your current injury. Include timeframes as well.*
   a. *Are there any additional ways that you would describe the problems that you have had with quality of life that are not included in this list?*
2. Two part question
   a. *Are you confused by the possible meaning of any of the terms listed? If you found the term confusing circle the letter ''C'' next to each item on the right hand side.*
   b. *Please give your best definition for each of the words that you chose as confusing.*

Terms List

Impairments – an impairments refers to loss or abnormality at the site of the injury

Pain	Muscle tone	Giving way
Swelling	Flexibility	Mobility
Movement range	Fatigue	Dexterity
Strength	Power	Coordination
Weakness	Deformity	Balance
Endurance	Stability	Numbness
Movement speed	Stiffness	Tingling
Movement ease	Buckling	Burning

Functional Limitations – restrictions in performance of actions at the level of the whole person

Desk job	Feeding yourself	Throwing
Labor job	Opening doors	Walking
Hard labor job	Writing	Twisting
Sleeping	Gripping	Turning
Dressing	Housework	Lavatory (toilet)
Grooming	Coordination	Preparing a meal
Carrying	Balance	School work
Lifting	Pinching	Crawling
Reaching	Running	Cardiovascular fitness
Driving	Jumping	Sitting
		Standing
		Laying down

Disability- inability to complete daily activities that you would normally do, or are expected to do in your environment

Social interaction	Leisure activities	Social relationships
Team interaction	Hobbies	Transportation
Desk job	Traveling	Family involvement
Labor job	School activities	Studying
Hard labor job	Parenting	Relationships with friends
Housework	Professional interaction	Cardiovascular fitness
Meal preparation	Chores	Sports

Quality of Life – the quality of factors that contribute to the goodness and meaning of life

Emotional well being	Hobbies	Housing conditions
Sleep	Spiritual activities	Transportation
Rest	Finances	Self-esteem
Vitality	Volunteer activities	Mental health
General life satisfaction	Professional/ career activities	Appetite
Mood	Learning/school activities	Energy
Mentality	Family involvement	Fatigue
Social interaction	Stress	Concentration
Recreational activities	Pressure	Self-control
Personal relationships	Control of life	Anxiety

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