## Title

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# Qualitative analysis of resilience characteristics of people with unilateral transtibial amputation

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## Abstract

**Background—**Resilience characteristics are a significant factor in the highly variable rehabilitation outcomes for people in middle age or later with transtibial amputation.

**Objective—**The purpose of this study was to describe resilience characteristics meaningful to people with transtibial amputation in middle age or later, who use a prosthesis.

**Methods—**Semi-structured interviews were conducted, audio recorded, and transcribed with eighteen participants. Interview transcripts were coded and analyzed using a directed content analysis approach, guided by Charney's theory of resilience and Connor-Davidson Resilience Scale scores.

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**Results—**Five main resilience characteristics (themes) were identified: coping skills, cognitive flexibility, optimism, skill for facing fear, and social support. Participants with higher resilience scores generally described effective use of coping skills, cognitive flexibility, optimism, skills in facing fears, and social support to attain meaningful goals. In contrast, participants with lower resilience scores discussed passive coping strategies, cognitive rigidity, general pessimism, avoidance of activities due to fear, or social support limitations.

**Conclusion—**Coping skills, cognitive flexibility, optimism, skills for facing fear, and social support were identified as meaningful resilience characteristics for people with transtibial amputation in middle age or later. These characteristics can be targeted and enhanced using resilience interventions. Future research should consider these characteristics when designing and testing rehabilitation focused resilience interventions for people with TTA.

### Keywords

Resilience; Lower Extremity Amputation; Psychosocial; Qualitative; Coping

## Introduction

Resilience is a significant factor in rehabilitation outcomes for people with transtibial amputation (TTA) and other chronic physical disabilities.[1,2] Psychological resilience processes (e.g., cognition, coping) interact with biological systems to facilitate adaptation to stressful and traumatic life events.[3,4] Evidence suggests that people with chronic physical disability who have higher levels of resilience have greater life role satisfaction and quality of life.[1,2] Additionally, greater resilience at time of injury may be protective against future depression and predict greater social functioning.[1,2]

Resilience, theorized by Charney, is a collection of personal characteristics that facilitate how individuals adapt to adverse life events (Table 1).[3,4] Characteristics commonly linked with resilience include optimism, humor, cognitive flexibility, coping skills, skill at facing fears, moral compass, altruism, role model, social support, and physical exercise (Table 1).[3,4] For example, coping skills and cognitive flexibility induce acceptance of adversity and active problem solving to manage stress.[3,5,6] Additionally, role models and social support can provide examples of how to be resilient and successfully face fear while being a part of a support network.[3,4] Finally, physical exercise has known psychological and physiological benefits that enhance positive mood, self-efficacy, and physical hardiness.[3] Knowledge of resilience characteristics is the foundation for developing and testing resilience interventions that teach adaptation skills for stressful life events.[3,7,8]

One adverse life event where resilience is of particular importance is TTA. Traumatic and dysvascular etiologies of TTA comprise the largest proportion of people with lower-limb amputation, resulting in chronic physical disability.[9–11] For the majority of people with TTA, conventional rehabilitation largely focuses on improving physical function and gait using a prosthesis for mobility.[11–13] Despite physical function improvements with rehabilitation, physical activity (e.g., daily step count) and disability outcomes following TTA in middle age or older are poor and variable.[14–16] There is evidence to suggest that the physical activity and disability outcomes are partially attributed to resilience.[1,2,13]

Prior resilience research has not focused on people in middle age with traumatic and dysvascular etiologies of TTA. Therefore, it is unknown which resilience characteristic are relevant to this specific group. Furthermore, there has been a longstanding focus on rehabilitation research for young, healthy people with traumatic amputation, limiting generalizability of findings to older adults who have a higher incidence of comorbid conditions and other complicating factors.[17] Qualitative methods, using inductive and deductive approaches, are ideally suited to understanding specific resilience characteristics that should be targeted to improve disability outcomes.[8] The purpose of this study was to describe resilience characteristics meaningful to people with TTA in middle age or later, who use a prosthesis.

## Methods

### Sample recruitment and enrollment

Participants were recruited from regional hospitals, clinics, and amputation support groups. Additionally, letters describing the study were sent to potential participants based on query from electronic health records. Potential participants provided consent to contact or directly contacted the research team. A research team member then conducted a standardized phone screen to determine eligibility for enrollment. Participants were enrolled if they met the inclusion criteria of: 1) unilateral TTA of traumatic or dysvascular etiology; 2) at least one year since TTA; 3) walking independently with a prosthesis; 4) at least 45 years old; and 5) within driving distance of the Denver metro area. Potential participants were excluded if: 1) amputation was proximal or distal to the tibia; 2) cancer etiology; 3) history of stroke within the past two years; 4) were not walking using a prosthesis.

