



## Original Article

## Pain Support for Adults with a Diabetes-Related Lower Limb Amputation: an Empirical Phenomenology Study

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## ABSTRACT

**Background:** Chronic pain after lower extremity amputation surgery has been reported in up to 80% of patients. Amputations are among the most debilitating chronic complication of diabetes with a variety of consequences including depression, inability to perform daily activities, and change in quality of life. **Aims:** This study sought to understand the lived experience of chronic pain support among those who have undergone a diabetes-related lower limb amputation.

**Method:** Researchers used a qualitative empirical phenomenology design. Private, semistructured interviews were conducted on a purposive sample ( $N = 11$ ). Codes were identified for each participant separately and then across participants for common themes.

**Results:** Three major themes emerged from the research: (1) Phantom pain is nontreatable pain; (2) support systems were nonempathetic; and (3) participants experienced identification of a new normal. Participants did not understand that neuropathic (phantom) pain was part of the total pain experience. Further, they felt that there was no help from family or providers for alleviation of this pain.

**Conclusions:** Phantom pain was identified as something the participants had to tolerate when it occurred. They did not feel that family or providers understood their pain. Further, they wanted a means of controlling their pain using nonpharmacologic therapies.

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Diabetes is a disease that has ravaged much of the US population. It has been extremely prevalent in the southeast (American Diabetes Association [ADA], 2016). Additionally, diabetes was the seventh leading cause of death in the United States in 2010 (ADA, 2016). The ADA (2016) reports that 9.3% of the total US population has been diagnosed with diabetes. In some states, diabetes rates are worse than the national average, with some as high as 13.1% of the population with an estimated 247,000 undiagnosed (ADA, 2014). Unlike an acute disease that is usually confined to one body system, diabetes is chronic and systemic, affecting many systems and often leading to debilitation (Diabetes North Carolina, n.d.). Complications from diabetes include chronic kidney problems, sleep apnea, stroke, cardiovascular events, and limb amputations (Diabetes North Carolina, n.d.).

Among the most debilitating chronic complication of diabetes is limb amputation. In 2010 alone, 73,000 nontraumatic lower-limb amputations were performed on adults older than 20 years as a result of diabetes (ADA, 2016). Approximately 54% of all amputations performed each year are due to a dysvascular cause, with diabetes being the primary reason (Amputee Coalition, 2017). Amputations are among the most devastating complications of diabetes, with an increased likelihood of depression, inability to perform activities of daily living, differential treatment associated with chronic pain, and perceived inability to reintegrate into society (Anderson et al., 2017; de Godoy, Braile, Buzatto, Longo, & Fontes, 2002). Although prosthetics are becoming more effective at minimizing these complications, they are still difficult to use, difficult to acquire, and often do not solve underlying psychological and pain problems (Hoffman, 2013). Thus continued complications lead to a lifelong struggle to maintain autonomy and function.

Individuals with an amputation often have daily chronic pain. It is estimated that approximately 80% of these individuals end up with chronic pain (Hsu & Cohen, 2013). The pain is multidimensional and difficult to control. Neuropathic pain (phantom pain) can last a lifetime for individuals with a lower extremity amputation (Wooden, 2017). Unfortunately, control of neuropathic pain is

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unsatisfactory. Individuals with amputations have reported that their pain is not well controlled; thus they may stop seeking treatment because of its ineffectiveness (Kern, Busch, Muller, Kohl, & Birklein, 2012). In one study, 17 different pain management methods were mentioned by participants, and only 3 had greater than a 50% success rate (Kern, et al., 2012).

The purpose of this study was to understand the lived experience of pain among those who have undergone a diabetes-related lower limb amputation—more specifically, to understand the subjective experiences with chronic amputation pain and responses from family members, friends, and health care providers using a phenomenologic approach.

## Methodology

A qualitative empirical phenomenology design was used with semistructured questions. Empirical phenomenology is characterized by its emphasis on structure and the commonality of experiences between multiple participants (Hein & Austin, 2001). Unlike hermeneutic phenomenology, which focuses on creating rich descriptions by inferring and uncovering information, the empirical method focuses on the exact words of participants and depends on the realistic data provided (Hein & Austin, 2001). The structural nature of empirical phenomenology necessitates a stepwise approach in which the researcher is first immersed in the data and then assigns codes to the participant's words so that they can be combined into common themes (Hein & Austin, 2001).

