Short Communication

Interventional Cardiology

Implementing simulation-based learning in the training of LVAD competent nurses in the emergency department

Abstract

Heart failure is a progressive disease that affects about 6.7 million people in the United States of America, and it is projected to increase by 46%, affecting more than 8 million people by the year 2030. Many of these patients require heart transplantation to improve their quality of life, but due to the limited number of organs available, many die waiting for one. A Left Ventricular Assist Device (LVAD) provides an option to heart failure patients as either a bridge to transplantation, a bridge to recovery, or as destination therapy. LVAD patients are becoming more prevalent with improved survival rates, increasing from 80.5% 1-year survival rates from 2010-2014 to 82.5% from 2015-2019. Emergency Department (ED) nurses must have a basic understanding and the appropriate skills to provide high-quality care and implement life-saving interventions.

Keywords: Heart failure • Left ventricular assist device • Heart transplantation

Description

Houston, Texas, is the home of many groundbreaking LVAD programs, including but not limited to CHI Baylor St. Luke's Medical Center, Houston Methodist, Memorial Hermann, Harris Health Ben Taub Hospital, and the Veterans Affairs Hospital. However, caring for LVAD patients may be intimidating for healthcare workers with limited exposure to this high-risk patient population. Current practice in hospitals like CHI Baylor St. Luke's Medical Center requires ED nurses to obtain eight hours of LVAD education via videos and undergo an annual validation of skills such as controller exchange and changing batteries. They must be able to perform assessments, recognize and troubleshoot alarms, accompany patients during transfers, and perform any needed intervention. However, ED nurses rely on the circulatory support technician, a certified specialist, who ensures the device is working correctly and assists with troubleshooting as needed throughout the hospital. Relying on the technician to perform these skills can impact the Length of Stay (LOS) and care depending on their availability, as there may only be one or two technicians during the shift in the entire hospital. A revised competency program was implemented at CHI Baylor St. Luke's ED aiming to elevate the skills and confidence of ED nurses caring for LVAD patients by increasing competency training to four times a year and adding a simulated emergency scenario, thus reducing overreliance on the circulatory support technician, which can positively impact the LOS and decrease delays in care. Limited research has been done evaluating the competency program in the ED [1]. However, literature shows that repeated simulated scenarios can improve skills competency in LVAD patients and critical care nurses caring for LVAD patients [2,3]. It is imperative to

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implement evidence-based practice into the training of competent LVAD nurses to ensure high-quality care is provided.

Simulation-Based Learning (SBL) is used in various disciplines to train novices and experienced learners to develop and retain complex skills; it has been used in engineering, aviation, and the military [4]. SBL is an innovative learning strategy that has been heavily studied and incorporated into nursing school curricula and clinical settings. SBL provides a realistic setting that enhances clinical skills, problem-solving, and interdisciplinary teamwork and is superior when incorporated into a multimodal learning approach [5]. Through SBL, nurses, among other healthcare workers, have the opportunity to immerse themselves in realistic situations designed in structured learning experiences without endangering themselves or the patients [6,7].

Conclusion

Low-frequency, high-risk patient populations require specialized quality care from competent and confident nurses. In the ED, nurses must be able to perform basic skills, identify alarms, and intervene appropriately, especially in emergent situations when circulatory support technicians are not readily available. Implementing the Quality Improvement (QI) project, Improving LVAD Competency in Emergency Department Nurses Using Quarterly Skills Check and Simulation, helped the organization see that additional support is needed to improve the confidence of LVAD-validated nurses in the emergency department. However, quarterly assessments of LVAD skills and knowledge checks may not be feasible to replicate when the availability of the equipment is uncertain. Moving forward, scheduling an education session every six months may be easier to plan with the circulatory support technician, LVAD coordinator, or the director of the institution's LVAD program. Training and assigning two to three ED nurses who can serve as LVAD champions and including a readily available resource book in the competency program, is recommended to further elevate the nurses' skills and knowledge outside of the education sessions. Despite the vast limitations presented, this project identified a need to provide additional support to ED nurses to elevate their skills and increase their confidence in caring for LVAD patients. Prior limited research identified SBL as a strategy to ensure competency in complex skills, develop problem-solving skills, and enhance interdisciplinary teamwork in a safe and structured learning environment. Future research and replication of the QI project are needed to assess further the efficacy of more frequent SBL and the implementation of readily available resource books and LVAD nurse champions.

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