Birth, Postpartum, and Home Experiences of Individuals With Lower Extremity Nerve Injury

Martha Rider Sleutel, Patricia Newcomb, Ericka Valdez, Daniela Coates & Regina Wilder Urban

ABSTRACT

Objective: To explore birth and at-home postpartum experiences of individuals with lower extremity nerve injury (LENI) related to childbirth.

Design: Mixed-methods, descriptive, cross-sectional survey with open-ended questions.

Setting: Closed Facebook support group.

Participants: Two hundred-thirty individuals who experienced LENI during childbirth.

Measurements: Two research team members developed the online LENI survey that incorporated suggestions from LENI support group leaders. We used descriptive statistics, linear regression, and Kaplan–Meier survival curves to summarize the quantitative data and used content analysis for open-ended items.

Results: We described labor, birth, and postpartum characteristics in our sample, including immediate and long-term LENI symptoms. Falls resulting from LENI were common in the hospital (55.6%) and at home (75.6%). At discharge home, respondents reported low confidence in their ability to care for themselves and their infants as well as high levels of dependence on others. There was an 89.6% prevalence of depression in the first month at home. Approximately 80% of participants rated their degree of healing at 5 years as 80% to 100% healed. Content analysis yielded six themes: (a) *Grieving Loss of Current and Future Life*; (b) *Caregiver Responses That Helped or Hindered*; (c) *Being in Danger*; (d) *Experiencing Emotional Turmoil*; (e) *Dealing With Family, Marital, and Financial Difficulties*; and (f) *Finding Strength, Overcoming Obstacles, and Experiencing Personal Growth*.

Conclusion: Participants in our sample reported a very high rate of falls, anxiety, and depression at home. Nurses should recognize LENI symptoms, take action to prevent falls, and offer accurate information and referrals.

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CLINICAL IMPLICATIONS

- Nurses and other care providers should work to promptly identify lower extremity nerve injury when individuals experience numbness and mobility impairments lasting more than 2 to 4 hours after birth.
- Safety concerns in the hospital and at home include a high incidence of falls and potential for dropping the newborn.
- Those with LENI can experience significant emotional turmoil, including fear, hopelessness, frustration, anxiety, and depression.
- Caregivers should believe individuals' accounts of their experiences, answer their questions, and address their concerns with empathy and kindness.
- Fear of a repeat injury can influence an individual's choice of whether to pursue future pregnancies.

Lower extremity nerve injury (LENI) is a neurologic injury that can occur during childbirth from nerve compression or overstretch due to labor and birth positioning. This injury occurs with prolonged knee or thigh flexion from squatting, the lithotomy position, or the use of stirrups when the knees/thighs are pulled back and hyperflexed for pushing. It is more common with neuraxial analgesia (e.g., epidural), which masks warning signs of numbness or pain. Symptoms range from mild weakness to complete paralysis in the affected extremity or extremities. Depending on the nerve affected, individuals may experience foot drop; inability to walk; and, less commonly, bladder or bowel dysfunction (Association of Women's Health, Obstetric and Neonatal Nurses [AWHONN], 2020; Harper et al., 2020; Sleutel et al., 2020; Tournier et al., 2019; Wong et al., 2003). Symptoms are often evident immediately after birth and may be ignored when caregivers erroneously believe that persistent numbness is from the epidural. These impairments may last weeks, months, or years or may persist permanently.

There is limited research on LENI, yet rates may be as great as rates of obstetric hemorrhage, shoulder dystocia, or venous thrombus embolus (AWHONN, 2020). LENI affects 0.3% to 2.3% of births. Nerve injuries can occur in vaginal births or cesarean births or any surgery involving stirrups and/or flexion of the hips and knees. Treatments typically include physical therapy (PT) and the use of assistive devices, such as walkers. LENI can have devastating effects on individuals' lives, and little is known about their hospital care, home experience with their newborns, quality of life, coping methods, treatments, or outcomes. Prevention requires careful positioning and frequent repositioning of the legs and hands (AWHONN, 2020; Harper et al., 2020; Sleutel et al., 2020; Wong et al., 2003). Therefore, the purpose of this study was to explore birth and postpartum experiences of individuals experiencing LENI related to childbirth. Specific aims included the following: (a) to describe selected factors found in individuals with LENI related to labor and birth and (b) to explore these individuals' experiences with symptoms, diagnosis, treatments, therapies, methods of coping, and quality of life.

Martha Rider Sleutel, PhD, RN, CNS, C-EFM, is a nurse scientist at Texas Health Arlington Memorial in Arlington, TX. **Patricia Newcomb,** PhD, RN, is a nurse scientist at Texas Health Resources in Arlington, TX. **Ericka Valdez,** BSN, RN, RNC-OB, is a labor and delivery staff nurse at Texas Health Presbyterian Hospital Denton in Denton, TX. **Daniela Coates,** BSN, RN, is a mother–baby staff nurse at Texas Health Arlington Memorial Hospital in Arlington, TX. **Regina Wilder Urban,** PhD, RN, NPD-BC, CNE, MA-LPC, is a nurse scientist at Texas Health Arlington Memorial in Arlington, TX. **Address correspondence to**: ReginaUrban@texashealth.org.