### Participants and Setting

This study was approved by the university's medical institutional review board. After approval, a purposive sample (typical case) was recruited at a local orthotics and prosthetics office in the southeastern United States. Typical case sampling was used because of the normality in amputation cases being caused primarily by complications of diabetes (Amputation Coalition, 2017). The office is a busy independent practice providing orthotic appliances and artificial limbs to individuals. The study took place from August 2017 to February 2018. Inclusion criteria for the study were (1) age 18 years or older, (2) having a diagnosis of diabetes, (3) had a lower extremity amputation because of complications from diabetes at least 6 months before the interview, and (4) English speaking. Office staff at the practice selected individuals who fit these criteria and approached them about participating in the study. Participants who agreed to participate then were met by a principal investigator who explained the study and obtained consent for participation. Recruitment and data were discontinued when saturation was identified.

Demographic characteristics were obtained before starting the interview and were self-reported by each participant. Semistructured interviews were conducted in a private room within the practice. Participants were asked one overarching question related to interaction with family and healthcare providers and their amputation pain. Probe and follow-up questions were asked as needed to clarify responses. Each interview lasted approximately 30–60 minutes and was audio recorded and transcribed. Field notes were recorded by the principal investigator after each interview.

### Data Analysis

Simultaneous data analysis was conducted during data collection. After each interview, the researcher would transcribe verbatim from the recorded interview. The transcripts were then checked with the recording and field notes for accuracy. The transcripts were reread several times for reflection on the data. After

rereading several times and cross-checking the recording with the transcribed document, statements were identified that were relevant to the phenomenon being studied. Themes were coded from the statements. The statements and themes provided an individual description of the participant's experience. Colaizzi (1978) referred to these as a situated structural description. After all transcripts were reviewed separately, they were compared for shared meaning and themes. Three researchers completed this process separately and then compared results to enhance the credibility of the analysis. NVivo 11.0 (QSR International Pty Ltd., London, UK) was also used to organize and validate coding of the data.

## Results

A total of 14 individuals were approached. Three refused to participate. The final sample ( $N = 11$ ) was 56% male with a mean age of 60.82 years (standard deviation =  $\pm 15.5$ ). Saturation was reached with the 11th interview, and recruitment ended. Participants were African American ( $n = 5$ , 49.5%), Caucasian ( $n = 5$ , 49.5%), and Native American ( $n = 1$ , 1%). All participants had undergone amputation more than 6 months before the interview.

Three themes emerged from the data: (1) Phantom pain is non-treatable pain; (2) support systems were non-empathetic; and (3) participants experienced identification of a new normal. Each of these themes had two subthemes. For the first theme, *phantom pain is non-treatable*, subthemes were as follows: (a) there was no association of phantom pain with the overall pain experience and (b) participants' believed that phantom pain could not be helped. For the second theme, *non-empathetic support systems*, subthemes were as follows: (a) Lack of understanding from others and (b) analgesics were the only option to treat. For the third theme, *identification of a new normal*, subthemes were as follows: (a) amputation as a choice and (b) hope and spirituality.

### Phantom Pain is Non-treatable Pain

Two common reasons for not identifying phantom pain as part of the total pain experience (residual limb pain and phantom or neuropathic pain) emerged from the data. First, participants did not associate the phantom pain sensations with their overall pain experience. Second, participants had a belief that their phantom pain could not be helped.

### Pain Non-existent

When asked about interactions with family members related to their amputation pain, participants responded that they do not have pain. However, when probed about phantom pain they described the pain in detail and discussed the significant impact on their daily lives. One participant stated that the pain is "nonexistent except phantom pain." Another stated, "Really, I didn't have that much pain with the amputation" and later stated that "[phantom pain is] not something you can associate with something really bothering you." The participants in this study associated overall pain with surgical pain and disassociated phantom pain from the holistic pain experience after lower limb removal.

