

Nurses' knowledge of heart failure self-management

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Abstract:

Heart failure (HF) is increasing in prevalence. Patient education is essential and is included in both ambulatory and hospital performance measures used to ensure quality care. Nurses are often the primary providers of education to patients with HF. This study assessed nurses' knowledge of basic principles of HF self-management. The study surveyed 49 nurses who regularly provided care to patients with HF at a hospital in the southeastern United States. A 20-item, true/false survey was administered to participants. Mean HF self-management knowledge score was 15.97 (79.85% correct). Consistent with previous studies, nurses scored lowest on knowledge related to transient dizziness (16.3% answered correctly), daily weight monitoring (36.2% answered correctly), and asymptomatic hypotension (58.3% answered correctly). Findings confirm previous work suggesting that nurses may not be adequately prepared to educate patients with HF about self-management.

Keywords: heart failure | patient education | HF self-management | nurse learning needs

Article:

Heart failure (HF) is a chronic condition that is increasing in prevalence. At age 40, the lifetime risk of developing HF is 1 in 5.¹ In 2005, it was estimated that 5 million Americans had HF, and more than 550,000 new cases are diagnosed yearly.² By 2030, the prevalence is expected to nearly double.³ The number of new cases annually continues to rise, primarily due to aging of the population and decreased mortality from other cardiovascular conditions.⁴

HF has a poor prognosis and is associated with poor quality of life (QOL), with frequent hospitalizations and other related medical costs.⁵ Among patients older than 65 years, the median survival rate after the onset of HF is 1.7 years for men and 3.2 years for women.⁶ The estimated direct and indirect costs of HF in 2006 amounted to nearly \$29.6 billion, largely due to hospitalizations.¹ In fact, decompensated HF is the leading cause of hospitalization among

Medicare patients in the United States, accounting for more than 800,000 hospitalizations a year.⁴ It is estimated that as many as two-thirds of hospitalizations are preventable.⁷ The most common causes of preventable HF decompensation are failure of patients to adhere to prescribed medication regimens and failure of patients to seek early treatment for symptoms of worsening HF.⁷

Patient education reduces the probability of nonadherence and aids in early detection of changes in body weight or clinical status.² Education on diet, activity, and medications allows for earlier intervention and can potentially prevent deterioration, rehospitalization, and worsening QOL.

National consensus guidelines from the American College of Cardiology/ American Heart Association (ACC/ AHA) and the Heart Failure Society of America (HFSA) for the management of chronic HF mandate that all patients with HF receive individualized counseling focused on self-care, using a team approach.^{7,8} Consequently, interdisciplinary interventions reduce both hospital admission rates and mortality.⁹ Adjunctive education, such as written materials and videotapes, may also be helpful but should not replace one-on-one education provided by members of the interdisciplinary team.¹⁰

Further, HFSA guidelines specify that most of the information provided to patients should come from nurses with expertise in HF.⁸ Ultimately, if nurses are to implement patient education programs, they must understand the principles of HF management. Only 2 published studies have assessed nurses' knowledge of self-management of HF.

Studies by Albert and colleagues¹¹ and Washburn and colleagues¹² examined the learning needs of nurses caring for patients with HF. Both studies used an identical 20-item true/false questionnaire to survey nurses from a variety of settings in the Midwest, including university and community hospitals, patients' homes, and hospice. The questionnaire measured knowledge of basic principles of HF self-management including diet, fluid management, signs and symptoms of worsening condition, medications, and exercise. The mean of the nurses' knowledge scores out of a possible 20 were 15.2 ± 2 (76% correct)¹¹ and 14.6 ± 2 (73% correct).¹² Nurse participants in both studies scored lowest (<40%) on 3 questions related to daily weight monitoring, asymptomatic hypotension, and transient dizziness on arising. The findings suggest that nurses may need further education in HF management principles to properly educate patients.

The current study assessed nurses' knowledge of basic principles of HF self-management, using the same tool but controlling survey distribution and survey site conditions. The study also assessed whether nurses' knowledge of HF self-management principles was associated with the work setting (the telemetry unit or the coronary care unit) and years of work experience.

METHODS

A descriptive correlational design was used. The convenience sample included 49 nurses who worked in the telemetry unit or the coronary care unit in a 688-bed, level I medical center in the southeastern United States. Participants were required to provide regular care to HF patients. Nurses were notified of the study in monthly staff meetings and through informational fliers

posted throughout their work areas. After receiving approval from the local institutional review board, participants were recruited and informed consent was obtained.

