


The Expressions of Hope in the Face of Complex Surgery: Experiences of Patients and Their Loved Ones

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Abstract

Background: Lung volume reduction surgery (LVRS), a reduction in damaged lung tissue in end-stage chronic obstructive pulmonary disease, is a breakthrough surgical procedure requiring months of rigorous screening, testing, and conditioning. Engaging in this process is prolonged and challenging with no research found exploring patients and loved ones' experiences through this demanding process. **Objective:** The purpose was to examine the experience of LVRS for patients and loved ones as they encounter the complex preparation required prior to, during, and throughout the extended convalescence following surgery. **Methods:** A mixed-methods approach was used, combining health outcomes with interview data. Participants and loved ones were purposefully selected, invited, and consented during the perioperative phase of LVRS. Quantitative data were obtained via chart review, while qualitative data were gathered through a 2-stage interview process, preoperatively and postoperatively. Qualitative data were analyzed using naturalistic inquiry approaches. **Results:** Patients and loved ones described difficulties of living with illness during the preoperative phase, and expressed relief and joy for an improved quality of life afterward. The overarching theme uncovered was hope. Preoperatively, hope was coupled with anxiety about the upcoming surgery and potential outcomes, whereas the hope expressed after surgery focused on the future, in particular, a shared future. Statistically significant differences were found in the quality of life measures. **Conclusion:** For both patients and loved ones, LVRS is filled with hope for a more expansive future. Although that future is unclear prior to surgery, clarification and a new normal signals hope for a shared future following LVRS.

Keywords

pulmonary disease, chronic obstructive, pulmonary surgical procedure, qualitative research, hope, pulmonary rehabilitation

Introduction and Statement of Purpose

Emphysema is commonly known as chronic obstructive pulmonary disease (COPD). It is a debilitating and progressive disease with the primary symptoms of shortness of breath and limited exercise tolerance, progressing to loss of function. The resulting dyspnea is a major contributing factor with overwhelming negative impact on quality of life, so that routine activities of daily living become a struggle (1–3).

Initial treatment is typically medically focused including bronchodilators, corticosteroids, long-term oxygen therapy, smoking cessation, and pulmonary rehabilitation (PR) (4). When disease management approaches have reached their

limitations, a select group of patients with COPD with these long-standing problems may be eligible for lung volume reduction surgery (LVRS; 4-6). Lung volume reduction surgery is a complex procedure reducing the patient's hyper-inflated lung volume by surgical resection. Surgery offers

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the opportunity to improve lung function and decrease dyspnea. Although LVRS does not cure the patient's illness, it may provide an improved quality of life, decreased oxygen requirement, and increased life satisfaction (1–3, 5–11). Lung volume reduction surgery is a delicate and difficult procedure for the patient requiring a lengthy workup phase with multiple appointments, assessments, and laboratory/diagnostic tests over several months. The surgery requires a prolonged hospitalization and an extended recovery and convalescence.

The workup, the surgery, and the recovery from LVRS require a major commitment for the patient and their loved one. Clinic appointments, engagement in PR, working through smoking cessation, and managing weight gains/losses, pain, and fatigue may all be required during this arduous process. Multiple encounters with nurses and other health-care professionals provide many opportunities for patient and family engagement in the overall program. Health-care professionals can bolster patients' and loved ones' perseverance as they move through the program. However, little is known about which nursing interventions are considered the most helpful to the patient and their loved one during this very challenging period of their lives (12).

The purpose of this mixed-methods nursing research study was to examine what it is like for a patient and their loved one to go through and experience the complex preparation required prior to LVRS, the surgery itself, and the extended recovery. There is little literature describing the patient and loved one's perspectives of LVRS. The goal of the study was to gain an understanding of the lived experience of LVRS throughout its phases in order to identify nursing interventions that can support adaptation to the rigorous preparation for, and experience of, LVRS surgery.

The research questions were:

1. What is it like for patients to experience preparation for LVRS?
2. What is it like for the loved one to experience the patient's preparation for LVRS?
3. What is it like for patients to experience LVRS and recover from LVRS?
4. What is it like for the loved one to experience the patient's LVRS and recovery from surgery?
5. What is the physiologic evidence, if any, which aligns with the patient's or loved one's report of experience with LVRS?

