Identifying Meaningful Patient Outcomes After Lower Extremity Injury, Part 2: Linking Outcomes to the International Classification of Functioning, Disability and Health

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Context: The International Classification of Functioning, Disability and Health (ICF) provides a framework and common language for describing and understanding health that incorporates function and disability, as well as contextual factors. However, whether the meaningful patient outcomes reported by collegiate athletes who have sustained a lower extremity (LE) injury correspond to the ICF model is uncertain.

Objectives: To determine if the patient outcomes reported by collegiate athletes after LE injury corresponded with the ICF classification and to identify the most relevant ICF categories and domains.

Design: Themes and subthemes from the qualitative analysis were linked to the ICF using established linking rules. The frequencies of the linked ICF categories were identified.

Setting: University laboratory.

Patients or Other Participants: Twenty collegiate athletes (10 men, 10 women; age = 20.1 ± 1.83 years) from a National Collegiate Athletic Association Division I institution in the Midwest who had sustained an LE injury.

Data Collection and Analysis: Semistructured face-to-face interviews and ICF linking process.

Results: The data from the qualitative interviews were successfully linked to 63 ICF second-level domains (eg, *moving around*, d455) across all 4 ICF categories: *body functions* (b), *body structures* (s), *activities and participation* (d), and *environmental factors* (e). The 63 second-level domains corresponded with 20 first-level domains (eg, *mobility*, d4).

Conclusions: The ICF provided a common language for describing health and disability, as all outcomes reported by our collegiate athletes after LE injury were linked with the ICF classification. Athletic trainers should use the results of this study for assessing and monitoring collegiate athletes' health and function after an LE injury.

Key Words: disablement model, World Health Organization (WHO)

Key Points

- The characteristics of health and function described by collegiate athletes recovering from lower extremity injuries matched the standard language of the International Classification of Functioning, Disability and Health (ICF).
- The meaningful outcomes described by participants were linked to 63 ICF second-level domains and 20 corresponding first-level domains across all 4 ICF categories.
- It appears the ICF can serve as a universal standard for identifying and assessing impairments, limitations, and restrictions in athletic training patients recovering from lower extremity injury.

he athletic patient population has been deemed unique in that it typically represents higher levels of physical abilities than those of the general population.¹ In addition to exhibiting higher levels of physical abilities, psychological and social well-being elements have also been uniquely categorized by these patients.² Whereas the general population may view their level of health in terms of their ability to complete everyday activities, such as dressing, walking, climbing stairs, and driving, the athletic population may determine their level of health from an athletic perspective. Optimal health for the athletic patient population often includes the ability to perform highly demanding athletic skills, such as cutting, sprinting, and quickly changing directions.³ Thus, many common patient-reported outcome instruments used to measure health fail to capture the athletic patient population's high-level abilities. Because of a ceiling effect, his or her health status as reflected by these instruments may not be accurate, offering less value to the patient or clinician.⁴ Furthermore, for outcomes assessment to have practical value in a health care discipline and improve patient care, the outcomes measured must reflect the aspects of health that are meaningful to the patient.^{5–7}

Specific to the athletic patient population, authors of epidemiology studies^{8–10} reported that lower extremity (LE) musculoskeletal injuries accounted for the majority of injuries sustained by this population. An LE injury affects the hip, groin, thigh, knee, shank, ankle, foot, or toes.¹⁰



Figure 1. The model basis for the International Classification of Functioning, Disability and Health (World Health Organization, 2002).¹²

According to the World Health Organization (WHO), musculoskeletal conditions "encompass a spectrum of conditions, from those of acute onset and short duration to lifelong disorders."¹¹ Musculoskeletal injury has the potential to affect many facets of life, including physical and emotional wellbeing. The impairments and limitations resulting from musculoskeletal injury vary depending on the specific condition and patient.