A common response among the participants was to make the pain seem less important or to deemphasize the pain. One participant excused the pain by stating she had a high pain tolerance. Another participant stated that she did not have real pain but had an infection that was causing her pain. Denial of pain was reported by one person, yet the person described pain associated with phantom pain, using phrases such as "sharp pain in the toes."

### Helplessness

A second subtheme centered on the feeling of helplessness in resolving or improving phantom pain. This feeling resulted in the participants not discussing the pain experience with others. When asked about talking to his health care provider about phantom pain, one participant said he does not mention it because “nothing they can do about it...all amputees experience it.” Another participant said, “Nothing you can do...like hitting yourself in the elbow in the funny bone with a hammer...just has to work itself out.” A common reaction when the individuals would first experience the pain was just to tolerate it until it ended. One participant described it as just “ride it out,” whereas another stated, “Take something and keep going.” Overall, participants believed that phantom pain was something they needed to endure and not discuss because it was inevitable. See [Table 1](#) for further support of theme and subthemes.

### Non-empathetic Support Systems

Participants discussed feeling supported by friends, family members, and health care providers but did not feel that their pain

experience was understood. Because of this gap in understanding, participants were unable to fully share their experience or receive full support. Although health care providers were quick to prescribe medications, participants gravitated toward nonpharmacologic treatments and discussed the need for additional alternatives.

### Lack of Understanding

Participants expressed that friends and family were very supportive. At the same time, they expressed that friends and family either did not know how to help or got tired of hearing them discuss their pain. One participant explained she had a great amount of support through surgery and recovery, although she later stated that after returning home, family would not let her have a “pity party.” A male participant stated that his significant other is a “tremendous help, don’t know where I’d be if it wasn’t for her,” followed by stating that he will not “sit there and go into a discussion about it [phantom pain]” because “people don’t want to hear what is going on with you.” Others stated that their family members simply did not understand why they were in pain or what it felt like. As one participant explained, “They can’t say anything or

**Table 1**  
Themes and Subthemes

Theme	Subtheme	Supporting Quotes
Phantom pain is nontreatable pain	Pain nonexistent	<p>“When they cut it off they cut the pain off too.”</p> <p>“Really, didn’t hurt except the phantom pain.”</p> <p>“I have a high pain tolerance.”</p> <p>“I didn’t have real pain, I had infection all the time.”</p> <p>“Not something [phantom pain] you can associate with something really bothering you.”</p> <p>“I didn’t have no pain... [phantom pain] feels sharp, like some pinching; especially in the toes.”</p> <p>“Pain nonexistent except phantom pain.”</p>
	Helplessness	<p>“I take something and keep going.” [I have] “high pain tolerance.”</p> <p>“We will endure a lot...have to keep faith.... [I] still have feeling.... [I’m] still a man...still rely on my strength.”</p> <p>“Nothing you can do” [about phantom pain].</p> <p>“Like hitting yourself in elbow in funny bone with hammer; just has to work itself out.”</p> <p>“Don’t do nothing, just ride it out.”</p>
Nonempathetic support systems	Lack of understanding	<p>[Husband] “very supportive...I keep pretty much to myself.”</p> <p>[Wife tells me] “bear with it.”</p> <p>[Others tell me] “sorry buddy, can’t do nothing about it.”</p> <p>“They don’t let me have a pity party.”</p> <p>“They’re trying to take care best they know how but I really don’t care.”</p> <p>“I keep to myself...why lay it on someone else when they can’t do nothing?”</p> <p>“I don’t sit there and go into a discussion about it; people don’t want to hear what’s going on with you.”</p> <p>“They understood; nothing they could do but they sympathized; they can’t say anything or help because they can’t wrap their heads around it; can’t tell how to correct if never been in the situation.”</p> <p>“Some thought I was putting on. I was grunting and flinching, they thought I was messing, but I won’t. They found out that’s the way it was...couldn’t tell me anything.”</p>
	Analgesics-only option	<p>“They prescribe something for me and I tell them right quick, I don’t want to take that.” [Health care provider believes] “I’m crazy because I don’t want to be on narcotics.”</p> <p>“Don’t really talk about pain” [with health care provider].</p> <p>“Doesn’t hurt that bad to take medicine.”</p> <p>“Don’t mention anything [about phantom pain to health care provider]...nothing they can do about it...all amputees experience it.”</p>
Identification of a new normal	Amputation as a choice	<p>“Kinda a hard decision...I hated it so bad but I told him to take it off.”</p> <p>“I said no more. Take it ...best thing I ever did.”</p> <p>“Trying to get to the point of doing what I did before...have to get over fear of doing new things.”</p> <p>“My decision to have amputation...could have saved my leg but would have had more problems.”</p> <p>“It was my choice...best choice.... I’m free to do what I want...get back to normal instead of letting others do stuff for me.”</p>
	Hope and spirituality	<p>“I’m thankful. I’m blessed, I’m alive.”</p> <p>“I thank God I’m still here.”</p> <p>“Don’t let it depress you.”</p> <p>“The almighty God, other than that I think I’d be down in the dumps.”</p> <p>“I can make jokes...fortunate to walk, some can’t.”</p> <p>“Keep going...there is always somebody worse off than you.”</p> <p>“I cry out to Jehovah so I’m good.”</p> <p>“Accept it, it’s happened...go on and live.”</p> <p>“Don’t let it worry you.”</p>