Review of the Literature

The databases of PubMed, CINAHL, and Ovid MEDLINE were searched for articles in the last 10 years using the terms of "LVRS," "patient experience," and "family experience." Less than 20 hits were produced with no articles including research regarding the experiences of families or loved ones.

Literature found included description of the surgery, requirements for the surgery, the role of PR, and patient outcomes.

Lung volume reduction surgery provides a surgical approach to managing the severe symptoms that accompany compromised lung diseases. Patients who have this surgery have a long-standing history of breathlessness and oxygen lack related to one or more kinds of severe, chronic respiratory diseases that are not curable. Although not curative, LVRS may improve dyspnea, quality of life, and satisfaction (5,7–11,13). Patients have multiple self-care management milestones (such as quitting smoking, or losing/gaining weight) to prepare their bodies for the surgery. They are required to meet specific criteria, set by Centers for Medicare and Medicaid Services (CMS) and based on the National Emphysema Treatment Trial (NETT), to be considered for LVRS surgery (14).

One CMS requirement is that patients complete a 6- to 10-week PR program prior to surgery to increase strength and endurance (8,15,16). According to CMS, NETT, and the Global Initiative on Obstructive Lung Disease workshop, PR is an effective approach for improving quality of life for patients with COPD. Pulmonary rehabilitation programs provide an interprofessional approach to help patients increase physical strength and endurance, improve exercise capacity, and decrease dyspnea. In addition, PR helps patients better understand their disease process and medical management including medication adherence, smoking cessation, oxygen use, and management of symptoms (14,17,18).

The PR team plays a key role in providing education and support to assist patients throughout the complex process of preparation for LVRS surgery, as well as the sometimes challenging recovery. Along with the physical benefits preoperatively, PR helps patients psychologically by providing encouragement to maintain smoking cessation, counseling on nutritional issues, and support to decrease patients' anxiety and depression (17–21). In the NETT trial, PR team evaluation of patient adherence to PR and their medical treatment, as well as assessment of patient's motivation and commitment to the rigorous preoperative requirements, were instrumental factors in the successful preparation for surgery (14,19).

This ramp-up of self-care management is lengthy, rigorous, and difficult, yet many patients successfully navigate this preparatory phase with the assistance of their loved one. Patients who are unable to complete this phase of preparation are not eligible for the surgery.

The surgical procedure itself is complex and requires an average hospital length of stay of 7 days, sometimes much longer. Recuperation is arduous; it may be 4 to 6 months before the patient is feeling more healed, and the same time may be required before some of the benefits of the surgery become more obvious (2,4). The commitment by the patient and the loved one to rehabilitation and recovery needs to be very high for successful navigation of this very difficult time. Despite the complexity of this surgery and healing

process, no studies have been done to examine what it is like to go through this process, for patients and for the loved one. This study sought to fill that knowledge gap.

Methods

A mixed-methods approach integrating qualitative and quantitative data was utilized to address exploratory and confirmatory questions. In mixed-methods research, both qualitative and quantitative data are collected and analyzed, and results are then integrated to evaluate relationships and provide further insight. Mixed-method approaches are often utilized to facilitate a deeper understanding of complex issues such as the quality of life or the experience of a chronic illness (22,23).

Recruitment

The local institutional review board approved the project prior to the outset of the study. Purposive selection from a convenience sample of patients and their designated loved one was chosen to gain the perspective of those who experienced LVRS. The LVRS coordinator recruited participants during an early clinic visit. If indicating an interest in the study and approval for LVRS was established, the patient and their designated loved one provided written informed consent. The LVRS coordinator recruited 15 dyads of patients and loved ones. Recruitment continued until data saturation was reached. All dyads were assigned to a case number to maintain anonymity.

Data Collection

Patients' demographic data, a pre- and post-36-item short form (SF-36) survey, and pre- and postpulmonary function tests were gathered; no quantitative data were collected on the loved one. The SF-36 is considered the gold standard for valid and reliable evaluation of patient quality of life with a reported Cronbach's α of 0.70 to 0.93 (21). The SF-36 surveys were mailed to the participants for completion prior to their surgery and at 6 months postsurgery. Pulmonary function testing was also completed on the patients prior to surgery and again at 6 months postsurgery as a routine part of patient care. Demographic information for the patient was obtained through record review and was only viewable by the principle investigator.