Methods

For this descriptive study, we used a cross-sectional survey with convenience sampling in a closed Facebook support group of individuals worldwide who experienced LENI from childbirth ("Moms With Femoral/Peroneal/Sciatic Nerve Damage From Labor/Delivery"). Two PhD researchers developed the LENI survey to describe individuals' experiences during the following periods: (a) pregnancy and birth, (b) postpartum hospitalization, (c) first days or weeks at home, and (d) months or years after the birth. Administrators of the support group requested research on this topic and provided input into item topics and wording. With this feedback, the research team created the final LENI survey version. Closed-ended items used visual analog scales, Likert-type responses, and multiple-option responses. Open-ended items allowed participants to clarify or elaborate on their responses. Content and thematic analysis of text narratives added perspective to numeric data analysis findings. The number of questions varied depending on the respondents' experiences (how many births, for instance), but there were 82 main items with many additional opportunities for respondents to provide narrative descriptions. The survey took approximately 45 to 60 minutes to complete.

After review and approval by our institutional review board, we invited respondents to participate in the study by posting a description of the research project on the Facebook support group page. Those who wished to participate clicked on a link to the online LENI survey. Responding to the survey implied consent to participate in the study.

Data from the online survey were collected and managed using REDCap (Research Electronic Data Capture) and then exported into a statistical program (IBM SPSS Statistics for Windows, version 26) to perform statistical analyses. An a priori power analysis was not done because the number of active support group members was unknown. Our objective was to include as many individuals as wished to participate. Post hoc power analysis indicated that $N = 90$ was sufficient to perform the linear regression (NCSS Statistical Software, 2021).

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Missing data were judged to be missing at random except for details about epidurals and ease of obtaining PT. In these cases, missing data were due to not receiving the target therapies. Up to 16% of data regarding epidurals was missing, and 12% of data regarding obtaining PT was missing. When this occurred, cases with missing variables were dropped from analyses. Linear regression was used to detect significant associations between depression and postdischarge confidence and dependence. A Mann–Whitney *U* test was used to determine whether there was a difference in pushing time between reinjured and uninjured individuals.

For open-ended comments and longer narratives, we used an inductive, reflexive thematic analysis approach to first code and then develop themes (Braun & Clark, 2014). After immersion in the narratives, one author created initial codes and overarching themes. Coauthors followed the same process, with similar results, allowing consensus on the themes. Our convergent design (Creswell & Clark, 2018) integrated quantitative and qualitative data.

> Lower extremity nerve injury (LENI) is a neurologic injury that can occur during childbirth from nerve compression or overstretch due to labor and birth positioning

Results

A total of 230 individuals completed the survey, but not all respondents answered every question. Of 226 participants providing birth location, the majority ($n = 197$, 87.2%) gave birth in the United States. Twelve births (5.3%) occurred in the United Kingdom and Ireland, nine (4%) occurred in Canada, three (1.3%) in New Zealand, and two (0.9%) in Sweden. Other countries represented were Israel, Nigeria, and Germany, with one respondent (0.4%) from each. Almost all individuals ($n = 225$, 97.8%) gave birth in hospitals, although two were in birth centers and two were at home. At the time of survey, there were approximately 1,500 support group members, and it is unknown how many continue to participate in the group. Response rate can be calculated only with a defined sample group. With Facebook groups, some listed members may no longer remain in the group, and this occurs in this support group when members' conditions improve. Nonparticipating members who did not see the survey link did not have an opportunity to participate. The support group moderators identified that there were approximately 600 "views" of the survey post, suggesting a response rate of approximately 38.3%. Using the total number of 1,500 members, including those who did not see the survey invitation or have an opportunity to participate, would provide a response rate of 15.5%.

TABLE 1 MOBILITY RATINGS

Attribute	Mean (*SD*)
Early labor (<4 cm dilated, regardless of analgesia)	6.1 (3.7)
Rating: 0 = *stayed in bed and did not change positions*, 5 = *stayed in bed and changed positions every 15–30 minutes*, and 10 = *was out of bed and able to walk around*	
Epidural mobility during labor	2.2 (2.0)
Rating: 0 = *no mobility at all* to 10 = *complete mobility*	
Second stage mobility (regardless of analgesia/anesthesia)	3 (1.7)
Rating: 0 = *unable to move legs or hips at all (dead weight)* to 10 = *complete movement of both legs and could lift hips off bed*	

Patient, Labor, and Birth Factors in Individuals With LENI

Most respondents (80.3%) experienced LENI with their first birth. At the time of the survey, almost a fourth of injuries had occurred within the past 12 months, and almost a fifth had occurred more than 5 years ago, with a range of 1 month to 23 years. The shortest labor was 2 hours, and the longest was 96 hours. The mean length of labor for nulliparas was 20.8 hours (median = 19 hours, $SD = 11.8$), whereas multiparas' mean labor length was 11.7 hours (median = 10.8 hours, $SD = 6.9$). Almost half of the individuals had their labors induced, and more than 90% received epidural analgesia during labor. Supplementary Table S1 provides labor and birth characteristics in the sample. Individuals receiving epidural analgesia/anesthesia received their labor epidural at an