help because they can't wrap their heads around it." All participants shared this feeling of family being supportive but not understanding the pain; therefore they had reluctance in sharing.

#### *Analgesics-only Option*

Participants expressed frustration at the lack of treatment options for phantom pain. There was an overwhelming sense that nothing could be done for the phantom pain, and there were no alternatives to alleviate the pain. Health care providers understood standards of care for phantom pain but did not understand how to address phantom pain experienced while currently taking medications for pain. Some participants stated that they would pat or rub the residual limb, which would help during painful periods. Another participant shared not wanting to manage the phantom pain primarily through medicine. A male participant stated that he did not talk to his doctors about his phantom pain because "they prescribe something for me and I tell them right quick, I don't want to take that." Another acknowledged that her primary care provider continues to want her to take analgesics despite her insistence that she wants to manage her pain through alternative methods. She stated that her health care provider believes "I'm crazy because I don't want to be on narcotics." Many participants stated that the side effects of traditional pain medications were worse than the pain itself and thus did not want to continue to take pain medication (Table 1).

#### *Identification of a New Normal*

Making a choice to have the limb amputated was an important factor in giving participants a certain level of control, leading to finding a sense of normalcy after amputation. Many discussed how their religious beliefs or hopefulness helped them to cope with this significant life change.

#### *Amputation as a Choice*

Participants recognized that when they chose to have the amputation, as opposed to having an urgent amputation, it allowed a more positive recovery and return to a more normal state because they controlled the decision. Two participants shared that deciding to get their leg amputated was the best decision they ever made. One said that it has allowed her to "get back to normal instead of letting others do stuff for me." Another explained that she is constantly working on returning to a normal life. Still another explained that she feels her pain is less severe than a friend who had a traumatic amputation because she made the choice to get it amputated and therefore had more time to prepare. Overall, the ability to be independent both in the decision to have an amputation and the recovery process seems to be significant.

#### *Hope and Spirituality*

Participants expressed that their hopeful outlook on life and faith assisted them in coping and in dealing with the daily pain. Many expressed that they were "thankful" and "blessed." One participant shared that if it was not for "the almighty God" he would be "down in the dumps." Another participant stated that she keeps going because there is "always somebody worse off than you." The overall attitude of the participants was expressed by one female participant who shared that she tries not to get depressed by looking at the entire situation but only what the challenge was at the moment. She identified that as, "Do what you can at the moment to do things right." Yet another participant stated, "Don't let it depress you." See Table 1 for support of themes and subthemes.

## **Discussion**

The results of this study confirm previous research that identified phantom pain as one of the most significant consequences of a lower limb amputation and the significant effect that it has on daily life (Anderson et al., 2017; Coffey, Gallagher, Horgan, Desmond, & MacLachlan, 2009; de Godoy et al., 2002). This is important because the interference with daily living can alter a person's life, leaving the person unable to participate in social and functional activities, leading to depressive symptoms and a diminishing quality of life (Coffey et al., 2009; de Godoy et al., 2002).