Medical attention and treatment for LE injuries are often provided by a team of health care professionals. Optimal management requires the medical team to have a standardized language, enabling communication about patients' health, disability, and functioning across various disciplines.¹² Furthermore, health outcomes assessed by the medical team must account for all dimensions of health, including physical, psychological, and social well-being.¹³ The adoption of the WHO's International Classification of Functioning, Disability and Health (ICF) has facilitated such efforts in health care. The ICF is the official standard defining and quantifying health and disability.¹² Endorsed by the Athletic Training Strategic Alliance, the ICF should be used by the athletic training profession for delivery of and communication about patient care.¹⁴ The ICF (Figure 1) classifies health, disability, and functioning according to impairments of body functions and structure, activity limitations, participation restrictions, and personal and environmental factors.12

The ICF framework is built on a hierarchical structure for implementation in common practice and consists of 4 components, each represented by an alphabetical coding system: *body functions* (b), *body structures* (s), *activities and participation* (d), and *environmental factors* (e). Each component is further divided into domains (up to 4 levels), represented by alphanumeric codes.¹² One digit denotes a first-level domain (eg, *mental functions*, b1), 3 digits denote second-level domains (eg, *sensation of pain*, b280); 4 digits, third-level domains (eg, *pain in body part*, b2801); and 5 digits, fourth-level domains (eg, *pain in lower limb*, b28015). Fourth-level domains identify more precise impairments, limitations, or restrictions, whereas first-level domains capture function and disability from a broad perspective. The ICF system is illustrated in Figure 2.

The ICF has been applied to several patient populations, conditions, and health care professions. To date, no researchers have used the ICF as a framework for capturing the athletic patient population's health and disability, which would contribute to understanding the usefulness of the ICF among athletic trainers (ATs). Whether the patient outcomes reported by collegiate athletes who have sustained an LE injury correspond to the ICF model is unknown. Therefore, the purposes of our study were to (1) determine if the patient outcomes reported by collegiate athletes after LE injury corresponded with the ICF system and (2) identify the most relevant ICF categories and domains for collegiate athletes after LE injury.

METHODS

The first phase of our study¹⁵ involved conducting semistructured, face-to-face interviews with collegiate athletes to explore their experiences and meaningful outcomes after LE musculoskeletal injury. General inductive analysis allowed us to identify the themes and personal experiences that were meaningful to the patients. In the second phase, reported here, the data, systematically indexed by themes and subthemes, were linked to ICF second-level domains using established linking rules.¹⁶

Participants

Purposive sampling¹⁷ was used to recruit participants. Participants were National Collegiate Athletic Association Division I athletes who received care from an AT after sustaining at least 1 LE musculoskeletal injury within the past calendar year. Participants were included in the study if (1) the injury resulted in at least 1 lost day (24 hours) of competition, practice, or conditioning from their sport and (2) they were recovered or in the end phase of recovery from the LE injury. Recovery status was based on the individual's current athletic participation status. To meet the inclusion criteria and be classified as recovered or in the end phase of recovery, participants had to be cleared for activity (full or limited) in their sport by a health care professional. More specifically, the person was allowed to participate in some sort of team-related activity that was sport specific but need not have fully returned to participation. This allowed the athletes to be able to discuss how the injury affected them through each phase of recovery. Although participation status may not serve as the most accurate qualifier for identifying recovery status among the general population, it is an identifiable and measurable qualifier for the athletic patient population. Injury severity was determined by self-reported time lost from athletic participation. Any injury that resulted in a loss of greater than 3 weeks of sports participation was categorized as a *severe injury*.^{18,19} A *moderate injury* was defined as any injury that resulted in participation restriction of greater than 1 day and less than 3 weeks.^{18,19} We interviewed 20 participants (10 men, 10 women; mean age = 20.1 ± 1.83 years; 10 severely injured, 10 moderately injured) before data saturation was achieved. Additional demographic information was presented in Part 1.¹⁵



Figure 2. Example of the components, domains, and codes in the International Classification of Functioning, Disability and Health classification system.

The ICF Linking Process

The meaningful concepts that were derived from the interviews as qualitative data were linked to second-level ICF categories by 2 independent researchers. The linking rules involved 3 steps: (1) develop an understanding of the



Figure 3. Proportion of International Classification of Functioning, Disability and Health second-level domains in each category that were linked to the qualitative interviews.

ICF categories and domains, (2) link each meaningful concept derived from the data to the most similar ICF second-level domain or domains,¹⁶ and (3) compare and discuss the researchers' independently linked concepts to ensure agreement.²⁰ A third researcher was available in the case of ambiguity; however, no disagreements occurred. In some instances, the data were linked to more than 1 second-level domain and, therefore, potentially to more than 1 first-level domain and ICF category. For example, the following statement was categorized under the 3 second-level domains *attention functions* (b140), *focusing attention* (d160), and *maintaining a body position* (d415):

It rearranged your focus, like sitting in class for 2 hours and your foot would be throbbing . . . You'd lose track of the topic and start thinking about your foot and try to figure out what's on the board.