A 20-item true/false written survey on HF management principles, designed by Albert and colleagues,¹¹ was administered to nurses on both units over a 4-week period in the fall of 2005. Written permission to use the survey was obtained before the study. The survey measured nurses' knowledge of basic principles of management of HF commonly included as part of HF education, including diet (3 questions), fluid volume status (7 questions), signs or symptoms of decompensation (6 questions), medications (2 questions), and exercise (2 questions).

Validity and reliability of the survey has been previously established. Albert and colleagues¹¹ tested the tool for face and content validity using HF experts and educational experts. The tool was then piloted for test-retest reliability using HF experts and registered nurses (RNs) from 9 hospitals who collaborated on the project, all of whom had a 100% test-retest score within a 2-week period of time. Cronbach a reliability testing was not performed since there was no single theme, nor was there rewording of questions regarding similar topics (eg, diet, fluid monitoring); thus, each question was considered unique. Further testing of reliability using other means, however, was done in the study by Washburn and colleagues¹² using the tool, which found similar results.

For this study, predictive variables, including education level, years of experience, work environment, and work status (part-time vs full-time) were also included in the survey. Nurses answered each question by marking either a "yes" (true) or "no" (false) box. Participants could also check a box requesting further information about the question topic. A researcher was present during survey distribution and completion to decrease the likelihood of participant collaboration and/or utilization of published references. Survey administration took approximately 10 minutes per participant.

RESULTS

Of the 78 nurses on the telemetry and cardiac care units asked to participate, 49 agreed to complete the survey. Sixteen participants worked in the cardiac care unit and 32 in telemetry. One participant did not specify work location. Of the 49 nurses, 32 (11 cardiac care unit nurses and 21 telemetry nurses) answered all 20 questions, 16 did not fully complete the survey, leaving 1 to 6 unanswered questions, and 1 respondent gave multiple answers to 1 question. Nurses averaged 15.65 years of experience, with a range from 2 months to 26 years. Fifteen participants had <2 years of experience, 32 had >2 years experience, and 2 participants did not specify years of experience. Highest nursing degrees included 1 nurse with a master of science in nursing, 32 nurses with a bachelor of science in nursing, and 16 nurses with an associate degree in nursing. All participants were RNs and 6 had critical care RN certification. Forty-four of the nurses worked full time (at least 36 hours per week) 4 worked part time, and 1 did not specify employment status.

Level of Knowledge of HF Nurses

The mean score for all study participants was 15.97 ± 1.94 (79.85% correct). The range of correct answers was 12 to 19 of 20 questions (60%–95%). The percentage of correct responses to individual questions ranged from 16.3% to 100%. Participants had scores >90% on 10 questions; this percentage is higher than in earlier studies. On 5 questions, individual scores ranged between 60% to 90%, and on 3 questions individual scores were <60% (Table I, Table II, Table III).

Table I. Correct Responses to Individual Questions With Scores >90%

Question	Score, %
Notify physician of new-onset or worsening fatigue. (Yes/True)	100.0
Notify physician of worsening leg weakness or decreased ability to exercise. (Yes/True)	100.0
As long as no salt is added to foods, there are no dietary restrictions for patients with heart failure. (False)	98.0
Once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights. (False)	98.0
If patients feel thirsty, it is ok to remove fluid limits and allow them to drink. (False)	97.9
Patients with heart failure should drink plenty of fluids each day. (False)	97.9
Swelling of the abdomen may indicate retention of excess fluid due to worsening heart failure. (True)	95.9
If patients take their medications as directed and follow the suggested lifestyle modifications, their heart failure condition will not return. (False)	95.7
If the patient gains more than 3 lb in 48 hours without other heart failure symptoms, they should not be concerned. (False)	91.8
Coughing and nausea/poor appetite are common symptoms of advanced heart failure. (False)	91.3

Table II. Correct Responses to Questions With Scores >60% and <90% and Request for More Information

Question	Score, %	Need More Information, No. (%) of Times Requested
Notify physician of weight gain of 3 lb in 5 days without symptoms. (Yes/True)	83.7	0 (0)
If a patient wakes up at night with difficulty breathing, and the breathing difficulty is relieved by getting out of bed and moving around, this does not mean that the heart failure condition has worsened. (False)	81.3	2 (4)
It is ok to use potassium-based salt substitutes (like No Salt® or Salt Sense®) to season food. (False)	69.8	7 (14)
Lean deli meats are an acceptable food choice as part of the patient's diet. (False)	68.1	5 (10)
When patients have aches and pains, aspirin and nonsteroidal anti-inflammatory drugs (eg, ibuprofen) should be recommended. (False)	64.9	13 (27)

Table III. Correct Responses to Question With Scores <60% and Request for More Information

Question	Score, %	Need More Information, No. (%) of Times Requested
Notify physician if blood pressure recording is 80/56 mm Hg without heart failure symptoms. (No/False)	58.3	4 (8)
When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's ideal or "dry" weight. (False)	36.2	3 (6)
Notify physician of dizziness or lightheadedness when arising that disappears within 10 to 15 minutes. (No/False)	16.3	0 (0)

Performance Based on Employment Setting and Years of Experience

The mean score for cardiac care unit nurses was 16.31 ± 1.96 (81.55%) and for telemetry nurses was 15.47 ± 1.93 (77.35%; $P=.163$) (Figure 1). Nurses with >2 years of experience scored significantly higher than nurses with less experience (16.19 vs 14.93, respectively; $P=.031$) (Figure 2).