Phantom pain has been well documented as a complication of lower limb amputation in many patients (Hsu & Cohen, 2013; Knezevic et al., 2015; Livingstone, Van De Mortel, & Taylor, 2011). However, in this study the participants did not see the connection between phantom pain and the overall pain experience after lower limb amputation. Previous descriptive studies have found there are two distinct types of pain after amputation, nociceptive (post-operative inflammatory) and neuropathic (phantom) pain (Ephraim, Wegener, MacKenzie, Dillingham, & Pezzin, 2005; Hsu & Cohen, 2013). Furthermore, the fact that 80% of individuals with lower limb amputation live with chronic pain is attributed to the neuropathic pain (Kuffler, 2018; Wooden, 2017). Chronic persistent postoperative pain as defined by Wooden (2017) is pain lasting longer than 2 months after surgery and that is not attributed to other sources, such as disease or inflammation. Studies have found that those who experience chronic pain have a sense of helplessness and inability to get out of a metaphorical pit (Beattie, Campbell, & Vedhara, 2014; de Oliveria & Boemer, 2007; Knezevic et al., 2015; Livingstone et al., 2011). These feelings may lead to a decreased sense of self-worth, which further adds to the pain experience (Kato et al., 2016; Monsivais, 2013; Wooden, 2017). In this study the participants had their amputation a minimum of 6 months before the interview, thus leading to a defined chronic pain state. This study suggests that those who have a lower limb amputation may view phantom pain as something that is inevitable and separate from the entire pain experience.

Further, the findings of this study suggest that individuals with a lower limb amputation may perceive phantom pain as untreatable and may not seek treatment. Most of the participants believed that they had to work through the pain and to continue their everyday tasks while experiencing pain. In a study designed to explore descriptors of pain, the author found the participants wanted to deal with the pain on their own terms. Many rubbed the missing limb for comfort. Further, the participants shared that they attempted "hitting" the residual limb, looking for a pressure point that could relieve their pain (Evans, 2013). Another study echoes this study, finding that most of the participants experienced phantom pain and tried to relieve it in their own way (Bosmans et al., 2007). In this study, most of the participants did not seek pain treatment from health care personnel.

Previous studies have focused on the importance of positive social support from family, friends, and the community for the individual with diabetes, chronic pain, and a lower limb amputation (Della, Ashlock, & Basta, 2016; Hoffman, 2013; Kato et al., 2016). Although social support was present and others desired to help, there was a lack of true support because of the absence of understanding what the person was experiencing. In response to this, individuals who have had an amputation may close off and stop discussing their pain with those closest to them. The inability of their social support system to provide meaningful help may lead them to feel burdensome to others and to believe that others do not want to hear about their experiences.

Current pain management methods for phantom pain are often insufficient for the individual who has had a lower limb amputation

(Hsu & Cohen, 2013; Kern et al., 2012; Wooden, 2017). Chronic pain is one of the primary factors that decreases quality of life in the individual with an amputation and should be treated by health care personnel (Knezevic et al., 2015; Livingstone et al., 2011). Although much research has been conducted on medication for amputation pain control, alternatives or complementary therapy have not received as much attention for treatment of neuropathic pain (Alvair, Hale, & Dungca, 2016; Knotkova, Cruciani, Tronnier, & Rasche, 2012). This study indicates that there is a need for alternatives to pain medication in the individual with lower limb amputation. In addition, this study also found there was a lack of offering any alternatives for pain management. Participants were unaware that they had the option of trying other approaches to control their pain. Furthermore, traditional pain medications have a variety of unpleasant side effects and many individuals refuse to take them for this reason.

Livingstone et al. (2011) found that endurance and adaptation were important factors in recovery for the individual with a diabetes-related lower limb amputation. This research confirms those themes and builds on them by identifying independence as a potential factor that differentiates diabetes-related amputations from traumatic amputations. The ability to choose an amputation over other treatment options leads to a significant positive psychological factor for participants in this study. Their choice to have the amputation allowed the participants to feel in control of the treatment. Most of the participants described having freedom to continue with their life. The feeling was almost as if the amputation had shed the diseased limb.