The qualitative portion of the study included separate semistructured phone interviews to ensure each participant in the dyad (patient and their designated loved one) felt free to speak in confidence. A skilled qualitative researcher performed all the participant interviews, which were scheduled at the participants' convenience. The interviewing researcher did not practice as a clinician, to preserve interview neutrality. A semistructured questionnaire (Table 1) guided the interviews. The baseline interviews occurred within a few days before the scheduled surgery, while the

follow-up interviews occurred 6 months later; all interviews were audio recorded for accuracy and professionally transcribed prior to analysis. Once the qualitative interviews were completed and the quantitative data gathered, all identifying demographics were removed by the principle investigator with only the case numbers remaining to distinguish the subjects.

Data Analysis

Quantitative. Simple paired *t* tests employing the Statistical Package for the Social Sciences (SPSS, version 23, IBM) were utilized to determine significant differences among participants' pre- and post-SF-36 survey responses.

Qualitative. After assuring the transcriptions were accurate, transcriptions were uploaded into NVivo (QSR International, version 10), a qualitative data analysis software that allows multiple researchers to evaluate the data; this allows researcher triangulation and assists in minimizing bias from entering the data analysis. Interview field notes, developed by the researcher, also provided data for analysis.

The number of interviews was based on the interviewer's determination of data saturation, which occurred after the 2-stage interviews of 11 dyads. Two research team members separately read each transcript line-by-line and coded the transcripts, placing these into nodes; nodes are NVivo's language for codes. Similar nodes were then grouped together into a parent node, or category. Parent nodes were then analyzed for common themes.

The 2 qualitative researchers verified congruence of their independent theme identification. The entire research team confirmed that the findings were grounded in the data by reading passages of the transcripts and validating the interpretation of nodes, parent nodes, and overall themes.

Results

Quantitative

Fifteen dyads (30 participants) consented to the study. Eleven patients and 8 loved ones completed the entire study. One dyad withdrew from the study, one participant died during recuperation from surgery, one participant did not complete the second interview, and one participant did not go through with the surgery. Of the subjects who completed the study, 55% were female and 45% were male. The majority of the participants (90%) were white and most were retired. The average age of the participant was 68 with a range of 59 to 75. Most participants (60%) did not have a college degree.

Paired *t* tests were conducted to compare pre- and postsurgery means of SF-36 quality-of-life responses. Significant differences were found between 28 of the 36 paired items (Table 2). Incomplete data did not allow statistical examination of the pre- and postsurgery pulmonary function tests.

Table 1. Interview Questions.

Patient Presurgery	Loved One Presurgery
<ul style="list-style-type: none"> • What was it like to live with your lung disease before you considered surgery? • Can you describe the process of making your decision to have this surgery? • What preparations were you asked to make to get ready for the surgery? • What does it feel like to prepare for this surgery? • What is it like waiting for this surgery while you are still at home? • Tell me about a time when a nurse was especially helpful to you or your loved one. • Can you think of something that the nurse could do to be helpful? • Describe what you think your loved one's experience is during this preparation for surgery. • What have we forgotten to ask you about preparation for the surgery? 	<ul style="list-style-type: none"> • What was it like to live with your loved one before s/he considered surgery? • Can you describe the process of making the decision to have this surgery? • What preparations were you asked to make to help your loved one get ready for the surgery? • What is it like to help your loved one prepare for this surgery? • What is it like waiting for this surgery while your loved one is still at home? • Tell me about a time when a nurse was especially helpful to you or your loved one. • Can you think of something that the nurse could do to be helpful? • Describe what you think your loved one's experience is during this preparation for surgery. • What have we forgotten to ask you about preparation for the surgery?
Patient Postsurgery	Loved One Postsurgery
<ul style="list-style-type: none"> • How long did you have to wait for your surgery once you completed preparations? • What was it like to have the surgery and the recovery in the hospital afterward? What preparations did you make for the time after surgery? • What was it like to go home after the surgery? • Describe how you feel now. • Tell me about a time when a nurse was especially helpful to you or your loved one during or after surgery. • Can you think of something that the nurse could have done to be helpful? • What else would you like to tell us about your surgery and the time after that we have forgotten to ask you? 	<ul style="list-style-type: none"> • How long did your loved one have to wait for surgery once s/he completed preparations? • What was it like for your loved one to have the surgery and the recovery in the hospital afterward? • What was it like for you during the same time? • What preparations did you make for the time after surgery? • What was it like to go home after the surgery? • Describe how your loved one is doing now. • Tell me about a time when a nurse was especially helpful to you or your loved one during or after surgery. • Can you think of something that the nurse could have done to be helpful? • What else would you like to tell us about surgery and the time after that we have forgotten to ask you?