FIGURES 1 AND 2 ARE OMITTED FROM THIS FORMATTED DOCUMENT

Responses to Individual Questions.

Two questions had a 100% correct response rate and 8 questions had a >90% correct response rate. The 3 questions that <60% of patients answered correctly were on the topics of daily weight monitoring, asymptomatic hypotension, and transient dizziness on arising (36.2% correct, 58.3% correct, and 16.3% correct, respectively). Although nurses were given the option to request more information regarding survey questions, few nurses requested more information on these 3 low-scoring questions.

DISCUSSION

Participants' mean score on HF self-management knowledge was similar to scores found in previous studies by Albert and colleagues¹¹ and Washburn and colleagues¹² (15.97 [80%] vs 15.2 [76%] and 14.6 [73%], respectively). Participants in this study may have had slightly better scores for 3 reasons; the setting was an academic hospital, participants were exclusively RNs who regularly provided care to patients with HF, and the work environment involved cardiac units. Similarly, Albert and associates found that nurses' working in HF units or clinic settings and those from academic hospitals scored better than other nurses.

Nevertheless, with overall scores just below 80%, these nurses were inadequately prepared to educate patients with HF regarding self-management principles after discharge. It is important to critically examine the gaps of knowledge, particularly in the areas of asymptomatic hypotension, transient dizziness, and weight monitoring.

Asymptomatic Hypotension

The question pertaining to asymptomatic hypotension was stated as follows: “Notify the physician if BP recording is 80/56 mm Hg without HF symptoms,” which was scored correctly as “false.” The mean score on the question was 58.3%. A possible reason for the low scores on this question is that the nurses surveyed in this study were required to withhold many HF medications based on a certain parameter set by the physician, usually SBP <80 to 85 mm Hg or a heart rate <60 beats per minute, with no mention of symptoms. Hypotension is often the reason nurses in an inpatient setting withhold β -blocker therapy despite evidence of its efficacy in HF.¹³ The ACC/AHA advocates that an acceptable therapeutic systolic blood pressure (SBP) for patients with HF is near 80 mm Hg as long as the patient is asymptomatic.¹⁰ Nurses may not be aware that asymptomatic hypotension associated with decompensated HF may be a different entity than the same phenomenon in a stable compensated situation.

In the absence of hypoperfusion (altered cognition, lightheadedness, dizziness or sleepiness, oliguria, tachycardia, and cold, clammy skin), HF medications should not be withheld solely based on an SBP level of 80 mm Hg. Furthermore, nurses may be translating usual hospital practice as dictated by health care prescribers in acute care settings into education materials provided to compensated HF patients. Patients may be instructed or misled at discharge to withhold HF medications for hypotension regardless of symptoms. This may not be problematic for patients with coronary artery disease or hypertension; however, patients with HF should avoid temporary discontinuation of therapy unless adverse effects occur.

Three β -blockers have been shown to reduce the risk of death in HF patients: bisoprolol, sustained-release metoprolol, and carvedilol.¹⁴ A retrospective analysis of the Carvedilol Prospective Randomized Cumulative Survival (COPERNICUS) trial¹⁴ found that New York Heart Association class IV patients with a low pretreatment SBP level of 85 to 95 mm Hg benefited greatly from β -blocker therapy. β -Blockers need to be taken on a daily basis to achieve maximum benefit. Nurses should instruct patients with HF to take their medications daily despite low BP unless accompanied by symptoms of hypoperfusion. There is no specific cutoff for asymptomatic hypotension that might be transient, especially if it occurs when multiple classes of drugs reach peak effect at the same time. Lack of clear evidence regarding management of transient asymptomatic hypotension may have resulted in the poor scores of the nurses surveyed. Until more data are available, nurses and patients should discuss appropriate parameters for withholding specific medications with the HF care provider.