Anderson et al. (2017) identified lower limb amputation as a significant life event that can lead to depression and anxiety in those who are unable to find a new normal. This research confirms these findings and identifies ways some individuals may cope with the dramatic life change of a lower limb amputation. In nearly all cases, participants found hope despite very difficult circumstances and expressed that they felt they still had it better than others. Spirituality played a role in this transition, which has not been significantly studied previously in this population. For many participants, there appeared to be a better ability to cope with pain after an amputation because of this hopeful perspective on life and the situation.

This research contributes to the growing knowledge of the lived experience of individuals who have undergone a lower limb amputation related to diabetes. Following a similar methodology to Livingstone et al. (2011), it seeks to continue to understand the perspectives of these individuals. There is an increasing need for education about and treatment of phantom pain for patients, their social support system, and health care personnel. In addition, there is a need for alternative and complementary therapies for these individuals. Having a lower limb amputated is a significant and life-changing event. It requires great resiliency to return to a new state of normal life.

### Implications for Practice

This research highlights the need for improved information and support of individuals having a lower limb amputation about the entire pain experience. Although participants understood what phantom pain was, they seemed to have misconceptions about whether it was considered a real part of pain. Detailed description of pain should be provided before surgery, through recovery and rehabilitation. Health care personnel could improve on the explanation of pain after lower limb amputation. A comprehensive and individualized pain plan should be discussed between the health care provider and the individual regarding the best approach for pain relief. An empathic and trusting relationship should build

communication with the individual and his or her health care team through the recovery process and beyond.

Lastly, providing other means of pain relief is necessary for these individuals because of the chronic nature of the pain. There is a need for alternative methods of pain control, as expressed in this research. Thus a need for research focusing on self-management alternative pain methods for individuals with lower limb amputations is important. We recommend a better understanding of the multidimensional aspect of lower limb amputation pain and offering alternatives so patients can self-manage their neuropathic pain.

### Limitations

This study was done in one geographic location and cannot be generalized. More diverse findings could be identified in multiple sites. Other phenomenology studies using individuals who have an amputation as a result of other causes are needed for comparison of experience.

### Conclusions

As the number of people affected by diabetes and its comorbid sequelae, such as amputation, continue to rise, there will be a need for health care personnel to understand and effectively treat chronic neuropathic pain. Understanding the reactions and needs of individuals living with chronic neuropathic pain is integral in treating this pain. Studies like this one provide a richer understanding of the lived experience with chronic neuropathic pain and offer implications for the health care team treating these individuals.

### Supplementary Data

Supplementary data related to this article can be found online at <https://doi.org/10.1016/j.pmn.2018.09.007>.

### References

- Alvair, M. J., Hale, T., & Dungca, M. (2016). Pharmacologic interventions for treating phantom limb pain. *Cochrane Database for Systematic Reviews*, (12), CD006380.
- American Diabetes Association. (2016). Statistics about diabetes. Retrieved from: <http://www.diabetes.org/diabetes-basics/statistics/?referrer=https://www.google.com/>. (Accessed 1 May 2017).
- American Diabetes Association. (2014). The burden of diabetes in North Carolina. Retrieved from <http://main.diabetes.org/dorg/PDFs/Advocacy/burden-of-diabetes/north-carolina.pdf>. (Accessed 15 April 2017).
- Amputee Coalition. (2017). Limb loss statistics. Retrieved from <http://www.amputee-coalition.org/limb-loss-resource-center/resources-filtered/resources-by-topic/limb-loss-statistics/limb-loss-statistics/>. (Accessed 1 April 2017).
- Anderson, D. R., Roubinov, D. S., Turner, A. P., Williams, R. M., Norvell, D. C., & Czerniecki, J. M. (2017). Perceived social support moderates the relationship between activities of daily living and depression after lower limb loss. *Rehabilitation Psychology*, 62(2), 214–220.
- Beattie, A. M., Campbell, R., & Vedhara, K. (2014). 'Whatever I do it's a lost cause.' the emotional and behavioral experiences of individuals who are ulcer free living with the threat of developing further diabetic foot ulcers: A qualitative interview study. *International Journal of Public Participation in Health Care & Health Policy*, 17(3), 429–439.
- Bosmans, J. C., Suurmeijer, T., Hulsink, M., van der Schans, C. P., Geertzen, J. H., & Dijkstra, P. U. (2007). Amputation, phantom pain and subjective well-being: A qualitative study. *International Journal of Rehabilitation Research*, 30, 1–8.
- Coffey, L., Gallagher, P., Horgan, O., Desmond, D., & MacLachlan, M. (2009). Psychosocial adjustment to diabetes-related lower limb amputation. *Diabetes Medicine*, 26(10), 1063–1067.
- Colaizzi, P. F. (1978). Psychological research as the phenomenologist views it. In R. S. Valle, & M. King (Eds.), *Existential phenomenological alternatives for psychology* (pp. 48–71). New York: Oxford Press.
- de Godoy, J. M. P., Braille, D. M., Buzatto, S. H. G., Longo, O., & Fontes, O. A. (2002). Quality of life after amputation. *Psychology, Health & Medicine*, 7(4), 397–400.