TABLE 2 INPATIENT ASSISTIVE DEVICES, INPATIENT REFERRALS, AND DIAGNOSTIC TESTING

Attribute	*n* (%)
Assistive devices	
None offered	48 (20.9)
Walker	138 (60.0)
Wheelchair	98 (42.6)
Shower chair	67 (29.1)
Knee or ankle brace	42 (18.3)
Walking cane	19 (8.3)
Inpatient referrals	
None offered	28 (12.2)
Anesthesia	155 (62.2)
Physical therapy	143 (3.0)
Occupational therapy	42 (18.3)
Neurology or neurosurgery	7 (1.7)
Orthopedics or orthopedic surgery	4 (6.5)
Pain management	4 (6.5)
Diagnostic testing	
None offered	138 (60.0)
Magnetic resonance imaging	71 (30.9)
Computed tomography scan	19 (8.3)
Nerve conduction study	11 (4.8)
Electromyography	7 (3.0)

Note. Percentages within each category do not equal 100 because of multiple tests, referrals, or assistive devices.

average of 4.5 cm dilated (median = 5 cm, *SD* = 2.1). In early labor, regardless of labor analgesia, study participants indicated they had moderate levels of mobility. Respondents who received an epidural during labor and those in the second stage, regardless of analgesia, indicated minimal ability to move their lower extremities (see Table 1).

Pushing Positions and the Second Stage

Overall, 215 participants reported experiencing second stage labor. (Some individuals with cesarean births did not push.) Of those, almost all pushed on their backs, often using or alternating with different variations and combinations of positions. Most individuals kept their legs pulled back continuously or almost continuously while pushing (see Supplementary Table S1). About half of participants' comments indicated that nurses or others were holding or pushing their legs back. A third reported their legs being pulled or pushed back as far as possible ("knees almost touching my ears" and "Legs were so far back they were almost behind my head"). A few (7%) individuals used less common positions, such as squatting, standing, or pushing on hands and knees. Some added text about hyperextended and/or abducted positions, such as frog leg, feet on birthing bars, or using ropes/towels in a horizontal squatting position. Some narratives described nurses' and sometimes their own creative positioning to aid birth progress. Almost half (47.9%) of nulliparas pushed for 3 hours or longer, compared with 12.2% of multiparas who pushed for 3 hours or longer. Most (87.5%) respondents gave birth vaginally, and 21.3% of those were instrumental vaginal births (see Supplementary Table S1). Two of the 230 LENI births were twins, with one set of twins born spontaneously and the other set by vacuum extraction.

Experiences of LENI After Birth and at Home

Almost 60% of respondents realized there was a problem within 1 to 3 hours of birth, and 90% did so within 12 hours of birth. Only 3.5% of respondents failed to notice their injury before 24 hours after the birth. In comments about their initial symptoms, these individuals recounted being unable to move or walk and described persistent numbness, inability to move, pain, and paresthesias (such as pins and needles). Other descriptions included weakness, coldness, or swelling. In describing initial symptoms, about a third of individuals wrote about falling or collapsing and not being able to walk unassisted. The right leg and/or foot was affected in 62 individuals (27.2%), and the left leg and/or foot was affected in 80 individuals (35.1%). In 86 individuals (37.7%), both lower extremities were affected.

After birth, as soon as they sensed a problem, these individuals notified their caregivers, usually within 1 to 3 hours and 90% within 12 hours. Approximately half first told the nurse who cared for them during labor, and a third first told the nurse who was providing postpartum care. Sixteen individuals (7%) told their physicians or nurse-midwives, and five (2.2%) told anesthesia personnel. The person initially notified seems to reflect who was providing direct care at that time. Three respondents shared in their comments that they knew something was wrong while they were pushing and told their caregivers at that time.

Caregiver Responses

Participants reported experiences of caregiver denial, disbelief, or dismissal of their symptoms when they reported persistent numbness and mobility problems. They felt that their concerns and fears were discounted and noted caregivers' lack of urgency. Of 206 comments, 198 described their symptoms being blamed on the epidural wearing off slowly, and most were told their symptoms of persistent numbness and inability to move were normal, even after 12 to 24 hours. In addition, nurses and physicians offered other potential causes. "They said it was due to water retention,"

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and conversely, "They kept telling me to drink more water to flush it out of my system. I drank so much water I felt like I was drowning." Several respondents related that care providers told them to calm down or that they were overreacting. Some blamed their continuing symptoms on emotional responses.

> Caregivers should work to anticipate and prevent falls by evaluating to what extent individuals can bear weight before getting them out of bed, even with assistance

Many described being told to get up and walk, despite explaining their numbness and their fear of falling ("I was told to walk more and move so I'd be less stiff") and being told to get up and go to the bathroom ("I said I couldn't move my legs. RN [registered nurse] said something like 'Oh, that will wear off, you just need to get them moving.' Doubtfully, I tried. I slid off the bed and collapsed in a heap on the floor"). By contrast, some participants recounted nurses' and physicians' advocacy for them—how they took their concerns seriously and how nurses escalated their situation by calling physicians to come evaluate ("The nurses were amazing and very comforting"). Almost all comments about symptoms 24 hours after birth indicated no change or improvement. In addition to lack of or impaired ability to feel or move, other symptoms were pain, pins and needles or tingling sensations, swelling, and coldness.