Qualitative

There were 152 nodes isolated from patients' transcripts and 107 nodes identified from loved ones' transcripts. The nodes were then collapsed into 8 parent nodes: living with the illness, learning about LVRS, waiting for LVRS, most helpful thing preparing for LVRS, goals after LVRS, what LVRS recovery was like, how I am feeling now after LVRS, and what I would tell another patient. Table 3 lists these results and examples from the data that support the nodes.

Limitations

Mixed-methods research with small sample sizes, although illuminative, is not able to be generalized. Further, qualitative research, which is a large portion of this study, is context-specific, and therefore also not generalizable. However, the results provide an understanding of the phenomenon of interest and may be transferable to similar situations in which health-care encounters require rigorous and

extended contact with the health-care team. Two additional limitations of this study are the small sample size and the potential for bias within the results. However, this was balanced by performing triangulation of data among LVRS-expert clinicians, administrators, and researchers who were not familiar with the LVRS program and having interviews conducted by a nurse who did not participate in clinical care. Further research is needed to have a better understanding of the role of sustaining hope in the presence of serious illnesses when treatments are enhanced with family involvement.

Discussion

Quantitative results from the SF-36 indicate that overall, patients perceived the challenges related to daily activities improved after surgery, thus demonstrating increase in their quality of life. This occurred despite the fact that lung function tests showed little measureable improvement. Although

Table 2. Paired *t* test Compare SF-36 Means Among Pre- and Postsurgery Participants' Responses.

SF-36 Survey Question (Pre and Post LVRS)	Mean	Standard Deviation	<i>t</i>	<i>df</i>	Sig (2-tailed)
1. General Health	-1.000	1.225	-2.449	8	.040 ^a
2. Health now vs 1 year ago	.222	.667	1.000	8	.347
3. Participate in daily vigorous activities	-1.444	.527	-8.222	8	.000 ^a
4. Participate in daily moderate activities	-2.111	.928	-6.825	8	.000 ^a
5. Lifting or caring groceries	-1.778	.667	-8.000	8	.000 ^a
6. Climbing several flights of stairs	-1.778	.441	-12.095	8	.000 ^a
7. Climbing one flight of stairs	-2.222	.667	-10.000	8	.000 ^a
8. Bending, kneeling, or stooping	-2.000	.707	-8.485	8	.000 ^a
9. Walking more than one mile	-2.125	.835	-7.202	7	.000 ^a
10. Walking several hundred yards	-2.222	.833	-8.000	8	.000 ^a
11. Walking one hundred yards	-2.111	.601	-10.539	8	.000 ^a
12. Bathing or dressing yourself	-1.667	1.000	-5.000	8	.001 ^a
13. Cutting down time spent on work due to physical health	-1.111	.601	-5.547	8	.001 ^a
14. Accomplished less because of physical health	-.889	.601	-4.438	8	.002 ^a
15. Limited in work because of physical health	-.667	.500	-4.000	8	.004 ^a
16. Difficulty performing work because of physical health	-.778	.667	-3.500	8	.008 ^a
17. Cutting down time spent on work due to emotional health	-1.667	.500	-10.000	8	.000 ^a
18. Accomplished less than you like due to emotional health	-1.556	.527	-8.854	8	.000 ^a
19. Did work/ activities less carefully due to emotional health	-1.556	.527	-8.854	8	.000 ^a
20. Physical/emotional problems interfere with visiting	.889	1.269	2.101	8	.069
21. Bodily pain	2.222	.833	8.000	8	.000 ^a
22. Pain interfere with normal work	1.778	1.641	3.249	8	.012 ^a
23. Feel full of life	.778	1.093	2.135	8	.065
24. Feel nervous	-4.556	1.333	-10.250	8	.000 ^a
25. Felt down	-5.556	.882	-18.898	8	.000 ^a
26. Felt calm, peaceful	.778	1.302	1.793	8	.111
27. Energy level	-1.111	1.453	-2.294	8	.051
28. Felt downhearted and depressed	-5.000	1.000	-15.000	8	.000 ^a
29. Feel worn out	-3.000	1.500	-6.000	8	.000 ^a
30. Feel happy	.000	1.000	.000	8	1.000
31. Feel tired	-2.889	1.364	-6.353	8	.000 ^a
32. Physical/emotional problems interfere with social life	-4.111	.928	-13.291	8	.000 ^a
33. Seem to get sick easily	-1.444	1.333	-3.250	8	.012 ^a
34. Seem healthy as anybody else	.222	1.563	.426	8	.681
35. Expect health to get worse	-1.889	1.616	-3.507	8	.008 ^a
36. Health is excellent	.444	1.130	1.180	8	.272