It was also linked to the first-level domain *mental function* (b1) under the category *body function* (b), as well as the first-level domains *learning and applying knowledge* (d1) and *mobility* (d4) under the category *activities and participation* (d).

RESULTS

The data from the qualitative interviews were successfully linked to 63 ICF second-level domains across all 4 categories (Figure 3). These second-level domains corresponded with 20 first-level domains (Table). The results are presented in the Appendix, including participant quotes and



Figure 4. The number of participants who were linked to the 20 second-level domains and 6 corresponding first-level domains specific to body functions.

the terms that were linked to the ICF second-level domains. Affiliated with *body functions* (b), 20 second-level domains were linked to participant interviews. The 20 second-level domains fell under 6 first-level domains (Figure 4). Under the *activities and participation* (d) classification, 28 second-level domains and 7 corresponding first-level domains were linked to participant responses (Figure 5). We linked 12 second-level domains under *environmental factors* (e) to the participant interviews. These corresponded to 5 first-level domains (Figure 6). Three second-level domains were linked to participant interviews under *body structures* (s) that corresponded with 2 first-level domains (Figure 7).

DISCUSSION

This appears to be the first attempt to investigate the health and disability of collegiate athletes with LE injuries in the context of the WHO's ICF model. The ICF has been adopted internationally as a standard language for describing and categorizing health.²¹ Therefore, using the ICF as a consistent language to communicate health status among the members of the medical team is paramount to ensure

standardization across health care disciplines and geographic regions. Participant responses in this study were linked to 63 ICF second-level domains and categorized under 20 of the 30 first-level domains. Important insights from the interviews contribute to and enhance our existing knowledge regarding outcomes assessment.

Most responses were easily linked to the ICF. For example, several participants discussed having difficulties sleeping, which could easily be connected to the ICF second-level domain sleep functions (b134). Conversely, some concepts that emerged from the data were not easily classifiable. For example, respondents discussed their discontent with relying on others and identified gaining independence as an important milestone in recovery and a marker of health. However, gaining independence was more difficult to link to first- or second-level domains because the responses were more specifically aligned to third- or fourth-level domains. Nonetheless, the general meaning of the participants' responses could be captured using the broader second-level domains. Responses in the current study that referred to gaining independence were linked to the second-level domain *undertaking a single task*

Activities and Participation (d)



Figure 5. The number of participants who were linked to the 28 second-level domains and 7 corresponding first-level domains specific to activities and participation.

(d210) or *undertaking multiple tasks* (d220), as performing tasks independently is tied to these domains.

The ability to use stairs was another common activity limitation, yet the term *stairs* is not specifically cited in the ICF. Similarly, many sport-specific movements or tasks are not explicitly acknowledged in the ICF, such as cutting, pivoting, drilling in wrestling, and reaching top end speed. The ICF practical manual stated: "Disability-related information generated independently of the ICF model and classification may or may not be easily linked to individual categories or codes on a one-to-one basis."^{21(p44)} The manual refers to the Cieza et al¹⁶ linking rules for organizing and classifying information. According to Cieza et al,¹⁶ "Each meaningful concept is linked to the most precise ICF category."

Previous researchers have successfully linked the ICF to various conditions, including hip osteoarthritis,²² neck pain,²³ plantar fasciitis,²⁴ meniscal and articular cartilage



Environmental Factors (e)

Figure 6. The number of participants who were linked to the 12 second-level domains and 5 corresponding first-level domains specific to environmental factors.



Figure 7. The number of participants who were linked to the 3 second-level domains and 2 corresponding first-level domains specific to body structures.

lesions,²⁵ and neurodisability.²⁶ Other investigators have explored broader contexts by identifying functioning and health as they relate the ICF to larger patient populations with unique characteristics, including geriatric patients²⁷ and children and youths.²⁸ Using the ICF to categorize health and functioning allows clinicians to identify evidence-based interventions to address impairments of body functions and structures, activity limitations, and participation restrictions. Also, it enables clinicians to properly assess changes in health status by identifying appropriate outcome measures that encompass all components of functioning and health.

