Indo - American Journal of Life Sciences and Biotechnology

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Impact of Pharmacy Student and Resident-Led Discharge Counselingon Heart Failure Patients

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Abstract

The goal of many healthcare systems' efforts is to prevent readmissions for heart failure. Pharmacists have the knowledge and experience to properly instruct patients on the proper use of medications. However, there has been a dearth of research on how patients with heart failure exacerbations fare after receiving discharge education from pharmacy students and residents. The purpose of this research was to examine the effectiveness of a discharge counseling program for patients with heart failure taught by pharmacy students and residents. The rate of readmission within 30 days due to heart failure was the major outcome measure. Self-reported patient comprehension of drugs, the number of recorded prescription mistakes, and the projected cost avoidance were secondary end objectives. Conclusions: A total of 86 patients were included in the intervention group and 94 patients were enrolled in the control group. There was no discernible change in readmission rates between the experimental and control groups. One medication mistake or discrepancy was recorded for every 2.5 individuals counseled, for a total of 34 cases. This resulted in an estimated savings of $4,241 for the institution. Ninety percent of patients who got discharge counseling with a pharmacy resident or student felt they had a better grasp of their drugs. No significant change in readmission rates was seen, however some medication mistakes were avoided and a high proportion of patients reported feeling more comfortable with their drug regimens.

Keywords

heart failure, 30-day readmissions, discharge, education, pharmacy

Introduction

High mortality, lengthy hospital stays, and difficult treatment regimes are all features of heart failure, a chronic illness.10% to 19% at 2 weeks and as high as 50% over 3 months are the readmission rates for heart failure.4 Medicare loses around $17.4 billion each year as a result of these avoidable readmissions. If a patient is readmitted within 30 days after discharge, the Centers for Medicare and Medicaid Services (CMS) may withhold a part of reimbursement under the Patient Protection and Affordable Care Act (PPACA).5 Therefore, it is imperative that all hospitals work to reduce their 30-day readmission rates.

Patient understanding typically requires extensive educational efforts.

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Methods

Setting and Participants

This retrospective, nonrandomized intervention study was con‑ducted in the heart failure ward at Baystate Medical Center (BMC), a 659-bed standing of the medications and the impact medication adher-ence has on readmissions.[6,7] Pharmacists have the training and expertise needed to provide medication-related education and to resolve medication-related problems at discharge, which may reduce preventable adverse events, hospital readmissions, and visits to the emergency department (ED).[8-10] Ideally, phar-macists would provide medication counseling to heart failure patients in all the hospitals. However, due to high patient–phar-macist ratios, this is not always possible. Pharmacy residents .who were let go between October 1st, 2011 and March 31st, 2012 after receiving an ICD-9-CM diagnosis and treatment for symptoms associated to heart failure. Participants were not included if they could not independently take their prescribed medications. The institutional review board at BMC gave its permission to this research.

Intervention

Two groups of four, two APPE students and two PGY-1 pharmacy practice residents, offered the counseling. Throughout the school year, the same group of four APPE students offered discharge counseling. Each student participated in counseling for one academic year, while each pharmacy resident participated in counseling for three consecutive months. Pharmacy students and residents received comprehensive training from a heart and vascular clinical pharmacy specialist or the previous PGY-1 resident before beginning the program. Pathophysiology and pharmacotherapeutic management of heart failure were covered in detail. Medications widely used to address heart failure were evaluated, including their methods of action, adverse effects, monitoring criteria, and drug interactions. An

tertiary care academic teaching hospital. The study population included patients at least 18 years of age almost two-hour long PowerPoint presentation was used to impart this knowledge.

The students then had real-world experience with counseling via role play. The pharmacy resident and the pharmacist co-investigators assessed the pupils. Students commenced patient education under the supervision of the PGY-1 resident or a pharmacist coinvestigator after investigators determined they had a firm grasp on the aforementioned material. About four sessions of one-on-one guidance counseling were provided to each pharmacy student. Once the researchers determined that the students had reached a sufficient degree of knowledge, they were given permission to advise independently.

The counseling procedure for students and residents was made easier with the help of many instruments. The first instrument is a patient evalua‑ tion sheet designed to help in the assessment of the patient's medication. This instrument was used to analyze and evaluate the patient's medical history, laboratory values, current medicines, and the compatibility of drugs with their indications (e.g., angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers for patients with a left ventricular ejection fraction of less than 40%). Medication information sheets were created for patients using data from Micromedex CareNotes. Each prescription or class of pharmaceuticals had its own patient handout, and they were written to be as simple and easy to understand as possible for middle school and high school students. Medication indication, instructions for use, storage, cautions, and adverse effects were all included in the patient education handouts. In addition, a medication regimen tailored to each individual patient's needs was created. In addition to the indication and quick instructions, this medication schedule

medicine, dosage, and dosing schedules for patients before they are released.