This qualitative study was part of a larger mixed-methods study with an interdisciplinary research team. The interdisciplinary research team, comprised of physical therapists, a psychologist, nurse, physiatrist, and PhD-trained qualitative methodologist, aimed to understand physical and psychosocial mechanisms of disability that can be targeted with novel interventions to improve rehabilitation outcomes after lower-limb amputation. Purposive sampling was used to gather a range of perceptions from people with TTA and guide qualitative data collection on the criteria of amputation etiology, United States military Veteran status, self-reported resilience, physical function, and disability.[18,19] This study sample was limited to unilateral TTA due to potentially unique experiences of people with greater severity of amputation.

### Data Collection

Participants were informed of the research team's interest in identifying physical and non-physical targets of rehabilitation for people with amputation. After obtaining informed consent, participants completed the Connor-Davidson Resilience Scale (CD-RISC), Functional Comorbidity Index (FCI), and World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) over the phone. The CD-RISC is a 25-item questionnaire used to quantify resilience, where higher scores indicate higher levels of resilience (max score = 100).[20] The FCI is a questionnaire to determine the number chronic conditions that are known to influence rehabilitation outcomes.[21] The WHODAS 2.0 is a 12-item questionnaire

used to assess the severity of disability due to any health condition, where higher scores indicate greater severity of disability.[22]

A physical therapist trained in qualitative methods (MJM) conducted all interviews following quantitative data collection, and had a prior research relationship with 33% of participants. The physical therapist did not have a therapeutic relationship with any of the participants but was acquainted with them through research activities that ranged from conducting blinded data collection to delivering up to 12 behavior-change intervention sessions (~30 minutes each). One-on-one interviews were conducted in participants' homes, or locations of their choosing. The interview guide (Table 2) was developed using an iterative, team-based approach and founded on expertise and prior research. To minimize risk of socially desirable responses with specific resilience focused questions, the interview guide was used to elicit participants' detailed narratives about life experiences. The narratives were then used to interpret which resilience characteristics were relevant to participants' mobility-related experience after TTA. Debriefing meetings with the interviewer and research team members occurred every one to two interviews to describe emergent constructs and identify areas that would benefit from probing in subsequent interviews. Furthermore, debriefing meetings were used by team members to take a naïve stance on the data, ensure emergent constructs were present within the data, and discuss thematic saturation progress.[23] Recruitment continued until there was consensus that thematic saturation, the point where no additional data collection would add to the analysis, was attained.[24] All interviews were audio recorded and transcribed verbatim. The study protocol was approved by the Colorado Multiple Institutional Review Board and Veterans Affairs Office of Research and Development.

## Analysis

Following semi-structured interview, participants were identified as resilient or low-resilient using CD-RISC scores. The general population cut point score (<82 points) was used to identify participants as low resilient because there is no consensus for CD-RISC cut points for people with TTA.[20] Identifying resilient and low-resilient groups was used to guide the qualitative interpretation of resilience characteristics meaningful to the study sample.

A directed content analysis approach was used to analyze the qualitative data. Directed content analysis uses inductive and deductive approaches to extend understanding of existing theory (e.g., Charney's theory of resilience).[25] The process of analysis began with the research team defining template codes (Table 1). After developing the template of codes, two members of the research team (MJM and MLM) read and re-read the semi-structured interview transcripts, applied relevant codes to transcripts, and inductively developed additional codes that were not in the original template codes. Transcripts were manually coded and analyzed for themes related to Charney's theory by considering predetermined resilience characteristics (deductive) and characteristics that are not specifically related to resilience (inductive). Themes related to Charney's theory of resilience were reviewed, specific definitions for people with TTA in middle age or later using a prosthesis were developed, refined, and consensus achieved, using an iterative process amongst the

interdisciplinary research team. The final step of the analysis was to develop a formal report of the findings.