Our results provide the foundation for confirming that the ICF model is suitable for the athletic population. All outcomes identified by the participants fit in the ICF. However, our focus was solely on LE musculoskeletal injury; therefore, it is important to explore the upper extremity, head and neck, and trunk. An outcome

Table.	Results: Inter	national Cla	ssification	of Functioning,
Disabili	ty and Health (ICF) First-L	evel Domai	nsª

	N	0.
ICF First-Level Domain	Participants	Responses
Mobility d4	20	108
Neuromusculoskeletal and movement-		
related functions b7	20	92
Mental functions b1	20	65
General tasks and demands d2	20	58
Sensory functions and pain b2	20	25
Community, social, and civic life d9	20	22
Structures related to movement s7	20	20
Support and relationships e3	12	52
Products and technology e1	10	19
Functions of the cardiovascular,		
hematological, immunological and		
respiratory systems b4	10	10
Services, systems, and policies e5	8	8
Self-care d5	7	16
Attitudes e4	4	7
Domestic life d6	4	7
Functions of the digestive, metabolic and		
endocrine systems b5	4	4
Major life areas d8	2	12
Functions of the skin b8	1	2
Skin and related structures s8	1	1
Learning and applying knowledge d1	1	1
Natural environment and human-made		
changes to environment e2	1	1

^a This table displays the ICF first-level domains, corresponding responses, and number of participants who identified at least 1 response linked to each first-level domain.

instrument that encompasses health outcomes significant to athletic patients should also be identified. Specifically, the 63 second-level domains described by the athletes could represent the first step in creating an outcome instrument based on the ICF model. Identifying meaningful outcomes represents one of the rudimentary yet crucial steps for the genesis and validation of an outcome instrument.

Determining meaningful patient outcomes is a foundational component of providing patient-centered care, so our results have direct clinical and research applications. From a clinical perspective, our findings should prompt ATs to embrace the concepts provided in the ICF. Considering that all of the outcomes described by the athletes fit under the conceptual umbrella of the ICF, this offers a clinical compass for ATs to identify and subsequently document and track their patients' outcomes. Furthermore, even if an outcomes instrument addressing all of these constructs does not exist, ATs can and should ask these questions of their patients in their assessments and daily patient interactions and then document and monitor changes as the patient recovers. From a research perspective, now that we have this clinical compass pointing us toward the concepts of function and disability that are deemed important to our recovering patients, what we should be measuring is clear as we attempt to determine the value of athletic training services. For example, any investigation into athletic training outcomes that considers only physical limitations and ignores the mental, social, and environmental factors associated with patient recovery will be limited in scope and influence. Furthermore, our work provides insight into the constructs of health and function that must be included in any instrument that is to be used in, or developed for, athletic training clientele.

The creation of a new instrument may be justified; however, the possibility that the ICF domains acknowledged in this study are addressed in previously validated instruments should be explored. Investigations should include the ICF-based instruments developed by the WHO, including the ICF Checklist,²⁹ the WHO Disability Assessment Schedule 2.0,³⁰ and the ICF Core Sets.³¹ Several outcomes identified in this study, such as pain, mobility, self-care, and major life areas, are commonly assessed among the general population using instruments such as the 36-item Short-Form Health Survey.³ These common dimensions of health are just as meaningful to the athletic population and must be measured using an appropriate outcome instrument. Similarly, unique aspects of health, such as the sport-specific skills described by participants in this study, must be taken into account when seeking an adequate outcome instrument.

It is also important to attain a consensus or shared vision among patients and health care professionals regarding the core aspects of health that are of primary concern. Future researchers should determine and attain consensus on what health care professionals regard as meaningful for outcomes assessment.

CONCLUSIONS

The functioning described by athletic training patients recovering from LE injuries matched the standard language of the ICF. The meaningful outcomes they described were successfully linked to 63 ICF second-level domains and 20 corresponding first-level domains that spanned all 4 of the ICF categories. Since the endorsement of the ICF by the Athletic Training Strategic Alliance, this is the first step in understanding and applying the ICF to the athletic training discipline. Our results confirm that the ICF serves as a universal standard to identify and assess impairments, limitations, and restrictions among various patient populations, including athletes after LE injury. Furthermore, ATs now have a clear pathway for identifying and documenting their patients' outcomes. Even if an ideal instrument does not exist, clinicians can still address these constructs in their assessments and daily patient interactions. It is essential for ATs to incorporate these universally accepted health outcomes in order to deliver patient-centered care.

