CE 2.0 CONTACT HOURS

Screen and intervene: Depression's effect on CHF readmission

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Individuals with congestive heart failure (CHF) have a high incidence of depression among patients with chronic diseases. The New York Heart Association (NYHA) functional class is closely related to co-morbid depression.[1] Depression often leads to deterioration in physical well-being, resulting in an increased usage of healthcare resources.[2]

Fortunately, the identification and treatment of depression can reduce the risk of consequences associated with diagnosis, including decreased quality of life, loss of relationships, loss of self, reduction in satisfaction of life, and reduction in physical activity.[3] For this reason, researchers conducted a study using depression screenings at a moderately sized tertiary medical center in the Rockford, Ill., metropolitan area to determine the influence of depression on hospital readmission rates in patients with CHF. The study resulted in recommendations for how nurse managers should educate their staff members on the proper administration of depression screenings and for policy makers on the amount of patient access to depression screenings.

Adding up

CHF incidence is expected to grow exponentially in the United States over the next few decades. Some contributing factors to this expected growth include the aging population, increased life expectancy, and unhealthy lifestyle choices resulting in poor cardiovascular health.[4] It's projected that the cost associated with treatment of CHF complications will grow 215% by 2030.[4] Also, many CHF complications result in an increase in hospital admission and consecutive readmissions. These complications are also increased if the patient experiences depression, a startling revelation when the high rate of depression in patients with CHF is compared with the rate among patients with other chronic diseases.[5]

Research suggests that depressed patients are less likely to adhere to prescribed medications, lifestyle recommendations, and follow-up compared with nondepressed patients.

Background

Patients with CHF must adopt a series of lifestyle changes to reduce the risk of mortality. These include dietary changes, an exercise program, substance abuse cessation, and medication management. Making these changes is difficult for patients, and success is determined by the patient's willingness to change. Research suggests that depressed patients are significantly less likely to adhere to prescribed medications, lifestyle recommendations, and follow-up compared with nondepressed patients.[6]

Depression in patients with CHF remains underdiagnosed for several reasons. It's difficult to find time to screen these patients properly before discharge because of the patient's decreased length of stay. Additionally, the experience level of staff plays a role in actually identifying patient depression. If there's a lack of continuity between RN shifts, ineffective care planning may surface. Symptoms may be perceived as normal under such circumstances, and patients are reluctant to inform their healthcare provider of depressed feelings due to the negative stigma.[7]

Previous research supports the use of a depression screening tool administered by RNs on hospital admission as an accurate method of screening.[7] The Patient Health Questionnaire (PHQ)-2 and PHQ-9 are effective predictors of depression in patients with CHF.[8] (See *Figure 1*.) The American Heart Association (AHA) recommends screening for depression in cardiac patients using a two-step process at multiple intervals as best practice.[9]

Research purpose

Improving clinical outcomes and reducing morbidity in patients with CHF is a two-step process: screen and intervene. By practicing the screening process, this study aimed to identify the following:

- Determine if a relationship existed among CHF patients between a positive depression screening on the PHQ-9 and an increased readmission rate to an acute care facility.
- Were CHF patients with a positive depression screening more likely to be readmitted to the hospital within 30 days than patients without a positive depression screening?
- Did the readmission rate increase when extended to 60 days?
- At which level of depression (mild, moderate, or severe, per PHQ-9 categories) did a correlation for readmission exist, if any?

Literature review

CHF is often a final phase of cardiovascular diseases resulting from a variety of cardiovascular anomalies. According to the AHA, between 5 and 6 million North Americans have a CHF diagnosis.[10] CHF is one of the most common causes of chronic disability, reduction in tolerance for physical activity, and impaired quality of life in older individuals.[11]

A 2006 meta-analysis of 27 studies found a 21% incidence of clinically significant depression in patients with heart failure.[5] Researchers found that depression rates depend heavily on the rigor of screening criteria for classifying participants as depressed; rates were as high as 38% with the use of liberal criteria and as low as 14% with strict criteria.

The NYHA functional status scale correlates strongly with depression prevalence, which increases steadily from 11% in patients with NYHA class I (mild) heart failure to 20% in those with class II, 38% in those with class III, and 42% in those with class IV (severe) heart failure.[5] The likelihood of depression increases as patients approach the end of life.