## Results

One person refused to take part in the interview due to emotional difficulties after amputation. Semi-structured interviews (mean ± SD: 53 ± 10 min) were conducted with 18 participants (15 men, 3 women) to reach thematic saturation (Table 3). Five main themes of resilience were consistently described among resilient and low-resilient participants: coping skills, cognitive flexibility, optimism, skills for facing fear, and social support. Despite consistent emergence of these characteristics across resilient and low-resilient groups, participants reporting characteristics of resiliency generally described effective use of coping skills, cognitive flexibility, optimism, skills in facing fears, and social support to attain meaningful goals. In contrast, participants with characteristics of low-resilience discussed passive coping strategies, cognitive rigidity, general pessimism, avoidance of activities due to fear, or social support limitations. Humor, role model, moral compass, altruism, and physical exercise did not consistently emerge from participant narratives.

### Coping Skills

Participant coping skills included acceptance and use of action-oriented approaches to achieve personally meaningful goals.

**Acceptance—**Acceptance was commonly discussed as an initial feature of effective coping. One participant stated, “I was like, ‘Oh my god, I just--I just lost my leg.’ So, that was hard, emotionally, and--but you know, then you know the next day then it was just like, ‘Alright, how do I get out of here?’.” This participant went on to state, “I’ve accepted, I’ve moved on,” (51 years old; 6 years post-TTA).

**Action-oriented approaches to achieve goals—**Participants described personally meaningful goals and implementation of strategies, both successful and unsuccessful, to minimize identified barriers, achieve goals, and reduce their disability. For example, to attain the goal of returning to hunting, one participant described his need to ascend hills. He described his engagement in problem-solving to obtain this skill: “Straight up. Or you might zig-zag, depending on the slope. How steep it is, except that that right ankle doesn’t bend. When you put on the toe, a ton of weight, it jams back into your shin somethin’ fierce. You can’t really go straight up a hill if it’s at any kind of slope. A gentle hill, yeah, but I mean if you’re talking something that’s 30 degrees, only way up is side step,” (69 years old; 2.5 years post-TTA). Furthermore, a few participants in the resilient group described coping with stress through physical exercise (e.g., walking, biking) or stress management techniques (e.g., reading, writing).

**Low resilience—**Participants with low resilience did not describe problem-solving strategies that required their active engagement to succeed in personally meaningful goals. One participant said, “I hiked, I biked, I played volleyball competitively, up until my 40s with my husband, and did everything, anything I wanted to. And then this [amputation] happened, and it sucked to see my friends go on to be able to do those things and I

couldn't," (66 years old; 3 years post-TTA). Additionally, low-resilience emerged as a resignation with lower levels of physical functioning, more severe disability, or difficulty describing goals for the future. Another participant reported, "I've wanted to go to a [baseball] game--to go in person. But I can imagine it'd be a pretty long walk by the time you find a place to park and get in to find a seat. That'd be a pretty long walk. So, I just haven't bothered. Watch 'em on television. You can see it better anyway, but you know there's just something about the--going to a stadium," (73 years old, 6 years post-TTA).

### Cognitive Flexibility

Flexibility in thinking emerged as a resilience characteristic through participants' reflections of multiple avenues to achieve their goals and identification of modifiable and non-modifiable situational factors.

**Multiple avenues to achieve goals—**Cognitive flexibility was demonstrated by resilient participants through reflection about multiple modes of locomotion (e.g., walking mechanics, assistive devices), employment, or hobbies. One participant reported, "I've learned to kind of adapt my walking style," depending on the different shoe heel heights relative to prosthetic foot alignment (51 years old; 6 years post-TTA). Another participant stated, "Oh, I'm disabled. But again, you find a way to do what you want to do. If it's that important, you will find a way. It may take a long time, it may take other help, whatever you gotta do, but you'll find a way," (61 years old; 2.5 years post-TTA).

**Modifiable and non-modifiable factors—**Participants described that identification of modifiable factors (e.g., prosthesis fit, task process, physical function) and non-modifiable factors (e.g., loss of limb) prioritized their problem solving towards situational factors they could control. For example, a participant stated he could not squat or be down on one knee to change a car tire and, "That's a limitation that I've adapted to. So, I just put a stool down and then sit on the stool, and then do what I gotta do. So, you just have to take the limitations, and then adapt to do things that way," (69 years old; 2.5 years post-TTA).