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Appendix. Results^a Continued on Next Page

ICF Component	ICF Definition and Inclusions	Participant Quote
Body functions (b) Mental functions (b1)	Physiological functions of body systems. Functions of the brain.	
Temperament, personality functions (b126)	General mental functions of constitutional disposition of the individual to react in a particular way to situations, including the set of mental characteristics that makes the individual distinct from others. Inclusions: functions of extraversion, introversion, agreeableness, conscientiousness, psychic and emotional stability, and openness to experience ; optimism ; novelty seeking; confidence; trustworthiness	"Mentally, I think it sucks sitting there for that long watching games and practice, and not traveling when you're used to doing that. It kind of makes you hate it ; it's like, ok, I'm over this; I want it to be done. But when I can jump in and do things, I'm like, I love this."
Energy and drive functions (b130) Sleep functions (b134) Attention functions (b140) Emptional functions (b152)		
Sensory functions and pain	Functions of the senses, seeing, hearing, tasting, and so	
(b2) Touch function (b265)	on, as well as the sensation of pain. Sensory functions of sensing surfaces and their texture or quality. Inclusions: functions of touching, feeling of touch; impairments such as numbness, anesthesia, tingling, naresthesia, and hyperesthesia	"I definitely got more sensitive to shoes. I found that shoes really rubbed on my Achilles tendon, regardless of what type of shoe I just got hypersensitive to anything in that area."
Sensory functions related to temperature and other stimuli (b270)		
Functions of the cardiovascular, hematological, immunological, and respiratory systems (b4)	Functions involved in the cardiovascular system (functions of the heart and blood vessels), the hematological and immunological systems (functions of blood production and immunity), and the respiratory system (functions of respiration and exercise tolerance).	
Exercise tolerance functions (b455)	Functions related to respiratory and cardiovascular capacity as required for enduring physical exertion. Inclusions: functions of physical endurance, aerobic capacity, stamina , and fatiguability	"My stamina wasn't to par. That could happen from a day off though. It's crazy how that works. I realized it when we started drilling hard. I was like, I'm getting tired pretty quick and I should not be."
Functions of the digestive, metabolic, and endocrine systems (b5)	Functions of ingestion, digestion and elimination, as well as functions involved in metabolism and the endocrine glands.	
Weight maintenance functions (b530)	Functions of maintaining appropriate body weight, including weight gain during the developmental period. Inclusions: functions of maintenance of acceptable body mass index (BMI) and impairments such as underweight, cachexia, wasting, overweight , emaciation, and such as in primary and secondary obesity	"One of the things that was a problem for me was that I put on too much weight . And so I had lost 15 pounds when I was able to start moving around more and exercising more without experiencing soreness. And getting back to where I wanted to be and best fit for my body to move around and stuff."
Neuromusculoskeletal and movement-related functions (b7) Mobility of joint functions (b710) Stability of joint functions (b715)	Functions of movement and mobility, including functions of joints, bones, reflexes, and muscles.	
Muscle power functions (b730)	Functions related to the force generated by the contraction of a muscle or muscle groups. Inclusions: functions associated with the power of specific muscles and muscle groups, muscles of one limb , one side of the body, the lower half of the body, all limbs, the trunk and the body as a whole; impairments such as weakness of small muscles in feet and hands, muscle paresis, muscle paralysis, monoplegia, hemiplegia, paraplegia, quadriplegia, and akinetic mutism	"It was really hard to push off with my right foot at all."