A registered nurse specializing in heart failure would notify a pharmacy intern or resident each day about patients who were being discharged. After assessing the patient's current pharmacotherapy using the assessment instrument, they would provide advice, educational materials, and a customized drug plan prior to discharging the patient. The indication, administration, missed doses, storage, warnings/precautions, and side effects were all included in the counseling. Lifestyle factors including watching one's weight, cutting down on salt, getting more exercise, drinking less alcohol, and quitting smoking were also covered. There was no official evaluation of the patient's educational background before therapy began. At the conclusion of the counseling session, the "teach-back approach" was utilized to gauge the patient's comprehension of the material covered.

Study Design

At first, a pharmacy resident or student counseled just one heart failure patient each day through the discharge process. Patients with more complex medication regimens (i.e., multiple medications at discharge or multiple medication changes) or multiple admissions would be prioritized for counseling by the pharmacy resident or student if there were multiple patients with heart failure being discharged at once. Since not every patient could be advised by a pharmacy resident or student, it was decided that these people would benefit most from this kind of guidance. With the help of nurses and care managers, discharge times were arranged so that loved ones could also participate in the educational process.

The nurse gave each patient the same predetermined instructions before they were released. The patient was taught how to recognize the early warning signs of heart failure, what foods to avoid, what exercises to do, and what medications to take once they were home. Discharge counseling was supplemented for the intervention group by a resident or student. Patients who were released over the same time period but who were not able to get counseling from a pharmacy student or resident served as the control group. A validated technique was used to pair patients in the control group with patients in the intervention group based on their likelihood of heart failure readmission. Despite the lack of randomization, this method guaranteed that patients in the control group were representative of those in the intervention group. The heart failure coordinator called all of the patients who were released from the heart failure ward that week to check up with them. Discharge questions were answered, and topics covered included medication education and patient satisfaction.

Measurements

Heart failure readmission within 30 days of release as the major or discharge ICD-9 diagnosis of chronic heart failure was considered the primary outcome. Patients' stated level of medication comprehension was a secondary objective, along with the amount of medication mistakes recorded by medical professionals in training and the money saved as a result. Medication comprehension was measured

Table 1. Baseline Characteristics.

Characteristic	Intervention (n ¼ 86) Mean + SD or % (n)	Control (n ¼ 94) Mean + SD or % (n)	P value
Age, years	70 + 14.8	72 + 14.2	.28
Male	44.2% (38)	52.1% (49)	.30
LVEF,%	40 + 20.9	37 + 18.3	.30
Total # of meds	10.9 + 3.9	10.9 + 5.0	.92
Readmission risk score, %	25.3 + 4.6	24.3 + 4.8	.18
In-hosp cardiac arrest	1.2% (1)	1.1% (1)	1.00
DM	59.3% (51)	47.9% (45)	.14
CAD	55.8% (48)	57.5% (54)	.88
Prior PCI	29.1% (25)	52.1% (49)	.002
Aortic stenosis	9.3% (8)	8.5% (8)	1.00
Stroke	11.6% (10)	8.5% (8)	.62
COPD	22.1% (19)	21.3% (20)	1.00
Dementia	3.5% (3)	5.3% (5)	.72

Abbreviations: CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; In-hosp, in-hospital; LVEF, left-ventricular ejection fraction; PCI, percutaneous coronary intervention; SD, standard deviation.

Table 2. Predictors of Heart Failure Readmission.

Characteristic	Readmitted (n ¼ 17) Mean + SD or % (n)	Not readmitted (n ¼ 163) Mean + SD or % (n)	P value
Age, y	73 + 11.5	71 + 14.8	.49
Male gender, %	17.6% (3)	51.5% (84)	.01
LVEF, %	44 + 17.9	38 + 19.7	.16
Total # of meds	12.7 + 4.2	10.7 + 4.5	.08
Readmission risk score, %	26.6 + 5.5	24.6 + 4.6	.09
In-hosp cardiac arrest	5.9% (1)	0.6% (1)	.18
DM	47.1% (8)	54.0% (88)	.62
CAD	52.9% (9)	57.1% (93)	.80
Prior PCI	47.1% (8)	40.5% (66)	.61
Aortic stenosis	5.9% (1)	9.2% (15)	1.00
Stroke	0.0% (0)	11.0% (18)	.23
COPD	41.2%(7)	19.6% (32)	.06
Dementia	0.0% (0)	4.9% (8)	1.00
Counseled	52.9% (9)	47.2% (77)	.80