**Low resilience—**Participants with low resilience attributed nonparticipation or task failure to factors they perceived as non-modifiable (e.g., pain, physical function) or discussed frustration with attempts to do tasks with strategies that were previously successful. When considering returning to a hobby one participant found enjoyable, their response was, "That's like frustration having a date with stubbornness. I'm too stubborn to let it go, and [it] angers me in a way that something that was once mine has been--you know--taken away," (65 years old; 10 years post-TTA). Furthermore, low-resilient participants would identify one solution to attain one goal, without describing an alternative solution or goal with a similar desired outcome. For example, "So, [the amputation has] affected all my life, and it takes a lot more effort to do anything. So, in terms of even your ADLs or getting dressed, I have to do things a very specific way," (66 years old; 3 years post-TTA).

### Optimism

Participants with characteristics of optimism commonly described positive perspectives and pride in overcoming challenging situations following TTA.

**Positive perspectives—**Participants consistently stated the importance of maintaining a positive perspective after amputation. For example, one participant stated, “Keep a good outlook. Don’t get depressed. [That’s the] number one rule. That is 90% of the battle. If you can keep a good outlook, you’ll get through it and you’ll get on with life,” (54 years old; 2.5 years post-TTA). Participants also used positive perspectives to describe their hopes for the future. Occasionally, participants with resilient or low-resilient scores discussed use of humor in stressful social situations or used humor during the interview.

**Pride—**Participants described pride in success, building their confidence in pursuit of challenging goals. Another participant stated, “[Being active] is incredibly gratifying. I mean, in this circumstance in particular, maybe because it’s like I’ve been recovering something. That feeling like, yea. I mean, it makes me really proud,” (54 years old; 1 years post-TTA).

**Low resilience—**Participants with low resilience had difficulty identifying positive aspects of their situation and commonly described negative features of their care and lives. One participant reported that outpatient physical therapy was “a waste of time,” (73 years old, 6 years post-TTA). Another participant reported, “You’re different, you know, and you’re not part of the group. You know, you can’t play sports. You can’t dance. I can get around. I can go to a restaurant. I can drive a car, but I can’t do anything physical,” (62 years old; 7 years post-TTA).

### Skill for Facing Fear

Fear of negative consequences (e.g., falling, failure) when performing everyday tasks were common among all participants. Skill for facing fear, especially working through fear, was a defining characteristic that separated those with higher resilience scores from those with lower resilience scores.

**Working through fear—**Participants’ descriptions of working through fear and challenge included thoughtful appraisal of potential failure, benefits, and risks associated with selected activity adaptations. For example, one participant reflecting on safety related to risk for falls stated, “I am very cautious of [falls]. I’m aware of my situation, where I’m at. I take great care in watching the terrain when I’m moving around. You know it’s just something that I watch very closely. I mean, I’ve had people fall in my yard with two good legs. So, it’s something that I watch all the time. I’m constantly vigilant about that,” (69 years old; 2.5 years post-TTA).

**Low resilience—**Participants with lower resilience did not discuss consideration of potential risks in light of current functional level, prosthesis function, or potential benefits of facing feared or challenging activities. The absence of risk appraisal commonly resulted in failures that were detrimental to future activities. Participants described avoidance of activities due to fear of potential risks or previously experienced failures. For example, one participant did not consider his poor activity tolerance when attempting to walk his dog after dysvascular TTA: “I made it about a block and a half and said, ‘Yeah, this isn’t going to work.’ Turned around, went back. In fact, that’s one of the times I fell.” The participant went

on to say, “[I] don’t go bowling. [I] don’t go--don’t walk my dogs. [I] don’t go for long walks with my wife. We used to occasionally. I don’t do much of anything around the house anymore,” (73 years old, 6 years post-TTA). Furthermore, fear of social perceptions led one participant to avoid activities that he felt made his TTA conspicuous, “You’re seen differently. You can’t do some of the things other people can. Like, I can’t hot tub. I can’t swim--you know I don’t want to swim because, you know, you get looked at funny because you got no leg, so, you are limited to things you can do socially, limited to things you can do physically and that hones at you psychologically, because you’re handicapped,” (62 years old; 7 years post-TTA).

## Social Support

Participants discussed how their social network supported them through difficult situations and enhanced optimism.

**Support through difficult situations—**Social support networks, variably comprised of family, friends, and healthcare providers, assisted participants in returning to prior activities or engage in new activities. A participant said, “My then partner, now spouse, was around for the surgeries and really helpful. Family’s always been great, and I had work environments that were pretty accommodating with me. You know, taking time off to have surgery or whatever. So, I was not isolated. I was not dealing with it in a vacuum,” (54 years old; 1 year post-TTA). This was especially true when seeking guidance from healthcare providers.