Inpatient Postpartum Care and Referrals

More than half of respondents (55.6%) fell during their hospitalization because of weakness or numbness from LENI. Forty-two individuals (18.8%) fell twice, and 15 (6.7%) fell three or more times. In their comments, 44 participants wrote that they fell or almost fell in the first few hours after birth, including one who had a cesarean birth and two who were further injured (one leg fracture and one back injury). Many others conveyed nearly falling, where they almost fell or were carried/supported by their visitors/partners. With their mobility impaired in the hospital before discharge, assistive devices were needed to safely get out of bed, and these were offered to most individuals (see Table 2). Approximately 70% of participants received referrals or consults with specialists.

Half of respondents ($n = 109$, 48.7%) reported that their birth provider did not know about nerve damage from childbirth, 45 (20.1%) indicated that their providers knew about it, and the remaining third did not know if their providers knew. Of 144 participants' comments, 82% ($n = 118$) recounted experiences of getting no information at discharge and/or having to self-advocate to get help and referrals. One third of respondents' care providers provided no information about prognosis, symptom duration, and management.

Home Experience

All 144 open-ended comments about individuals' experiences when they got home from the hospital described their difficulties and/or inability to care for themselves, their newborns, or their families. Narratives also included feelings of helplessness, dependence on others, isolation, and safety concerns/danger: "I could not get to my home . . . without being carried." "It was hell. My world was completely rocked. . . . I [could not] care for myself or my son. I was completely dependent on family for a [long] time. I felt like a complete failure and my journey was just beginning."

Most went home with walkers, shower chairs, or other assistive devices (see Table 2). Despite having mobility aids, of 223 respondents, the overwhelming majority (75.8%, $n = 169$) fell while at home, and half of those (49.7%, $n = 84$) fell three or more times. Only 54 individuals (24.2%) did not fall at home. One woman remembered, "I fell down the stairs because my knee buckled, and I severely broke my foot. This was only days after coming home from the hospital. I had to have surgery and was non–weight-bearing for weeks. It was awful."

Diagnosis

Some participants reported never receiving an official diagnosis, but most were diagnosed in the hospital or 1 to 3 months after the birth. Participants reported various methods and combinations of methods to diagnose their condition. Neurologists were the most common provider who diagnosed LENI, whereas very few birth providers diagnosed it. Respondents reported receiving various treatments, singly or in combination, in the days, weeks, and months after the birth injury (see Supplementary Table S2). Most individuals received PT, rated it somewhat easy to get a PT referral, and indicated that PT was very helpful to their recovery.

Comments about the health care provider who diagnosed their condition. Participants recalled varied experiences with being diagnosed. A few individuals wrote details about how their providers had never heard of the condition: "Neurologist was completely baffled," "Not one doctor had seen this damage before," and "Googled it online, he had no idea." They mentioned advocating for themselves: "I diagnosed myself, honestly." Several respondents wrote that it took years to get a diagnosis. Comments for this question again revealed individuals' feelings of being frustrated; being discounted/minimized; and receiving minimal or no help, information, or care instructions. However, other respondents identified excellent care and expressed gratitude and relief: "Fantastic neurologist. . . . He was brilliant and knew right away what was wrong." "I was diagnosed by a different OB/GYN [obstetrician/gynecologist] when I was considering whether or not to have another child."

Pain

Almost half of 219 respondents answering this question ($n = 108$, 49.3%) reported nerve pain, and of those, 59 (54.6%)

TABLE 3 FEELINGS OF DEPRESSION IN THE FIRST POSTPARTUM MONTH

Related Variables	Unstandardized *B* Coefficient	Standard Error	*t* Value	*p* Value	95% Confidence Interval
Confidence in your ability to take care of your baby when you were discharged from hospital.	–0.209	0.081	–2.579	.011	–0.369 to –0.049
During the first days at home with your baby, how dependent were you on family or friends?	0.316	0.120	2.621	.009	0.078 to 0.553

received treatment. The remaining 49 (45.4%) individuals did not receive treatment and did not know how to get help for it. Participants described their pain as burning, searing, cramping, aching, shooting, spasms, twitching, tingling, pinched feeling, pins and needles, electric shocks, throbbing, and extreme skin sensitivity. Representative comments included the following: "After a couple weeks of just numbness and tingles, the excruciating pain came, and it was honestly worse than contractions and childbirth. I cried and cried for days." ". . . It was like a constant Taser/electrocution to my foot." "I didn't think anything would be more painful than birth, but I was wrong." "Very intense pain to the point of being nearly unmanageable. Just the bed sheet brushing my big toe would send me into hysterics. At first my foot was unbearably cold, then several weeks later this changed to unbearably hot. Nerve pain is not like ordinary pain, it is indescribable." Various medications were used, including opioids/narcotics, nonsteroidal anti-inflammatory drugs, acetaminophen, gabapentin, pregabalin, magnesium, vitamin B6, topiramate, steroids, topical anesthetics, and topical cannabidiol. Nonpharmacologic treatments included heat, cold, stretches, baths, meditation massage, acupuncture, and hydrotherapy.