within three to five days after release, at the follow-up interview. Patients were questioned whether or not "overall," they felt their conversations with pharmacists or pharmacy students improved their grasp of their prescription drugs. Disagree, neutral, and agree responses were noted. Students and residents reported medication mistakes. The Thomson Reuters Action O-I Comparative Database was used to calculate the amount of money saved as a result of interventions.The Center for Outcomes Research and Evaluation (CORE) 30-day readmission risk score was also gathered, along with the usual suspects (11), such as demographic information, prior medical history, heart failure features, laboratory data, vitals, admission and discharge medicines, and so on. Patient characteristics such as age, sex, in-hospital cardiac arrest, a history of diabetes, heart failure, coronary artery disease, prior percutaneous coronary intervention, aortic stenosis, stroke, COPD, dementia, and systolic blood pressure, heart rate, respiratory rate, sodium, blood urea nitrogen, creatinine, hematocrit, glucose, and left-ventricular ejection fraction are used in the readmission risk score calculator. Visit http://www.readmissionscore.org/heart_failure.php to see the previously verified readmis- sion risk score..Twelve All information was gathered from electronic health records.

Independent-sample t tests (Gaussian) or chi-square tests (categorical) were used for bivariate analysis. In order to quantify the difference in the percentage of readmissions and to establish 95% confidence intervals while controlling for any imbalances in baseline variables, we employed multivariable Poisson regression with robust standard errors. Purpose of the Research

Heart disease, stroke, and diabetes are all conditions that may be treated well in the hospital. Standard deviation, mean, left ventricular ejection fraction, and percutaneous coronary intervention.

In order to have 82% power to detect a difference of 12 percentage points in the main end point, we need to recruit 100 patients into each group. Two-tailed P values.Significant levels of 0.05 were found.

Results

There were a total of 94 participants in the control group and 86 in the intervention group. Eighty-six of the 86 patients who received counseling did so from a student group. Patients were seen and worked up by the pharmacy residents and students in an average of 52 minutes. Table 1 displays the demographic and clinical features shared by the intervention and control groups. The average age was 71, and men made up 48.2% of the sample size. The average percentage of patients at risk for readmission was 24.8% across all study groups.

Table 2 displays the correlations between patient characteristics and hospital readmission for heart failure. The rate of heart failure readmission was substantially higher for women than for men. Heart failure readmission was also linked with COPD, drug burden, and readmission risk score, although these associations were not statistically significant (Table 2).

Consistent with BMC's heart failure readmis- sion rate, around 9.4% (95% CI 5.1%, 13.8%) of the patients were readmitted within 30 days. In an unadjusted analysis, Table 3 shows, there was no discernible difference between the experimental and control groups. When controlling for other factors, there was also no discernible difference.

Forty-six of the patients who were counseled were contacted for the follow-up survey. Forty-one people were polled, and 89.1% (95% CI: 76.4%- 96.4%) of those people said they now understood their

run (albeit 30-day readmission is the standard).

Discussion

It is projected that $4241 was saved because to the heart failure discharge counseling program run by pharmacy students and residents. Students reported 26 interventions for a total of 69 patients they counseled, with 38% of those patients receiving at least one clinical intervention due to the students' efforts. Patients in the program said they felt more informed about their medications after meeting with a pharmacy intern or student.

Our counseling intervention did not result in a lower risk of heart failure readmissions after 30 days, despite the fact that other studies have established the usefulness and effectiveness of such measures (see references 13–21). It is worth noting that 90-day readmissions were used as a marker in a number of the previous interventions13,15,19; as a result, our intervention may have resulted in similar reductions in the long

For this difference, the research only had 8% power, based on a 2-tailed significance level of.05.

It's likely that more counseled patients survived long enough to be readmitted following the initial hospitalization because the intervention provided a survival benefit. If this were to happen, the benefits of counseling in reducing readmissions may be nullified by a survival bias. It is also likely that patients' awareness of adverse drug effects and/or symptoms of heart failure aggravation (such as sudden weight gain) was raised as a result of the counseling. Death outcomes and admission complaints should be included in future research to uncover any biases, which might otherwise counterbalance the intervention group's 30-day heart failure readmission rate decreases. In conclusion, our research may have been limited in

its ability to accomplish and/or identify gains since 30-day heart failure readmis- sion rates had been continuously dropping at our institution for many years prior to the study's initiation. Our research has significant implications for the continued integration of pharmacy residents and, more importantly, students into clinical practice, even though the intervention did not seem to influence 30-day read-mission rates. We met the goals and objectives of the American Society of Health- System Pharmacists (ASHP) Pharmacy Practice Model Initia- tive by successfully integrating pharmacy students and residents into a heart failure discharge program and building working relationships with the other healthcare professionals.22 By employing students and residents, we were able to boost patients' knowledge of their drugs, decrease the number of medication mistakes, and save a considerable amount of money without having to cut the number of pharmacists on duty.