Abbreviations: LVRS, lung volume reduction surgery; SF-36, short form 36.

^aSignificance $P < .05$.

patients verbalized how PR helped them build stamina (a patient commented, "Boy does that [rehab] help!"), no significant functional improvement was noted with the 6-minute walk test that is a hallmark of successful PR. It is important to note that the patients completed a PR program preoperatively and again postoperatively.

Qualitative results demonstrated a dramatic difference between the descriptions of the pre- and postoperative states, for both the patient and the loved one. It was interesting that the presurgery interviews lasted an average of 10 minutes longer than the postsurgery interviews. In the preinterviews, patients and loved ones were eager to share their fears in addition to hope for functional improvements. One patient shared, "I woke up one morning and I told my wife, look, we have to do something, I can't continue to just fight getting out of bed, . . . we have to see somebody that can maybe help us out a little bit." One patient's loved one shared "You just

get scared because you know . . . it is a major happening." Of note, patients sounded breathless on the phone during the interview, taking longer to communicate thoughts because of the focus on breathing. In the postinterviews, it seemed that the patients were eager to move on to their next daily activity and did not want to carry on an in-depth research conversation. One patient shared "In another hour and ½ I got another tee time." A loved one commented, "We are taking our dog for a walk, which she couldn't do before." Also apparent in patient participants' tones of voice was an upbeat sense of happiness and excitement compared to the presurgery interview tones, which were more subdued. For example, one patient before surgery commented, "My movement say, going from the bedroom to the kitchen to the bathroom I mean, it is just a struggle" and a patient after surgery commented "Oh its great! It's just an amazing difference! I have a new lease on life!" Following surgery, loved one

Table 3. Qualitative Nodes.