**Enhanced optimism—**Participants with higher levels of resilience commonly discussed increased confidence and positive reinforcement with comments about progress towards expected benchmarks and in situations where progress was better than anticipated. For example, one participant reflecting on running a few steps for the first time with a prosthesis stated, “[The prosthetist] put me through my paces, the first day I put the running leg on, he literally told me, ‘I’ve never seen anybody do what you just did’,” (54 years old; 4.5 years post-TTA).

**Low resilience—**Lower resilience emerged through frequent discussion of avoiding or a paucity of support from social networks. Additionally, some participants reported difficulty identifying people to provide support when needed. When social networks were present, some participants with lower resilience scores avoided them because they were seen as a source of frustration in their situation. For example, “I was happy that they were there, but I was frustrated probably that I couldn’t do it for myself or that they wouldn’t let me do it for myself. If I would start to do something, then they would jump and start doing it, and that drove me crazy,” (56 years old; 6 years post-TTA). Another participant with low resilience reported that he, “Argued--Over what I was gonna do, and what they felt was gonna work, and what I felt was not gonna work, which is what they thought would work,” (64 years old; 3 years post-TTA).

## Discussion

The purpose of this study was to describe resilience characteristics meaningful to people with TTA in middle age or later who use a prosthesis for mobility. Using a directed content analysis of semi-structured interview transcripts, five resilience characteristics were identified: coping skills, cognitive flexibility, optimism, skills for facing fear, and social support.

Prior qualitative and quantitative research has identified similar resilience factors that influence disability and health outcomes following amputation.[6,26–29] A variety of coping strategies are adopted and selected strategies change over time after amputation.[26,29,30] For example, coping may be achieved through support seeking, avoidance, problem solving, or psychological escape, where longstanding avoidance is commonly thought to be maladaptive.[26,29,31,32] Findings from the present study suggest that coping skills, in combination with other identified resilience characteristics (e.g., cognitive flexibility, optimism), are likely to influence rehabilitation outcomes in people with transtibial amputation. Cognitive flexibility, as in flexible goal setting and pursuit, is associated with less severe disability.[6,28,33] Additionally, optimism (e.g., hope, positive mood) facilitates acceptance of limb-loss through finding meaning in life challenges.[26,34,35] Finally, social support and support groups have been long implicated in improving rehabilitation outcomes following limb-loss by providing emotional support and gaining perspectives from others in similar situations.[30,35–38]

The findings of this study contribute to a growing body of work that is addressing the historical rehabilitation research focus on younger people with traumatic amputation, which has limited generalizability of research to older populations with amputation.[17] Using a directed content analysis provided an opportunity to extend Charney's theory of resilience beyond previously studied populations to people with the specific health condition of TTA in middle age or later. Furthermore, use of Charney's theory of resilience provided a framework for the conceptualization of how previously identified characteristics may have reciprocal relationships that facilitate or inhibit adaptation after lower-limb amputation. For example, participants' descriptions of social support in optimistic terms may lead to flexible coping and less avoidant strategies. Alternatively, negative perceptions may lead to avoidance of social support, rigid thinking, goal setting, and passive adaptation strategies.

Characteristics that did not emerge in this study, including humor, moral compass, altruism, role model, and physical exercise, may have implications for intervention design for people with TTA. Although these characteristics are targets of interventions and contribute to resilience in previously studied populations, the narratives from our sample of people with TTA suggest they may not be the most meaningful to their mobility-related experiences or they may be embedded within other characteristics. For example, resilient and low-resilient participants inconsistently used humor in the broader context of optimism or described role models within larger social support networks. The embedded nature of these characteristics suggests further research is needed to better understand the structure of resilience after amputation. Finally, people with TTA are known to be largely sedentary, therefore the absence of physical exercise from emergent characteristics is an expected finding.[15,39] The

absence of these characteristics may suggest that they may not be meaningful targets of resilience-based rehabilitation interventions with people with TTA.

Importantly, Charney's theory of resilience suggests that the characteristics identified within this study can be enhanced and learned through experience and intervention. Resilience interventions based in cognitive behavioral therapy can effectively improve coping skills, cognitive flexibility, optimism, skills at facing fears, and social support for people who have experienced trauma or chronic stress.[4] Resilience interventions provide individualized opportunities over time to practice and develop resilience characteristics.[4,7] Coping skills and cognitive flexibility are developed using self-monitoring and reframing techniques, and risk appraisal is used to enhance skills in facing fears while minimizing avoidance behaviors.[4,7] Furthermore, effective use of social support, developing optimism, and positive expectations for the future can be encouraged and facilitated.[4] Future resilience interventions with a rehabilitation focus for people with TTA can use previously developed approaches to improve the five specific characteristics identified in this study. For example, a resilience intervention tailored to personal needs after TTA may include facilitation of social support seeking, fall risk appraisal, and reframing of negative experiences to develop positive future expectations, that are flexible, while safely facing fears.