Emotions

Almost all comments about home experiences included fear—of falling, of dropping the newborn, of not being able to walk again, and of future pregnancies. "I feared whether I would ever walk independently. I worried constantly. Nobody had answers." "Seventeen years later, it is still emotional and difficult. That fear that I would never walk again, have more children, be able to work, has lightened . . . but the emotion and trauma of what occurred is still present." "It was so scary, terrifying."

Some individuals felt abandoned or betrayed by their health caregivers. "Angry, scared, sad, terrified, disappointed. I felt completely abandoned by my medical team and just like I was passed off on someone else to be 'someone else's problem.'" Others expressed self-blame. "I felt like I had made a mistake during delivery. I felt like an inadequate mother." Respondents were frustrated with unrealistic expectations that they could access outpatient services when they couldn't drive and couldn't walk. "I was trying to manage my own referrals and advocate for my care while also parenting a 4-year-old and breastfeeding a newborn. I had endless arguments with insurance to get home PT visits as I could not drive to PT." "It was in the dead of winter, lots of snow, and I had to navigate pediatrician visits using crutches on icy snowy walkways."

Respondents wrote of being grief-stricken and angry at "being robbed" of the happy experience they expected. These strong negative feelings mixed with similar feelings of happiness with their infants. "Such joy over my precious child, but such sorrow and fear that I couldn't care for her or myself". "What should have been the best time of my life turned into an experience that I cry even thinking about."

Depressed mood after returning home with the newborn was common among individuals in this sample, who reported feeling depressed or down 60% to 70% of the time on average during the first month postpartum (Table 3). Of the individuals who reported feeling depressed in their first few days or weeks at home, 52.4% did not tell a health care provider of their feelings. In their written comments, participants described their emotional experience going home as terrifying, frustrating, confusing, and overwhelming. They wrote of their despair, worry, sadness, and feelings of hopelessness and uselessness. "I cried because I hurt, I cried because I had to wait a month to get into PT, I cried because I could barely take care of myself, let alone my baby." "It caused long term mental health issues with depression and anxiety." "Complete depression. I felt incapable and worthless. I needed so much help." On a scale of 0 to 10, respondents rated their ability to care for themselves and their newborns on the day of discharge home as low (mean = 2.2 and 2.5, respectively). Their ratings of level of dependence on friends and family in the first few days at home were high (mean = 8.8; see Table 4).

Using multivariable linear regression, we found that confidence in one's ability to care for a newborn and dependence on friends or family during the first few days at home were significantly associated with time feeling depressed in the

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TABLE 4 RATINGS OF CONFIDENCE, DEPENDENCE ON OTHERS, AND DEPRESSION

Attribute	Mean (*SD*)
Confidence in ability to take care of herself on the day of discharge **Rating: 0 = *no confidence at all* to 10 = *complete confidence***	2.2 (2.3)
Confidence in ability to take care of her newborn on the day of discharge **Rating: 0 = *no confidence at all* to 10 = *complete confidence***	2.5 (2.6)
Dependence on friends and family in the first few days at home **Rating: 0 = *not at all dependent* to 10 = *completely dependent***	8.8 (1.7)
Emotionally "down" or depressed in the first month at home with the infant **Rating: 0 = *not at all depressed* to 10 = *depressed 100% of the time***	6.3 (2.5)

first postpartum month, as shown in Table 4, although the effects were relatively small (adjusted $r^2 = 0.11$, $df = 206$).

Degree of Healing Over Time

One question asked individuals to categorize how much they had improved at different time periods after their injury. By 6 months, most respondents (70%) were 60% to 100% back to their preinjury levels, and by 1 to 1.5 years, more than half (61%) were 80% to 100% healed. At five years, approximately 80% were 80% to 100% healed (see Figure 1). "I took my first step without the walker at 5 months. I am 10 years out and still have pain to the touch. . . ." "I think it's really important to understand that talking about how 'healed' nerve injuries are a really difficult thing to assess. The leg is HUGE. It's a pretty big and major body part that had zero ability to function. So even with 90% healed, 10% of a leg not working is still quite significant."

Respondents' nerve injuries occurred from 1 month to 23 years before the survey, and they reported their degree of healing at the time of the survey. Participants reported a mean of 80.3% and a median of 89% healed or returned to their prior level of functioning. Only 108 individuals reported achieving 90% to 100% of their prior function. Using a Kaplan–Meier survival table (Kaplan & Meier, 1958), we calculated the mean time to achieve 90% to 100% preinjury health to be 6.35 years ($SE = 0.679$) and the median to be 4 years ($SE = 0.036$). By 4 years, only half had achieved their preinjury level of health. We also explored factors that were associated with degree of healing and found that the more mobility mothers had during early labor, the greater their degree of healing/return to normal ($p = .035$). Individuals who received electrical stimulation therapy after injury were more likely to have higher scores on returning to previous health state (holding other factors constant; $p = .006$).