Nodes	Patient Statement	Loved One Statement
Living with illness	The way I'm confined. It's like you're confined? (Realization) Well you are confined, because you can't do like you used to do. I can't dance. I use to dance for my lovely wife of 52 years. It would take me 45 minutes just to wash up in the morning and brush my teeth, take my medicines. And I mean, it was a struggle to do that. It was a long period of time. I was exhausted by the time I just finished a simple little task.	I see his quality of life going down and I know he doesn't want that so I don't want that for him either if he can have better. It's hard because, you know, he can't, he doesn't have any quality of life. You know, if he stops people are always asking if he is okay, sir are you okay, when he stops to lean trying to catch his breath. You know, it is just very trying.
Learning about LVRS	I woke up one morning and I told my wife, I said "look, we have to do something" I said "I can't continue to just fight getting out of bed." I don't think it is to widely known to people that it is even available because I found out that it has been going on for years. And, I didn't know anything about it until my doctors mentioned it to me one day.	She at first didn't know if she wanted to do it but we checked into it and she decided she did want to try it. He said a few times before he finally decided he was going to do it, "I don't know if I am going to do this or not" . . . And, I said "Don't ask me that question. I can tell you how I feel about it. But don't ask me if you should or shouldn't. That is something you have to decide on your own."
Waiting for LVRS	What does it feel like? I don't know it's kind of looking at the light at the end of tunnel. You see it down there and you finally get there. I have been waiting on it for 10 weeks. And, now it is tomorrow. Oh. I'm waiting. I can't wait to be there. If it was today, I'd go today. I want to find out.	You know . . . just trying to stay positive that things will be fine. You just get scared because you know . . . it is a major happening. You do have those thoughts . . . well, okay is this really going to be worth it, you know what I mean. Just that kind of thing.
Most helpful thing in preparing for LVRS	(Nurse Navigator) was particularly helpful because she lays out every step of the road for you. I've talked to several people that have been through it. I started going to physical rehab which is a great thing and doing very exercises but the treadmill I started out doing 5 and 10 minutes and I am up to 30 minutes at 1.8 which isn't very fast but with a person with emphysema that is pretty good speed. I want to say maybe the first 3 times I went to pulmonary rehab, she took me in a wheelchair just to get to pulmonary rehab. And after about 2 weeks, I could go from the front of the hospital, to the elevators, up to the third floor to pulmonary rehab and just did my thing up there. So for me, that was an improvement.	We asked (Nurse Navigator) a question and she definitely knows what she is doing . . . she definitely knows what is going on. It was amazing how everybody just kind of put your mind at ease. I think that the fact that they administer to the entire family is a plus. We loved the team meeting we had with the (Nurse Navigator) and her group. We felt like everybody was on the same page. They all knew what everybody else was doing. And, I thought that was a wonderful system that they had at the hospital.
Goals after LVRS	I hope it's a big improvement Dancing is a thing that I hoping to redo. Well either you go on life being restricted or you can hope that something will come along that will lift some of those restrictions.	It just sounds wonderful. We were extremely optimistic and hope, hopeful. As far as that operation . . . I just believe you know, that that's, it's going to be alright. So it was like, well thank goodness we have something to look forward to that would help (patient) out to where he could get back to where you know, he wants to get back out. He wants to play golf. He wants to just do the things that he could do say, a year ago or now, 2 years ago.
What it is like to have LVRS	It was difficult but it could have be worse. I was there 17 days. My right lung and problem . . . that was my total time in the hospital. Adding up without that problem I would have been sent home in a short time.	Well we were kind of nervous. Said a little prayer that he would be all right. You know I had read that a certain percentage of people did not make it through . . . you know . . . that. I knew if he made it through he was going to be better because of what we were told you know . . . so . . . but I was worried about that you know.
How I am feeling after LVRS	So happy and how alive I feel to be able to breathe without the oxygen and carry on my life the way I want. Feel like I have a second chance with the surgery.	Oh, it's great. It's just an amazing difference. Yes, and she seemed to recover much faster than I thought she would. As I said her breathing was just 100% better. Her color, her everything.

(continued)

Table 3. (continued)

Nodes	Patient Statement	Loved One Statement
What I would tell another patient	<p>The only thing is to say it is worth it.</p> <p>Well anyone I see that is on oxygen that has COPD I tell them to get their butt over and talk to (hospital), because it was wonderful for me.</p> <p>Any little bit of improvement is going to be better than what they got.</p>	<p>Our club had our Christmas dance in December and we were able to get up and dance which is the first time we done that for . . .</p> <p>She taking our dog for a walk which she couldn't do before, she is going to the stores and doing shopping which she couldn't do before, she is doing a lot better.</p>

Abbreviations: COPD, chronic obstructive pulmonary disease; LVRS, lung volume reduction surgery

participants' tones of voice expressed relief and joy compared to the presurgery interview tones of worry and concern. A loved one stated before surgery "I think I see him slipping. It's hard because, you know, he can't, he doesn't have any quality of life" and after surgery a loved one stated, "A lot better, you know, we could probably do anything we want now! It's amazing!"

It also became clear through the data analysis that the emerging overarching theme was *Hope*. *Hope* was identified 85 times in the transcripts. Examples of patient comments include, "I just hope, you know, that it helps enough," "I just hope everything goes okay." Loved ones stated "I just hope the best for him," "We are extremely optimistic and hope, hopeful," and "They told us that he may not be able to get rid of the oxygen, I am hoping that he can." Hope is often experienced when death is imminent, yet encourages and supports positive thinking (24). Many patient participants shared that they knew death was imminent, stating they felt surgery was their only option to prevent further decline; and yet, many hoped for, and talked about becoming better following surgery. One patient stated, "Well, I am going to die if I don't get it done. I mean I am just wasting away here (laugh) . . . maybe this is going to be a big help."