ICF Component	ICF Definition and Inclusions	Participant Quote
Muscle endurance functions (b740) Involuntary movement reaction functions (b755) Control of voluntary movement functions (b760) Gait pattern functions (b770) Sensations related to muscles and movement functions (b780) Euroctions of the skin and	Functions of skin, nails and hair	
related structures (b8) Protective functions of the skin (b810)		
Sensation related to the skin (b840)	Sensations related to the skin such as itching , burning sensation, and tingling. Inclusions: impairments such as pins and needles sensation and crawling sensation	"I have really sensitive skinthe adhesive stuff they used, I started developing a rash. It was terrible. It started oozingI was basically in tears it was itching so bad."
Activities and participation (d)	Activity is the execution of a task or action by an individual. Participation is involvement in a life situation.	
knowledge (d1)	solving problems, and making decisions.	
Focusing attention (d160)	Intentionally focusing on specific stimuli, such as by filtering out distracting noises.	"It rearranged your focus , sitting in a 2 hour class and your foot would be throbbing, I would lose track of the topic and start thinking about my foot. And then have to try to figure out what's on the board "
General tasks and demands (d2)	General aspects of carrying out single or multiple tasks, organizing routines, and handling stress. These items can be used in conjunction with more specific tasks or actions to identify the underlying features of the execution of tasks under different circumstances.	
Undertaking a single task		
(d210) Undertaking multiple tasks (d220)		
Carrying out daily routine (d230)	Carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties, such as budgeting time and making plans for separate activities throughout the day. Inclusions: managing and completing the daily routine : managing one's own activity level	"I couldn't really do anything. I had to just sit around the house."
Handling stress and other psychological demands (d240)		
Mobility (d4)	Moving by changing body position or location or by transferring from one place to another, by carrying, moving, or manipulating objects; by walking, running, or climbing; and by using various forms of transportation.	
Changing basic body		
Maintaining a body position (d415)	Staying in the same body position as required, such as remaining seated or remaining standing for carrying out a task, in play, work, or school. Inclusions: maintaining a lying, squatting, kneeling, sitting , and standing position	"One thing that stood out was sitting in classessitting down for a while; I'd want to stand up in a big lecture hall and stretch. And I had to."

CF Component	ICF Definition and Inclusions	Participant Quote
Lifting and carrying objects (d430) Moving objects with lower extremities (d435) Walking (d450) Moving around (d455) Moving around in different locations (d460) Moving around using equipment (d465) Using transportation (d470) Driving (d475) Self-care (d5)	Caring for oneself, washing and drying oneself, caring for one's body and body parts, dressing, eating and	
Washing oneself (d510)	drinking, and looking after one's health. Washing and drying one's whole body, or body parts, using water and appropriate cleaning and drying materials or methods, such as bathing, showering , washing hands and feet, face, and hair, and drying with a towel. Inclusions: washing body parts, the whole body, and drying oneself	"I couldn't shower by myself. My mom did it"
Toileting (d530) Dressing (d540) Looking after one's health (d570)		
Domestic life (d6)	Carrying out domestic and everyday actions and tasks. Areas of domestic life include caring for one's belongings and space, acquiring food, clothing and other necessities, household cleaning and repairing, caring for personal and other household objects, and assisting others.	
Preparing meals (d630) Doing housework (d640)	Managing a household by cleaning the house, washing clothes , using household appliances, storing food, and disposing of garbage, such as by sweeping, mopping, washing counters, walls, and other surfaces; collecting and disposing of household garbage; tidying rooms, closets, and drawers; collecting, washing, drying, folding, and ironing clothes; cleaning footwear; using brooms, brushes, and vacuum cleaners; using washing machines, dryers, and irons. Inclusions: washing and drying clothes and garments; cleaning cooking area and utensils; cleaning living area; using household appliances, storing daily necessities and disposing of garbage	"I had to get my roommate to do my laundry for me."
Caring for household objects (d650)		
Major life areas (d8)	Carrying out the tasks and actions required to engage in education, work, and employment and to conduct economic transactions.	
School education (d820) Higher education (d830)	Engaging in the activities of advanced educational programs in universities, colleges, and professional schools and learning all aspects of the curriculum required for degrees, diplomas, certificates, and other accreditations, such as completing a university bachelor's or master's course of study, medical school, or other professional school	"Right after [my injury]I had 2 or 3 tests and those were my last tests in those classes so my grades dropped immensely from that. I didn't do well on my tests and there was no coming back from that."
Remunerative employment d850		
Nonremunerative employment d855		