Depressive symptoms can initiate a spiraling decline in physical and psychological well-being and affect the course of cardiovascular disease.[3] Not only clinical depression, but also subclinical symptoms of depression can elevate an individual's risk of future cardiac events and readmission to the acute care facility. Depressed patients are less likely to adhere to prescribed medications, lifestyle recommendations, and follow-up cardiac testing when compared with nondepressed patients.[6]

Research supports the use of the PHQ-9 depression screening tool in acute care facilities completed exclusively by RNs, specifically in patients with acute coronary syndrome. Its efficacy is as accurate in identifying depression as when a provider administers it.[7]

Figure 1: Sample PHQ-9 form

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "√" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

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Methodology

To identify if a relationship existed, researchers conducted a retrospective chart review using a descriptive, correlational, quantitative research design methodology. The independent variable was the PHQ-9 depression score. The dependent variable was readmission to the acute care facility within 30 and 60 days. This retrospective study tested the hypothesis that depression scores were related to readmission rates utilizing one-way Analysis of Variance, or ANOVA, methodology to test for differences between groups.

Sample

The population for this study was men and women age 18 or older who were admitted to the hospital with a primary or secondary diagnosis of CHF, and who were screened for depression during hospitalization using the PHQ-9 tool. Patients who died during the course of the study were excluded.

The correlation between depression level and readmission status was statistically significant.

Researchers used a systematic sampling of those admitted with CHF from April through July. August and September were used to test for readmission rates at 30 and 60 days for patients admitted into the study in July. Researchers also evaluated a registry list of all patients meeting inclusion criteria. Variables extracted from the medical record included patient's medical record number, age, sex, marital status, patient admission class, days until the next admission, and patient depression score.

Depression scoring

When more than one PHQ-9 score was present for subsequent hospital admissions, researchers used the score identified during the initial admission. Data sets included only the first readmission. Although subsequent readmissions were assessed, they weren't used, because days to readmission are calculated off the first admission only. For the purpose of this study, a patient was considered to meet the readmission classification once he or she was admitted as an inpatient the second time to the hospital. Researchers uploaded data into predictive analytics software, and variables included PHQ-9 score and demographics, such as age, sex, and marital status. Patients were classified as not readmitted to the hospital, readmitted within 30 days, or readmitted within 60 days.

Demographics

Over 4 months, 1,081 patients with a history of CHF were admitted. Of those patients, 29.26% (n = 316) met all inclusion criteria. Of these 316 patients, 152 patients were male (48.1%) and 164 patients were female (51.9%). Self-reported marital status showed 137 patients were married (43.6%), 87 patients were widowed (27.5%), 47 were divorced (15%), and 43 were single (13.6%). The mean age was 71.92 (SD = 13.99). The women (mean age 74.25, SD = 13.59) were a little older than the men (mean age 69.40, SD = 14.03).

Results

Using the scoring guide for the PHQ-9, of the 316 patients included in the study: 262 (82.9%) had a score of 0-4 (minimal depression), 51 (16.1%) had a score of 5-14 (mild/moderate depression), and 3 (0.9%) had a score of 15-27 (severe depression).

The total number of patients readmitted as inpatients was 51 (16.1%). Looking at only the first readmission, of the 51 readmitted patients, 40 (78.43%) were readmitted within the first 30 days and 11 (21.57%) were readmitted between 30 and 60 days post discharge. (See *Table 1*.)

Research question 1: *Determine if a significant correlation existed among CHF patients between a positive depression screening on the PHQ-9 and an increased readmission rate to an acute care facility.* The correlation between depression level (mild, moderate, or severe) and readmission status (no readmission, 30-day, or 60-day) was statistically significant (Spearman correlation = 0.549, $p < 0.001$) with the more depressed patients more likely to be readmitted.