- de Oliveria, G. C., & Boemer, M. R. (2007). Amputation in the perception of those who experience it: A study under the phenomenological view. *Revista Latino-Americana De Enfermagem*, 15(2), 330–336.
- Della, L. J., Ashlock, M. Z., & Basta, T. B. (2016). Social constructions of stigmatizing discourse around type 2 diabetes diagnoses in Appalachian Kentucky. *Health Communication*, 31(7), 806–814.
- Diabetes North Carolina. (n.d.). Facts. Retrieved from <http://www.diabetesnc.com/facts.php>.
- Ephraim, P. L., Wegener, S. T., MacKenzie, E. J., Dillingham, T. R., & Pezzin, L. E. (2005). Phantom pain, residual limb pain, and back pain in amputees: Results of a national survey. *Archives of Physical Medicine Rehabilitation*, 86(10), 1910–1919.
- Evans, C. B. (2013). Content analyses of a priori qualitative phantom limb pain descriptions and emerging categories in mid-southerners with limb loss. *Rehabilitation Nursing*, 39, 207–215.
- Hein, S. F., & Austin, W. J. (2001). Empirical and hermeneutic approaches to phenomenological research in psychology: A comparison. *Psychology Methods*, 6(1), 3–17.
- Hoffman, M. (2013). Bodies completed: On the physical rehabilitation of lower limb amputees. *Interdisciplinary Journal for the Social Study of Health, Illness and Medicine*, 17(3), 229–245.
- Hsu, E., & Cohen, S. P. (2013). Postamputation pain: Epidemiology, mechanisms, and treatment. *Journal of Pain Research*, 6, 121–136.
- Kato, A., Fujimaki, Y., Fujimori, S., Izumida, Y., Suzuki, R., Ueki, K., Kadowaki, T., & Hashimoto, H. (2016). A qualitative study on the impact of internalized stigma on type 2 diabetes self-management. *Patient Education and Counseling*, 99(7), 1233–1239.
- Kern, U., Busch, V., Muller, R., Kohl, M., & Birklein, F. (2012). Phantom limb pain in daily practice—still a lot of work to do! *American Academy of Pain Medicine*, 13, 1611–1626.
- Knezevic, A., Salamon, T., Milankov, S., Ninkovic, M., Knezevic, J. A., & Todorovic, T. S. (2015). Assessment of quality of life in patients after lower limb amputation. *Medicinski Pregled*, 68(3–4), 103–108.
- Knotkova, H., Cruciani, R. A., Tronnier, V. M., & Rasche, D. (2012). Current and future options for the management of phantom-limb pain. *Journal of Pain Research*, 5, 39–49.
- Kuffler, D. P. (2018). Origins of phantom limb pain. *Molecular Neurobiology*, 55(1), 70–84.
- Livingstone, W., Van De Mortel, T. F., & Taylor, B. (2011). A path of perpetual resilience: Exploring the experience of a diabetes-related amputation through grounded theory. *Contemporary Nurse*, 39(1), 20–30.
- Monsivais, D. B. (2013). Decreasing the stigma burden of chronic pain. *American Association of Nursing Practice*, 25, 551–556.
- Wooden, S. R. (2017). Chronic postsurgical pain. *Annual Review of Nursing Research*, 35, 91–115.