There are study limitations that should be acknowledged. Although these qualitative findings can guide the development of rehabilitation focused resilience intervention, further research is required to understand the mechanisms of resilience for people with TTA.[40] The study sample was predominantly male due to enrollment of Veterans, where women represent a small proportion of the total Veteran population. Further, this study included only people with unilateral TTA. There are differences in rehabilitation outcomes for women, bilateral, or higher-level (i.e., above knee) amputations, potentially limiting transferability of findings from this study. Furthermore, relationships among resilience, time since amputation, physical function are largely unknown and the CD-RISC has not specifically been evaluated for people with TTA. Future quantitative and qualitative research should be conducted to investigate the performance of the CD-RISC following amputation, the relationship of resilience and physical function, and determine if findings are consistent with larger samples that have a greater proportion of females or greater severity of amputation (e.g., bilateral, transfemoral, disarticulation).

## Conclusions

Resilience characteristics have the potential to influence rehabilitation outcomes following TTA in middle age or older. People with TTA who had higher resilience scores described use of coping skills, cognitive flexibility, optimism, skills for facing fear, and social support to adapt to life. These characteristics can be targeted and enhanced using resilience interventions. Future research should consider these characteristics when designing and testing rehabilitation focused resilience interventions for people with TTA.

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**Table 1.**

Resilience characteristics that can be learned

| Characteristic | Definition |
|---|---|
| Optimism | Positive affect: expectation of a good outcome |
| Humor | Adaptive and protective mechanism used to minimize threat |
| Cognitive Flexibility | Ability to produce alternative outcomes, solutions, goals, reframe challenging situations, accept uncontrollable situational features |
| Coping Skills | Active use of productive str ategies for solving problems, managing stress, and regulating emotions during stressful events |
| Skill at Facing Fears | Critical appraisal of threats; selecting appropriate actions to move through fear |
| Moral Compass | Spiritual or religious beliefs that guide coping |
| Altruism | Moral compass in action: assisting and caring for others |
| Role Model | Learning through observation of a resilient person |
| Social Support | Network of people that buffer against stress: protects personal well-being. |
| Physical Exercise | Active form of stress management that increases physiologic and psychologic resilience. |

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**Table 2.**

Semi-structured interview guide

| **Primary Questions:** | **Example Probe:** |
|---|---|
| Describe how your health, including your amputation, affect your day-to-day life. | What is different in your life after the amputation? |
| Describe your rehabilitation after the amputation? | What helped you the most? |
| How would you describe your physical exercise? | What do you do for exercise? |
| Tell me about your prosthesis. | How do you use your prosthesis? |
| Can you describe how your amputation came about? | What was your recovery process like? |

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**Table 3:**

Participant characteristics

| | Overall sample (N=18) | Resilient * (N=9) | Low-Resilient (N=9) |
|---|---|---|---|
| | | N (%) | |
| Male/Female | 15 (83%)/3 (17%) | 7 (78%)/2 (22%) | 8 (89%)/1 (11%) |
| Non-Hispanic White | 15 (83%) | 7 (78%) | 8 (89%) |
| U.S. military Veteran | 12 (67%) | 5 (56%) | 7 (78%) |
| Dysvascular TTA | 13 (72%) | 5 (56%) | 8 (89%) |
| | | Mean ± SD | |
| Age (years) | 60 ±7 | 59 ±9 | 61 ±6 |
| Time since TTA (months) | 60 ± 38 | 57 ±46 | 62 ± 32 |
| CD-RISC score | 79 ± 14 | 89 ±4 | 69 ± 13 |
| FCI score | 5 ± 3 | 5 ± 2 | 6 ± 3 |
| WHODAS 2.0 score | 21 ± 8 | 18 ± 7 | 23 ±9 |

* CD-RISC score ≥ 82 points

TTA: Transtibial Amputation

CD-RISC: Connor-Davidson Resilience Scale

FCI: Functional Comorbidity Index

WHODAS 2.0: World Health Organization Disability Assessment Schedule 2.0