Forty-one respondents described their symptoms after 5 years, and 4 of them reported being completely healed. Of the remainder, 15 reported mobility issues, and 19 reported continued pain and other sensory problems, with nine individuals describing pain/sensory and mobility problems combined. Four individuals wrote of ongoing health problems and surgical repairs, three of which were related to injuries from multiple falls. Of the 179 participants who had planned to return to work, 33.5% were able to return to work as scheduled, 53.6% were delayed in returning to work, and 12.9% could not return to work at all.

Nerve Injury in Subsequent Births

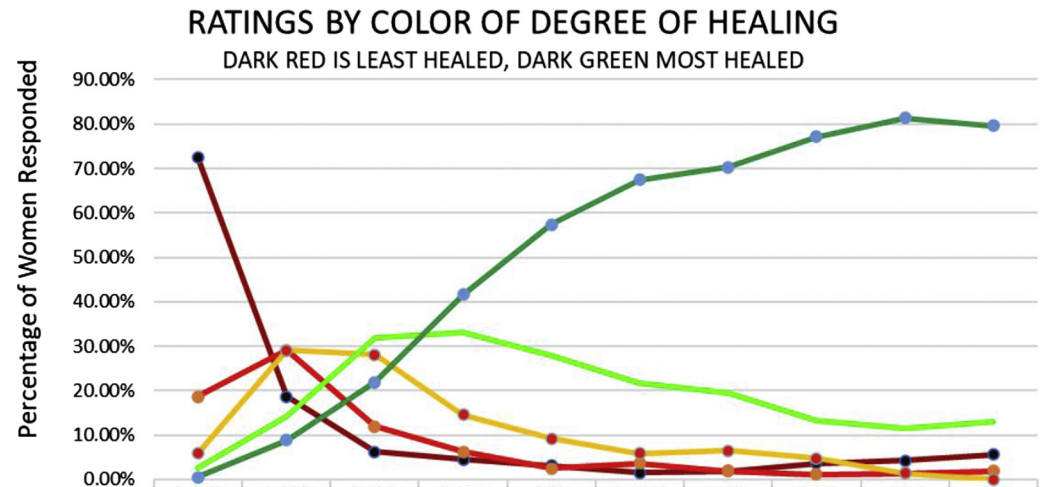
Fifty-seven respondents had subsequent children after being injured, and four (7%) were injured or reinjured, whereas 93% were uninjured. More than half ($n = 34$, 57.6%,) had a spontaneous vaginal birth, one (1.7%) had a forceps birth, and 24 (40.7%) had cesarean births. Of the four who were reinjured, two individuals had a spontaneous vaginal birth, one had a forceps birth, and one had a cesarean birth. The noninjury rate was 93.8% for spontaneous vaginal, 0% for forceps, and 95.8% for cesarean births. Of 56 participants who answered the question, 36 (64.3%) had an epidural, and 20 (35.7%) did not. Individuals with epidurals had an 8.3% reinjury rate compared with 5% reinjured without an epidural. There was no statistically significant difference in pushing time between reinjured and uninjured individuals (Mann–Whitney $U = 249$, $p = .088$).

Results of Thematic Analysis

Synthesizing narrative comments from throughout the different aspects of the survey yielded six major themes and some subthemes. *Grieving Loss of Current and Future Life* was an overarching topic area that included many losses—of normal function and abilities, of being pain free, of independence, and of the role as a spouse and mother. It also included the lost motherhood experience: "I will always mourn those first few months I felt like I couldn't enjoy my babies and take care of them the way I should have been able to." "I learned to walk on what felt like numb stubs. . . ." "I could not carry my own baby for months until I had the leg braces." Respondents further reported loss related to body image due to having a limp, using a walker or other assistive devices, or weight gain from immobility.

The theme of *Caregiver Responses That Helped or Hindered* included negative responses of providers blaming other providers and dismissing or discounting symptoms and concerns. "When I could not feel or move my left leg, the doctor thought I had postpartum depression." "When my mother arrived, [the

FIGURE 1 **RATINGS OF DEGREE OF HEALING OVER TIME**



	1 MO	3 MO	6 MO	9 MO	1YR	1.5 YR	2 YR	3 YR	4 YR	5YR
0-%19%	72.50%	18.70%	6.20%	4.50%	3.10%	1.50%	1.90%	3.60%	4.30%	5.60%
20-39%	18.60%	29.10%	12%	6.20%	2.50%	3.60%	1.90%	1.20%	1.40%	1.90%
40%-59%	5.90%	29.10%	28.10%	14.60%	9.20%	5.80%	6.50%	4.80%	1.40%	0
60%-79%	2.50%	14.20%	31.80%	33.10%	27.80%	21.70%	19.40%	13.30%	11.50%	12.90%
80%-100%	0.50%	8.90%	21.90%	41.60%	57.40%	67.40%	70.30%	77.10%	81.40%	79.60%

nurse] told her it may be in my head." Respondents also wrote of positive caregiver responses of kindness, accurate information, and appropriate care. "The nurse helped me to the bathroom and noticed (my limp). She got my doctor. She knew what it was and called in the neurologist and explained to me what she thought was going on."