Hope assists patients emotionally endure crisis. Curtis et al (25) demonstrated that hope helps patients tolerate discomfort better. This would support the findings that the patient participants did not mention or share feelings of pain in their stories or complications that had occurred during LVRS hospitalization in the postsurgery interview at 6 months. It seemed that pain and complications were accepted by the patients and loved ones. Patients stated, "it was difficult, but it could have been worse" and "It wasn't fun . . . but I am better and I am going to live awhile."

Hope was also present in the loved ones' stories. Hope can help caregivers overcome loss, grief, and lack of control (26,27). In this study, loved ones expressed the grief of seeing the patient decline and become unable to engage in treasured activities as breathing worsened. Many of the loved ones expressed hope for the future but were unable

to anticipate the outcome of this complex surgery; nevertheless, they described hope for a positive outcome. Loved ones stated, "He wants to get back out; I hope we made the right choice" and "I hope it's a big improvement."

Even though the pulmonary function test and the 6-minute walk results did not show significant functional improvement after LVRS, most patient participants' perceptions of quality of life did improve. One patient commented, "I am so happy and how alive I feel to be able to breathe without the oxygen and carry on my life the way I want." Interestingly, SF-36 questions regarding happiness and peacefulness did not show any significant difference before and after surgery. This may be a reflection of a type II statistical error related to small $n = 11$. However, happiness and peacefulness may be reflected in the overall theme of *Hope* experienced by the participants and their loved ones.

The use of mixed-methods in this study to gather both qualitative and quantitative data about experiencing LVRS was beneficial. The lack of a correlation between physiologic-measurement improvements and quality-of-life improvements in this study and previous research (7) is a phenomenon requiring more research. Being able to understand the psychological impact of pulmonary conditioning, support, and education gained through the completion of PR and other self-care milestones required to be eligible for the surgery may help to identify further nursing implications to assist these patients and their loved ones through this rigorous surgical process. Although these results cannot be generalized, the findings can be used by nurses to assist patients and loved ones as they navigate other multistaged care processes such as transplants, cancer regimens, and bariatric surgery programs.

Implications

The goal of this research was to obtain an understanding of the lived experience of the patient and their loved one undergoing LVRS and to identify any nursing interventions that

could assist and support them through the process. Nursing implications identified included:

Increase Awareness of LVRS

Many patients stated that they were not aware of LVRS as a surgical option and wish that they would have known sooner. Others appreciated talking to past patients who underwent LVRS while making the decision whether to pursue the surgery option.

Interprofessional Teamwork

Many of the participants commented on the teamwork displayed by the LVRS team. They appreciated group appointments, consistency in the message, and the interprofessional rounds during hospitalization. All of these approaches helped very ill patients manage both time and limited energy throughout the process. Many lessons can be learned from this interprofessional teamwork for all patient types.

Nurse Navigator Role

A nurse coordinator was a key member of the LVRS team, assisting patients throughout the process. Participants voiced their gratitude; many stated it was nice to have a single “go to” person who knew about each aspect of the LVRS program. Nurse navigator roles may be framed with different titles, but serve the purpose for patients and families, no matter the diagnosis, as that single point of contact; the person they can take all questions and concerns to and who will coordinate and advocate on their behalf.

Pulmonary Rehabilitation

Engaging in PR was overwhelmingly thought of as the most beneficial element in preparing for, and recovering from LVRS. Patient participants voiced their amazement on how the program assisted them to develop stamina and improve oxygenation before surgery even occurred.

Loved One Support

A major realization that occurred when analyzing data for nursing interventions was the crucial role the loved one plays in the LVRS process. The loved one is usually the person attending the presurgery appointments with the patient, staying during the hospitalization, and encouraging the patient in their recovery. The presence of a loved one is vital for every part of the process. Many patient participants voiced dependency on their loved one, voicing appreciation for the inclusion of their loved one in the visits and interprofessional rounds during hospitalization.

Conclusion

There is intense preparation and lengthy recovery encompassing the experience of LVRS. To endure this endeavor, families and patients often voice *Hope* as their strength to persevere. The multiple patient visits that are part of the LVRS process provide the opportunities for health-care professionals to foster hope by facilitating beneficial interventions supporting the success of the self-care management required before, during, and after the procedure. More research is needed to determine the beneficial nursing interventions that are most helpful to support the success of self-care management for these patients and their loved ones.

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Declaration of Conflicting Interests

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