ICF Component	ICF Definition and Inclusions	Participant Quote
Community, social, and civic life (d9)	Actions and tasks required to engage in organized social life outside the family, in community, social and civic areas of life.	
Community life (d910) Recreation and leisure (d920)	Engaging in any form of play, recreational or leisure activity, such as informal or organized play and sports , programs of physical fitness, relaxation, amusement or diversion, going to art galleries, museums, cinemas or theatres; engaging in crafts or hobbies, reading for enjoyment, playing musical instruments; sightseeing, tourism, and traveling for pleasure. Inclusions: play, sports, arts and culture, crafts, hobbies, and socializing	"I couldn't shoot hoops with my brother."
Environmental factors (e)	Make up the physical, social, and attitudinal environment in which people live and conduct their lives.	
Products and technology (e1)	The natural or human-made products or systems of products, equipment, and technology in an individual's immediate environment that are gathered, created, produced, or manufactured.	
Products and technology for personal indoor and outdoor mobility and transportation (e120)	p	
Design, construction and building products and technology of buildings for public use (e150)	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed, and constructed for public use, including those adapted or specially designed. Inclusions: design, construction and building products and technology of entrances and exits, facilities, and reuting.	"I had to go to buildings that had an elevator. I had to make sure I went to floors where there were elevators and had to figure out the best route to get there on time. I couldn't do stairs."
Natural environment and human-made changes to environment (e2)	Animate and inanimate elements of the natural or physical environment, and components of that environment that have been modified by people, as well as characteristics of human populations within that environment	
Physical geography (e210)	Features of landforms and bodies of water. Inclusions: features of geography included within orography (relief, quality and expanse of land and landforms including altitude) and hydrography (bodies of water such as lakes, rivers, sea)	"My yard, which is a little uneven and bumpy."
Support and relationships (e3)	People or animals that provide practical physical or emotional support, nurturing, protection, assistance, and relationships to other persons, in their home, place of work, or school, or at play or in other aspects of their daily activities.	
Immediate family (e310)	Individuals related by birth, marriage or other relationship recognized by the culture as immediate family, such as spouses, partners, parents , siblings, children, foster parents, adoptive parents, and grandparents.	"My parents babied me. They were like, lunch is in the fridge. They made be breakfast before they went to work. And then we had dinner when they got home. I went back to very infantile phase."
Friends (e320) Acquaintances, peers, colleagues, neighbors, and community members (e325) People in positions of authority (e330) Domesticated animals (e350) Health professionals (e355)		

ICF Component	ICF Definition and Inclusions	Participant Quote
Attitudes (e4)	The attitudes that are the observable consequences of customs, practices, ideologies, values, norms, factual beliefs, and religious beliefs.	
in positions of authority (e430)	other matters, (eg, social, political, and conomic issues), that influence individual behavior and actions.	was scary. Especially because I being recruited at that time. I remember I had to email the coaches and that was one of the hardest things. I couldn't do it. I had to have my dad do it."
Individual attitudes of health professionals (e450)		
Services, systems, and policies (e5)	This chapter is about: 1. Services that provide benefits, structured programs and operations, in various sectors of society, designed to meet the needs of individuals. 2. Systems that are administrative control and organizational mechanisms, and are established by governments at the local, regional, national, and international levels, or by other recognized authorities. 3. Policies constituted by rules, regulations, conventions, and standards established by governments at the local, regional, national, and international levels, or by other recognized authorities.	
Health services, systems, and policies (e580)	Services , systems, and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle.	"I was really excited when I found out that I could come work with the AT . It was awesome, because I was going to be with someone that knows what she's doing."
Body structures (s)	Anatomical parts of the body such as organs, limbs, and their components.	Ŭ
Structures related to movement (s7)		
Structures of the pelvic region (s740) Structures of lower extremity (s750)		
Skin and related structures (s8) Structures of areas of skin (s810)		

^a This table presents the 20 ICF first-level domains (denoted by a 1-digit numeric code) and 63 ICF second-level domains (denoted by a 3digit numeric code) that were linked to participant responses across all 4 ICF categories. A participant quote linked to the most specific second-level domain according to the ICF definition and inclusions is included for each of the 20 first-level domains. The linked terms are

bolded within the participant's quote and second-level domain definitions and inclusions. International Classification of Functioning, Disability and Health definitions and inclusions are also presented for all categories and first-level domains. For a complete listing of ICF definitions and categories, please see the ICF online browser (http://apps.who.int/classifications/icfbrowser/).