Research question 2: *Were CHF patients with a positive depression screening more likely to be readmitted to the hospital within 30 days than patients without a positive depression screening?* Similarly, the chi-square likelihood ratio was statistically significant ($X^2 = 82.315$, $p < 0.001$),

Table 1: PHQ-9 depression category by first readmission status

	First readmission (n = 316)		
PHQ-9 level of depression	Not readmitted	30-day readmissions	60-day readmissions
Minimal depression (PHQ-9: 0-4)	244 (93.1)	12 (4.6)	6 (2.3)
Mild/moderate depression (PHQ-9: 5-14)	21 (41.2)	25 (49.0)	5 (9.8)
Severe depression (PHQ-9: 15-27)	0 (0.0)	3 (100.0)	0 (0.0)
Total	265 (83.9)	40 (12.7)	11 (3.5)

Note: "Not readmitted" includes patients who didn't come back to the hospital, as well as patients who presented only in the ED. 30-day and 60-day readmissions are calculated for only the first readmission. Percentages are calculated within depression categories. Spearman correlation = 0.549, $p < 0.001$.

indicating that a patient with a positive depression screening was more likely to be readmitted.

Research question 3: *Did the readmission rate increase when extended to 60 days?* As *Table 1* indicates, an additional 11 patients had a first readmission during days 31 to 60. This increased the overall percent readmitted by an additional 3.5%, for a total readmission percentage of 16.1% by 60 days post discharge.

Research question 4: *At which level of depression (mild, moderate, or severe, per PHQ-9 categories) did a correlation for readmission exist, if any?* One of the challenges of this study was the finding that 54.7% of patients (173/316) had a score of "0" for their PHQ-9 during their original admission for heart failure. It's unclear whether these zeroes reflect no symptoms of depression or whether the scale wasn't administered. Patient records with the PHQ-9 score missing were eliminated from the study. However, since the possible range of scores for the PHQ-9 is 0-20, zeroes are possible and must be retained for the analysis. Because of this issue, a definitive answer for research question 4 couldn't be determined. However, it should be noted as the depression scores went from the category of mild to moderate to severe, there was a progressive increase in the percent of patients readmitted.

Discussion

Many patients weren't admitted to the hospital but were still seeking care in the ED within 30 days of discharge from the acute care facility. This increased the number of resources needed to care for these patients. Further analysis is needed to determine if a difference exists between mean score depression screening in patients readmitted to the hospital, not readmitted, and admitted to the ED using the PHQ-9.[12]

Limitations

Limitations of this study related to the high percent of patients with a depression screening score of 0: 173 out of 316 (55%). Further, the PHQ-9 tool identified that a PHQ-9 score of 0-4 is considered minimal or no depression.[12] The overall number of participants who had a depression score of 0-4 was 262 out of 316 (83%). This was inconsistent with current research that suggests as many as 60% of patients with CHF experience depression and 21% have clinically significant depression.[5]

These data suggest that the screening completed by RNs at the time of admission was actually ineffective. An understanding of why is unknown at this time. Possible reasons include lack of understanding of the importance of depression screening, nurses answered questions based on what they observed and scored accordingly, patients were less willing to answer accurately when the tool was administered verbally, or the body language or tone of RNs administering the tool influenced the patients' responses.

Additionally, many charts were excluded from the study because of the lack of completion of the depression screening tool upon hospital admission. This also suggested a lack of understanding of the importance of the tool by nursing or an

unwillingness of nurses to complete the tool accurately.

Recommendations

Patients should be screened for depression at key points in their care, including admission to an acute care facility. Although the question of what point of hospitalization is the most beneficial and accurate time to screen for depression remains unanswered, it's understood that screening is a critical step of care planning while in the hospital.

Developing a process to manage patients who scored positively on the depression screening tool is necessary to improve patient outcomes and reduce readmission. This process should include care of the patient across the continuum. Patients should have resources available to better manage depression at any point in their care.

A communication vector between points of care is also crucial. If a patient is identified as having a positive depression screening score while in the acute care facility, then interventions need to start before patient discharge. Severe depression must be handled emergently. A mental health provider must be consulted to evaluate patient risk of harm and implement appropriate safety measures.

Include the primary care provider in the care plan. The primary care provider should validate preliminary findings of depression upon follow-up to the clinic after discharge. Subsequent follow-up screening should occur at intervals, annually, or if the patient demonstrates symptoms. Inform the primary care provider of what interventions were recommended to the patient during hospitalization.

It's appropriate for nurses to complete the depression screening, but they must be adequately educated on how to complete it effectively. After screening is completed, nurses must have the support and resources to facilitate the intervention process based on patient need and should start immediately while the patient is hospitalized.

Education

Possible recommendations for education include the importance of screening and its benefit to the patient, the perception of the behaviors of a patient with depression, and the correct way to administer the tool without bias.