References

1. SF Jencks, MV Williams, and EA Coleman. 1. Medicare fee-for-service patients' readmission rates. N Journal of the American Medical Association (Engl J Med) 360(14):1418-1428, 2009.

2. To cite this entry: Lindenfeld J, Albert NM, Boehmer JP, et al. 2010 HFSA Comprehensive Heart Failure Practice Guideline Executive Summary. There were 16 pages of J Card Fail in 2010.

3. American Heart Association Statistics Committee and Stroke Statistics Subcommittee; Roger VL, Go AS, Lloyd-Jones DM, et al. The American Heart Association has released its latest data on heart disease and stroke rates. Reference: Circulation, 123(4, 2011):e18-e209.

4. Cost-effectiveness of a heart failure transitional care program: a systematic review and meta-analysis. 2011;171(14):1238-1243 in Arch Intern Med.

5. Five Stone J, and G. Hoffman. Congressional Research Service. "Medicare Hospital Readmissions: Issues, Policy Options, and PPACA." 2010.

6. References: 6. Lowe CJ, Raynor DK, Purvis J, et al. The results of a medication review and teaching program targeted at the elderly population in primary care settings. Journal of Clinical Pharmacology. 2000;50(2):172-175.

7. ...and others7 Schnipper JL, Kirwin JL, Cotugno MC, et al. Preventing post-hospitalization medication reactions via pharmacist counseling. Journal of the American Medical Association.

8. 8. Dudas, V., T. Bookwalter, K.M. Kerr, and S.Z. Pantilat. The significance of phone calls made to hospitalized patients following their release. A systematic review of the literature.

9. Impact of a pharmacist-facilitated hospital discharge program. 9. Walker P, Bernstein S, Jones J, et al. 169(21):2003-2010 Arch Intern Med.

10. Macdonald, E., Macdonald, J.B., and M. Phoenix. Enhancing post-hospitalization medication adherence. Reference: Br Med J. 1977;2(6087):621-621.

11.

12. 11) Truven Health Analytics. Accessible at https://actionoi.truvenhealth.com/, the Thomson Reuters Action O-I Comparative Database spans the years 2005–2010.

13. Keenan, Patrick; Normand, Stephen; Lin, Zhong; et al. Using 30-day all-cause readmission rates of heart failure patients, this administrative claims metric may profile hospital performance. 2008;1(1):29-37. Circulation.

14. Thirteen authors; Rich M, Beckham V, Wittenberg C, etc. Congestive heart failure in the elderly: a comprehensive effort to reduce readmissions. In 1995, the New England

Journal of Medicine reported that 333(18):1190-1195.

15. The authors (#14) McAlister FA, Lawson FM, Teo KK, et al. Disease management regimens for heart failure: a meta-analysis of randomized controlled trials. American Journal of Medicine. 2001;110(5):378-384.

16. Randomized RCT of an education and support intervention to reduce readmis- sion of patients with heart failure. Krumholz HM, Amatruda J, Smith GL, et al. Citation: J Am Coll Cardiol. 2002;39(1):83-89.

17. The efficacy of disease management programmes in preventing hospital readmission in older patients with heart failure: a systematic review and meta-analysis of published findings. Gonseth J, Guallar-Castillon P, Banegas JR, Rodriguez-Artalejo F. Publication information: Eur Heart J. 2004;25(18):1570-1595.

18. To cite this chapter: Gwadry-Sridhar F, Flintoft V, Lee D, et al. Analyzing the correlation between hospital readmissions and deaths in patients with heart failure: a meta-analysis. 164(21):2315-2320 (2004). Arch Intern Med.

19. ....and others (Kern DE, Wright SM, Phillips CO, and others). Planning for older patients with congestive heart failure at discharge and beyond: a systematic review and meta-analysis. JAMA. 2004;291(11): 1358-1367.

20. Tobias Koelling, Michael Johnson, Robert Cody, et al. Patients with chronic heart failure who get education before discharge had better clinical outcomes. 2005;111(2):179-185. Circulation.

21. Twenty. Jovicic, A., J.M. Holroyd, and S.E. Straus. A meta-analysis of randomized controlled trials examining the impact of self-management interventions on the health of individuals with heart failure. 2006;6:43 BMC Cardiovascular Disorders.

22. Ditewig JB, H. Blok, J. Havers, and others. Patients with chronic heart failure: a comprehensive assessment of the effects of self-management therapies on mortality, hospital readmissions, the rate of chronic heart failure hospitalization, and quality of life. 2010;78(3):297-315 in Patient Educ Couns.

23. Pharmacy practice paradigm for university medical facilities. Bush P, Ashby D, Guaharoy R, et al. 2010;67(21):1856-1861 American Journal of Health-System Pharmacy.