Being in Danger was pervasive throughout the different sections of the survey, related to falling, fearing falling, and being unable to care for themselves. "I would fall multiple times a day." "I was terrified to be left alone with my children in case of an emergency. . . . I still fear that my damage will one day return. . . ." "I could barely take care of myself, let alone my baby." "I was scared to be alone with him. I was afraid that I would never walk again."

Experiencing Emotional Turmoil was also prevalent, with subcategories of (a) *Despair/Hopelessness*; (b) *Frustration and Feeling Overwhelmed*; (c) *Loneliness and Isolation*; (d) *Fear of Having Another Child*; (e) *Guilt, Failure, and Being Judged (Inability to Mother, to Breastfeed, to Care for Newborn, Uselessness)*; (f) *Anger and Betrayal*; and (g) *Gratitude for Improvements*. A sampling of quotes includes the following: "The darkest time of my life." ". . . most traumatic experience of my life." "I was severely depressed and crying for hours on end. I felt completely helpless." "I felt like I had burdened my whole family to take care of me and a newborn . . . I felt useless." "I felt like a prisoner in my own house." "I'm terrified to have another baby." "The mental toll this injury takes on a mom is horrible, and we suffer in secret. I thought I was alone."

The fifth theme was *Dealing With Family, Marital, and Financial Difficulties*. Individuals described their husbands being unable to work for months to provide care for them, having relatives move in with them, having to move to another house without stairs, and having further injuries and medical bills from falls. "The hardest time in my life and in my marriage. My husband and I, both, cried daily for the first 1 to 2 weeks." ". . . It changed my entire life. I cannot play [physical] games with my kids." "My husband had to be out of work for 3 months to care for me. If he went anywhere, he had to arrange care because we were afraid if something were to happen, I would not be able to act fast enough on my own."

The final theme was *Finding Strength, Overcoming Obstacles, and Experiencing Personal Growth*. Respondents recounted their transformations as their experiences changed their perspectives and life direction. "I vowed to use my legs like never before . . . seeing how resilient I can be when I need to is priceless." "A close friend had a stroke this past January and lost all movement on her right side for a while. My experience allowed me to relate and speak to her like no one else could." "I decided to pursue midwifery as a result of my injury."

Survey Reliability and Validity

The LENI survey was intended only to describe the labor, birth, hospital, and postpartum home experiences of individuals with LENI. It was not measuring a single underlying trait or construct and had numerous item formats, and many overlapping "select all that apply" responses often yielded

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categoric or nominal responses (type of labor, types of diagnostic tests, etc.). For these reasons, traditional reliability assessments (such as Cronbach's alpha) were not appropriate and could not be used. Because we could find no previous survey on this topic, we included many short-answer text sections for responses, which were categorized and quantified when possible. Construct validity was supported by asking support group leaders who experienced LENI themselves to review survey item topics. To further enhance accuracy and trustworthiness, we posted our six themes and subthemes into the support group, asking for feedback. Group members' responses affirmed and supported the themes and elicited more details and narrative accounts. Content and thematic analysis trustworthiness are also supported by the degree to which our quantitative evidence supported and confirmed qualitative findings.

> Nurses are in a pivotal position to help prevent LENI and to optimize detection, care, and outcomes when it does occur

Discussion

This cross-sectional survey illuminated the experiences of individuals who experienced nerve injury from childbirth. Participants wrote extensively and poignantly about their experiences and concerns. Respondents recounted having two burning questions: (a) When will I get back to normal?/Will I get back to normal? and (b) How can I have another birth without injury? They expressed an urgent desire to educate the public and health care professionals to prevent LENI and to ensure appropriate care when it does occur. Several respondents e-mailed research team members to offer additional details and even to send their birth videos if it might help improve care. Our results support existing literature on the importance of positioning during labor and birth. To our knowledge, our findings of high rates of falls and depression, in the hospital and at home, are new.

It is common during second stage pushing for individuals to pull their legs back and/or be positioned in stirrups. In this sample, many respondents maintained these positions throughout the second stage, during and between pushes and often with legs that were pulled/pushed back as far as possible. By contrast, recent recommendations are to avoid hyperflexed hips and knees and to change positions often (AWHONN, 2020; Harper et al., 2020; Sleutel et al., 2020; Tournier et al., 2019). Individuals, particularly those with epidurals, may benefit from straightening their legs between pushes. It is worth noting that two participants gave birth at home and were injured from prolonged extreme positions. These situations highlight the importance of careful and varied positioning, regardless of the venue or of having an epidural, to prevent LENI.