Nursing education is a vital part of the depression screening process. It's important to determine how nurses perceive screening for depression. Once nurses' perceptions of depressed patients are understood, nurse managers should develop an educational plan based on gaps in nursing perceptions.

Patients require education on the importance of why the screening should be completed and why it's important to answer the questions honestly. Also educate patients on how this can improve their quality of life. Patients may withhold answers because of fear that they may be judged, or other similar reasons. Depression often has a negative connotation and may have other sensitivities based on the patient's culture. These patients may be less likely to express their true feelings.

Policy

Recommendations for policy include establishing resources and interventions before discharge. Policy should require that patients with positive depression screens not be discharged until resources are established. Apply a list of required resources to corresponding depression scores of mild, moderate, and severe.

Patients should have an established contact person in the outpatient setting before discharge. In addition to their primary care provider, patients also need to have a social worker contact established in the outpatient setting. Hospital policy should require outpatient social worker contact, including the scheduling of a first follow-up appointment post discharge.

Screening for depression often requires the use of numerous resources, which taxes the healthcare institution. Policies should reflect the reimbursement for screening and follow-up care. Include depression on the patient's problem list as a billable diagnosis.

Research

This research study has brought some insight to the role of depression and readmission rates in patients with CHF. Although this information is valuable, additional research is recommended to further understand the research phenomenon. Subsequent efforts should include repeating the study after comprehensive depression screening education to determine if there's a significant difference in pre- and posteducation data and depression scores. Additionally, further research is suggested to evaluate what interventions are effective in managing depression when a patient tests positive for depression at the mild/moderate PHQ-9 score (5-14) and the severe PHQ-9 score (>14).

Summary

This research study provided data suggesting a relationship between depression and readmission rates that may allow us to allocate the appropriate resources to help these patients cope effectively. This effective coping may result in decreased morbidity, prolonged length of life, improved quality of life, and healthcare cost reduction.

The effective usage of depression screening may be expanded to other disease processes to help our community, as a whole. Information gathered from these data can also support the development of a depression care team for those who screen positive for depression. NM

REFERENCES

1. Lossnitzer N, Wild B, Schultz J, et al. Potentially modifiable correlates of functional status in patients with chronic heart failure. *Int J Behav Med.* 2014;21(6):956–960.
2. Naderi S, Barnett B, Hoffman RS, et al. Factors associated with failure to follow-up at a medical clinic after an ED visit. *Am J Emerg Med*. 2012;30(2):347-351.
3. Izawa K, Watanabe S, Oka K, et al. Association between mental health and physical activity in patients with chronic heart failure. *Disabil Rehabil.* 2014;36(3):250–254.
4. Heidenreich PA, Trogdon JG, Khavjou OA, et al. Forecasting the future of cardiovascular disease in the United States: a policy statement from the American Heart Association. *Circulation*. 2011;123(8):933-944.
5. Rutledge T, Reis VA, Linke SE, Greenberg BH, Mills PJ. Depression in heart failure: a meta-analytic review of prevalence, intervention effects, and associations with clinical outcomes. *J Am Coll Cardiol*. 2006;48(8):1527-1537.
6. Trudel-Fitzgerald T, Tworoger SS, Poole EM, Williams DR, Kubzansky LD. Prospective changes in healthy lifestyle among midlife women: when psychological symptoms get in the way. *Am J Prev Med.* 2016;51(3):327-335.
7. McGuire AW, Eastwood JA, Macabasco-O'Connell A, Hays RD, Doering LV. Depression screening: utility of the patient health questionnaire in patients with acute coronary syndrome. *Am J Crit Care*. 2013;22(1):12-21.
8. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001; 16(9):606-613.
9. American Heart Association. Heart failure patients with depression have four times risk of death. http://newsroom.heart.org/news/heart-failure-patients-with-depression-have-four-times-risk-of-death.
10. American Heart Association. Classes of heart failure. www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/Classes-of-Failure_UCM_306328_Article.jsp.
11. Roger VL, Go AS, Lloyd-Jones DM, et al. Heart disease and stroke statistics—2012 update: a report from the American Heart Association. *Circulation*. 2012;125(1): e2-e220.
12. Pfizer. Patient health questionnaire. 1999.

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The authors have disclosed no financial relationships related to this article.

DOI-10.1097/01.NUMA.0000508257.88733.0c