Transient Dizziness

The question pertaining to transient dizziness was stated as follows: “Notify the physician of dizziness or lightheadedness when arising that disappears within 10 to 15 minutes,” which was scored correctly as “false.” In this study, the mean score on the question about transient dizziness was alarmingly low (16.3% correct). Transient lightheadedness or dizziness is frequently associated with chronic use of HF medications, in particular vasodilators and β -blockers.¹⁰ One possible reason for the low score is that nurses may have been uncomfortable with the time frame specified for transient dizziness (10–15 minutes). No HF studies focused on an acceptable length of time for patients to experience transient lightheadedness or dizziness without initiating

an intervention. While nurses may realize that transient dizziness can be expected in an ambulatory setting, the length of the event may have seemed problematic.

Nurses should teach patients with HF that transient dizziness on arising may occur and is acceptable provided it is not prolonged or accompanied by other symptoms such as palpitations, dyspnea, chest pain, or syncope. Nurses can teach patients to pump each foot (like pushing on a pedal in a car) 10 times before arising and to rise more slowly to prevent or minimize occurrences. Establishment of a “cutoff” time parameter for transient dizziness in patients with HF, however, needs further research.

Daily Weight Monitoring

The question pertaining to weight monitoring was stated as follows: “When assessing weight results, today’s weight should be compared with the patient’s weight from yesterday, not the ideal or ‘dry’ weight,” which was scored correctly as “false.” Assessing daily weights is another area of concern; only 36.2% of nurses answered this question correctly. One plausible reason for the low scores may be that the sample surveyed worked exclusively in an inpatient tertiary care setting. Hospital-based nurses may focus on daily or overall weight loss as a means of monitoring the progress of hospitalized patients with HF who are typically admitted in a decompensated, “congested” state. Rather than considering ideal or “dry” weight as the comparative measure, hospital nurses are accustomed to focusing on the acute scenario. Ideal or dry weight, however, reflects a euvolemic state (absence of edema, rales, extra or worsening heart sounds, and elevated jugular venous pressure) and should be the comparative unit of measure. In patients hospitalized with a new diagnosis of HF, baseline (or dry) weight has yet to be established; thus, collaboration with the HF management team is essential. In addition, patients may be able to articulate a time when they felt good at a specific weight.

Patients with HF should inform their provider if they gain 3 lb overnight or >5 lb in 1 week over their dry weight, since this could be a sign of worsening HF.⁸ Educational packages provided to patients at discharge clearly state the importance of comparing daily weights, but written information does not discuss comparing daily weights with dry weight. Patient education needs to be clear about this essential component of self-management so that patients know when to notify their provider of weight gain.

Although patients with HF are told to weigh themselves daily, a recent study by van der Wal and associates¹⁵ found that <35% of patients weighed themselves >3 times per week. Reasons for not weighing themselves included not knowing they should weigh themselves (14%), lack of motivation (6%), and forgetting (5%). The study also found that knowledge about weighing daily led to greater compliance with monitoring daily weights.¹⁵ Clearly, nurses must provide adequate education at discharge with reinforcement at subsequent outpatient follow-up visits.

Nurses’ Education in HF

For many diseases and conditions such as HF, formal nursing education may not adequately prepare nurses to educate patients. Hospital orientation for nurses often entails unit-specific training aimed at enabling nurses to provide quality clinical care to patients. Patient population

education for hospital-employed nurses is often provided through continuing education courses and unit-specific training.

The sample in this study was one of convenience and was limited to nurses working on 2 units that frequently treated patients with HF; however, the nurse participants routinely worked with patients with HF. Data on nurse knowledge reflects a need for more education in HF self-management principles to ensure that patients receive adequate education regarding caring for themselves at home, particularly with respect to asymptomatic hypotension, transient dizziness, and daily weights.

Research to determine specific parameters that patients and nurses should use in deciding to withhold medications for transient and/or prolonged asymptomatic hypotension would be valuable. It would also be useful to have research on a “safe” time frame in which patients may experience transient dizziness on arising that does not require action.

Development of innovative educational programs for nurses at all levels would be beneficial. These programs should emphasize performance measures as identified by the ACC/AHA.¹⁶

It would also be useful to investigate knowledge of other health care professionals regarding principles of self-management of HF, since a multidisciplinary team often manages HF. Investigation of patient knowledge pre- and post-educational intervention with age-appropriate and culturally sensitive tools would give researchers insight into patient learning needs and the effectiveness of interventions. Future studies could also investigate the impact that various discharge educational strategies have on hospital readmission rates for HF patients.

CONCLUSIONS

With the increasing prevalence of HF, patients need to be provided with high-quality, accurate information on self-management skills and parameters for self-monitoring. As primary educators of patients with HF, nurses need to be knowledgeable about all HF principles of self-management to provide accurate patient education. Evidence-based curricula for HF nurses at all levels of practice need to be developed to ensure the prevention of unnecessary hospitalizations and complications for patients living with HF.

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