Individuals with LENI need considerable emotional support and information. Almost all survey participants reported feeling depressed at the time of their discharge home, and half did not tell their care providers of these feelings. The self-reported incidence of postpartum depression in U.S. individuals at 4 to 6 months postpartum is 13.2% (Bauman et al., 2020), and a worldwide meta-analysis of 58 studies showed that the incidence of postpartum depression was 12% and the prevalence of depression was 17% (Shorey et al., 2018). By contrast, in our sample, 89.6% of participants reported feeling depressed for the first month at home, suggesting that the incidence of depression in individuals with LENI after birth may be substantially greater than in the general population. According to Beck (2021), formal screening on the postpartum unit is too early, and more appropriate timing is during the antepartum and 4- to 6-week postpartum appointments. Nurses and care providers should offer anticipatory guidance about depression and have proactive conversations about seeking mental health support (Beck, 2021). Because we have no information about depression in our sample before childbirth, it is not possible to accurately calculate the incidence. However, an incidental finding of the study included the fact that high levels of feeling emotionally depressed at the time of completing the survey were strongly associated with lower scores on perceived degree of healing, with other factors held constant ($r = –0.398$, $r^2 = 0.80$, $p = .0001$). In our sample, 66.5% of those who planned to return to work delayed in returning to work or could not return to work at all.

Implications for Practice

Frequent position changes during labor, and especially while pushing, is a key strategy to prevent LENI. Nurses should follow recommendations to avoid positioning individuals with prolonged flexion of the hips and knees (AWHONN, 2020). Based on our survey results, nurses and physicians can anticipate that most individuals with LENI will report persistent numbness and inability to move within 1 to 3 hours of birth and may notice and call attention to a problem while pushing. Nurses who provide care during labor and birth tended to be the first ones notified, followed by nurses who provide care during the immediate postpartum period. Caregivers should be alert for sensory and mobility impairments and should not attribute symptoms to the epidural, especially 3 hours or longer after birth. Caregivers should believe individuals' accounts of their symptoms and take advocacy actions, such as immediately seeking referrals. Respondents wrote about nurses' advocacy, kindness, and support, indicating that these responses were valued and meaningful.

Inpatient falls were very common, with many respondents falling more than once and many more experiencing near misses; some who fell experienced additional injuries. Caregivers should anticipate and prevent falls by evaluating to

what extent individuals can bear weight before getting them out of bed, even with assistance. Individuals who can bear weight may still need substantial assistance and supervision. Providers should not encourage individuals to try to walk or get out of bed to "help the epidural wear off" and should follow fall prevention protocols. Respondents reported minimal to no improvement in symptoms before discharge, so caregivers can anticipate individuals remaining at greater risk for falls, continuing to have challenges caring for themselves or their newborns, and requiring considerable care throughout their hospitalization. Individuals with LENI may need assistive devices, such as shower chairs, walkers, wheelchair, and braces, in the hospital and at home. Falling at home was extremely common, and families should be warned about this safety issue. Nurses and providers should educate postpartum individuals and their families on the range of emotions they are likely to experience at home and initiate appropriate referrals, treatments, devices, support, and medication (AWHONN, 2020).

Regarding reinjury in subsequent births, our results show a very low reinjury rate. Of note, 10 months after our survey, the support group polled members about subsequent births, and of 79 respondents, none were reinjured (63.3% vaginal births and 36.7% cesarean births). Of the 29 cesarean births, 21 were planned or elective, and of the 50 vaginal births, 32 involved epidurals. To prevent reinjury, comments indicate that caregivers listened carefully, collaborated, were very careful with leg positions and avoided or minimized stirrups. Nurses and other care providers should provide education that that reinjury appears to be uncommon with subsequent vaginal or cesarean births if great care is taken with positioning.

Limitations

There are some limitations to this study. Individuals whose injuries were minor or resolved quickly may have left the support group, especially as they became busy with their growing infants and family and/or if they returned to work. Thus, there is a sampling bias toward those who have recent, more severe, long-standing, and/or unresolved injuries. Relying on individuals' memories about labor and birth, often years afterward, may not be reliable. We did not ask information that might be perceived as invasive, such as income, insurance coverage, ethnicity, age, or gender identity. Because almost all respondents were from highly developed countries, generalizability to other populations and beyond this specific group is not possible. Negative associations should be interpreted with the possibility that the study was underpowered to detect these events. Because there is no comparison group of unaffected individuals and our sample size was small, we could not quantify risk factors and were limited in inferences we could draw. Additionally, no psychometric properties are available for this investigator-developed survey. Despite these limitations, our findings were novel and offer a unique perspective.

Conclusion

Participants recounted how nerve damage from birth affected their lives and their families. They reported falls, depression, low confidence, and low ability to care for themselves, their newborns, and their families. Nurses are in a pivotal position to help prevent LENI and to optimize detection, care, and outcomes when it does occur. We hope that by describing a LENI population, we might help shed light on how to address participants' urgent concerns and questions. Although sampling and methodologic limitations restricted our results primarily to cataloging individuals' experiences, these findings provide new insights into strategies to improve care.

Supplementary Materials

Note: To access the supplementary material that accompanies this article, visit the online version of Nursing for Women's Health at http://nwhjournal.org and at https://doi.org/10.1016/j.nwh.2022.03.009.

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