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# The Relationship of Cardiovascular Disease to 30-Day Hospital Readmission Among Older Adults with Type 2 Diabetes Mellitus

Meet Shah

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# The Relationship of Cardiovascular Disease to 30-Day Hospital Readmission Among Older Adults with Type 2 Diabetes

Meet Shah, OMS-II; Shmilah Choudhary, OMS-II; Sanath Shetty, OMS-II; Terrie Ginsberg, DO; Matthew H. McLaughlin, BS  
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## ABSTRACT

**Introduction:** Reducing thirty-day hospital readmissions is a top healthcare priority. However, there is little research describing the risk factors of readmission among patients with diabetes, especially for older adults. Understanding what the risk factors are for 30-day hospital readmission for older adults with type 2 diabetes (T2DM) would help identify patients at risk of rehospitalization.

**Objective:** The aim of this study was to identify factors associated with 30-day unplanned hospital readmissions among older adults with T2DM. Factors to be investigated are: patient demographics and whether the patient was hospitalized for cardiovascular disease.

**Methods:** Participants were older adults  $\geq 65$  years old with T2DM, admitted to a community hospital from January 2012-January 2017. Of 843 patients, 200 were randomly selected to have their electronic medical records reviewed for this study.

**Results:** Patients readmitted within 30 days of discharge were similar to patients who were not readmitted on most demographic characteristics, except for hospitalization in the 12 months before admission. Readmitted patients were more likely to have been hospitalized for cardiovascular disease than not readmitted patients.

**Conclusion:** Older adults with T2DM who were readmitted within 30 days post-discharge were more likely to have had a previous hospitalization and more likely to have been hospitalized for cardiovascular disease. Future analyses will incorporate additional potential predictors of unplanned hospital readmissions.

## INTRODUCTION

- Reducing 30-day hospital readmissions is a top healthcare priority. However, despite the interest in reducing early readmissions, there is relatively little research focusing on readmissions among patients with type 2 diabetes (T2DM).<sup>1</sup>
- In particular, there are very few studies that investigate factors that are predictive of hospital readmission among older adults with T2DM.<sup>2,3</sup>
- Given that the prevalence of diabetes in the United States is highest among older adults (21.3%)<sup>4</sup> and the substantial costs associated with unplanned hospital readmissions,<sup>5</sup> it is important to identify risk factors of readmission in this population.
- An understanding of the risk factors of hospital readmission among older adults with T2DM would aid healthcare providers in identifying which patients are at highest risk of readmission. This information could potentially be used to inform interventions designed to prevent rehospitalization.

## SPECIFIC AIM

- The aim of this study was to conduct retrospective reviews of electronic medical records to identify factors associated with unplanned 30-day hospital readmissions among older adults with T2DM. Factors investigated were: patient demographics and whether patients were hospitalized for cardiovascular disease.

## METHODS

### PARTICIPANTS

- Inclusion Criteria:** Participants were older adults  $\geq 65$  years old admitted to a community hospital from January 1, 2012 to January 1, 2017 with a diagnosis of T2DM at their index hospitalization, defined as patients' first hospitalization to occur during the study period.
- Exclusion Criteria:** Patients were excluded if they died during the index hospitalization or were discharged to hospice.

### PROCEDURES

- Of the 843 patients who met the study's inclusion criteria, 200 were randomly selected to have their electronic medical records reviewed.
- Factors investigated were: patients' demographics and whether patients were hospitalized for cardiovascular disease.

## RESULTS

- Readmission Rate:** Of the 200 patients, 15.5% (N=31) had an unplanned hospital readmission within 30 days of discharge.
- Data on demographic characteristics are presented in Table 1.

Table 1. Demographic characteristics

Characteristic	Readmitted		Not Readmitted		p-value
	N	(%)	N	(%)	
Race (N=184)	(N=30)		(N=154)		0.49
	African American	9 (30.0)	33 (21.4)		
	White	20 (66.7)	110 (71.4)		
	Other	1 (3.3)	11 (7.2)		
Sex (N=200)	(N=31)		(N=169)		1.00
	Female	17 (54.8)	94 (55.6)		
	Male	14 (45.2)	75 (44.4)		
Hospitalization 12 months prior (N=200)	(N=31)		(N=169)		0.00
	Yes	19 (61.3)	37 (21.9)		
	No	12 (38.7)	132 (78.1)		
Age (N=200)	N	M (SD)	N	M (SD)	p-value
	31	78.58 (7.71)	169	77.75 (8.36)	0.61
Body Mass Index (N=198)	31	28.69 (6.33)	167	29.50 (6.79)	0.54
Length of stay (N=200)	31	6.35 (4.24)	169	6.38 (5.45)	0.98

- In general, there were no statistically significant differences between patients who were readmitted and patients who were not readmitted on demographic characteristics.
- However, a statistically significant difference was found on whether patients were hospitalized in the 12 months prior to admission. Patients who were readmitted were more likely to have been previously hospitalized than patients who had not been readmitted.

- Data on whether patients were hospitalized for cardiovascular disease are presented in Table 2.
- Patients were categorized as having been hospitalized for cardiovascular disease if their reason for hospitalization was one of the following diagnoses: heart failure, ischemic stroke, or myocardial infarction.

Table 2. Cardiovascular disease as reason for index hospitalization

		Readmitted		Not Readmitted		p-value
		N	(%)	N	(%)	
Hospitalized for cardiovascular disease (N=199)	Yes	8	(25.8)	15	(8.9)	0.01
	No	23	(74.2)	153	(91.1)	

- There was a statistically significant difference between readmitted and not readmitted patients on whether they were hospitalized for cardiovascular disease, with readmitted patients being more likely to have been hospitalized for cardiovascular disease than not readmitted patients.

## CONCLUSIONS

- Readmitted and not readmitted patients with T2DM were similar on most demographic characteristics.
- Patients who had been readmitted within 30 days of discharged were more likely than patients who had not been readmitted to have had a previous hospitalization in the 12 months prior to admission.
- Readmitted patients were more likely than not readmitted patients to have been hospitalized for cardiovascular disease.
- Future analyses of these data will incorporate other potential predictors of hospital readmission in this population.

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