Access to Healthcare, Utilization, and Expenditures Among Adults With Diabetes and Cardiorenal Comorbidities

HSD54

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BACKGROUND

- Diabetes is a major chronic disease associated with substantial healthcare utilization and financial burden in the United States.
- The burden of diabetes is often greater when cardiorenal comorbidities are present, including renal disease, atherosclerotic cardiovascular disease (ASCVD), and heart failure (HF).
- These conditions are clinically interconnected and may require frequent healthcare visits, long-term medication use, specialist care, and ongoing disease monitoring.
- As a result, adults with diabetes and cardiorenal comorbidities may experience higher healthcare expenditures and greater challenges accessing affordable care.

OBJECTIVE

- This study aimed to evaluate healthcare access, cost-related barriers, healthcare utilization, and expenditures among U.S. adults with diabetes, with and without cardiorenal comorbidities.

METHODS

- Data were obtained from the 2018–2022 Medical Expenditure Panel Survey (MEPS) and included adults aged ≥18 years.
- MEPS sampling weights were applied to estimate the nationally representative distribution of adults with and without diabetes and cardiorenal events.
- Diabetes and cardiorenal events were identified using ICD-10 codes and self-reported conditions.
- Participants were grouped as No DM, DM without cardiorenal events, or DM with cardiorenal events, including renal disease, ASCVD, and HF.
- Access barriers included inability to afford medical care or prescription medicines, and delays in medical care or prescription medicines due to cost.
- Healthcare utilization outcomes included ER visits, outpatient visits, prescription medicines, hospital discharges, and nights in hospital.
- Healthcare expenditure outcomes included all health services total payments, prescription medicine total payments, all health services out-of-pocket costs, and prescription out-of-pocket costs.
- Group differences were assessed by comparing DM overall with No DM, and by comparing each cardiorenal event group (DM + renal, DM + ASCVD, and DM + HF) with DM without cardiorenal events. Access barriers were assessed using chi-square tests, while healthcare utilization and expenditure distributions were assessed using Wilcoxon rank-sum tests.
- Significance levels were defined as: $p < 0.05$; $p < 0.01$; $p < 0.001$.

RESULTS

- The weighted study population represented **226.6 million** adults without diabetes (n = 92,827) and **29.6 million** adults with diabetes (n = 14,895). Among adults with diabetes, **20.2 million** had no cardiorenal events (n = 9,896), **2.1 million** had renal disease (n = 1,135), **8.2 million** had ASCVD (n = 4,333), and **0.7 million** had HF (n = 384) (Table 1).
- Access barriers were higher among adults with diabetes compared with those without diabetes (Table 2).
- Among adults with diabetes, access barriers were higher among those with renal disease, ASCVD, or HF compared with those without cardiorenal events (Table 3).
- Adults with diabetes and cardiorenal events had higher healthcare utilization across ER visits, outpatient visits, prescription medicines, hospital discharges, and nights in hospital compared with those without cardiorenal events (Figure 1).
- Healthcare expenditures were also higher among adults with diabetes and cardiorenal events, including total health services payments, prescription medicine payments, out-of-pocket health services costs, and out-of-pocket prescription costs (Figure 3).
- All utilization and expenditure comparisons were statistically significant at $p < 0.001$ when comparing DM overall with No DM and when comparing each cardiorenal event group (DM + renal, DM + ASCVD, and DM + HF) with DM without cardiorenal events.

Table 1. Participant Characteristics by Diabetes Status and Cardiorenal Events

Characteristics	No DM n = 92,827	DM overall n = 14,895	DM no cardiorenal n = 9,896	DM + renal n = 1,135	DM + ASCVD n = 4,333	DM + HF n = 384
Age, mean	48.5	63	60.4	67.7	68.6	69
Female, n (%)	49,744 (53.6)	7,845 (52.7)	5,536 (55.9)	596 (52.5)	1,937 (44.7)	202 (52.6)
Hispanic, n (%)	19,349 (20.8)	3,181(21.4)	2,365 (23.9)	196 (17.3)	698 (16.1)	29 (7.6)
NH White, n (%)	53,238 (57.4)	7,505 (50.4)	4,776 (48.3)	583 (51.4)	2,393 (55.2)	231 (60.2)
NH Black, n (%)	12,496 (13.5)	2,955 (19.8)	1,872 (18.9)	272 (24.0)	917 (21.2)	106 (27.6)
NH Asian, n (%)	5,033 (5.4)	679 (4.6)	523 (5.3)	32 (2.8)	133 (3.1)	6 (1.6)
NH Other / Multiple, n (%)	2,711 (2.9)	575 (3.9)	360 (3.6)	52 (4.6)	192 (4.4)	12 (1.6)
Annual personal income, mean	$43,470	$32,351	$34,993	$25,522	$27,334	$24,460
Received food stamps, n (%)	10,691 (12.0)	2,853 (20.1)	1,753 (18.5)	266 (24.2)	949 (23.0)	103 (28.6)
Not employed, n (%)	41,578 (45.8)	10,075 (69.4)	6,059 (62.3)	977 (87.7)	3,479 (83.8)	323 (89.2)
Private insurance, n (%)	58,597 (63.1)	6,779 (45.5)	4,999 (50.5)	356 (31.4)	1,562 (36.0)	119 (31.0)
Public insurance, n (%)	25,376 (27.3)	7,517 (50.5)	4,401 (44.5)	763 (67.2)	2,681 (61.9)	261 (68.0)
Uninsured, n (%)	8,854 (9.5)	599 (4.0)	496 (5.0)	16 (1.4)	90 (2.1)	4 (1)

Note: N = weighted population estimate; n = unweighted estimate. Cardiorenal events include renal disease, ASCVD, and HF. DM + renal, DM + ASCVD, and DM + HF are not mutually exclusive. ASCVD = atherosclerotic cardiovascular disease; DM = diabetes mellitus; HF = heart failure; NH = non-Hispanic.

Table 2. Access Barriers by Diabetes Status

Diabetes group	Access barriers,%	
No DM	10.8	
DM overall	14.5	***

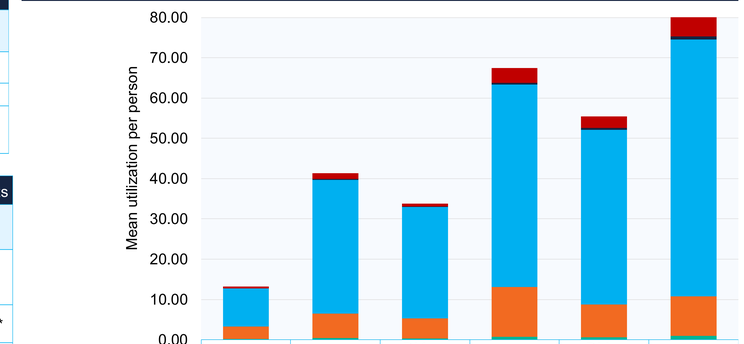
Note: No DM was the reference group. $p < 0.05$; p < 0.01; $p < 0.001$. DM = diabetes mellitus

Table 3 . Access Barriers by Cardiorenal Events

Diabetes group	Access barriers,%	
DM without cardiorenal events	13.3	
DM + renal events	17.7	***
DM + ASCVD events	16.6	***
DM + HF event	14.8	ns

Note: DM without cardiorenal events was the reference group. $p < 0.05$; p < 0.01; $p < 0.001$; ns = not significant. Cardiorenal events include renal disease, ASCVD, and HF. ASCVD = atherosclerotic cardiovascular disease; DM = diabetes mellitus; HF = heart failure.

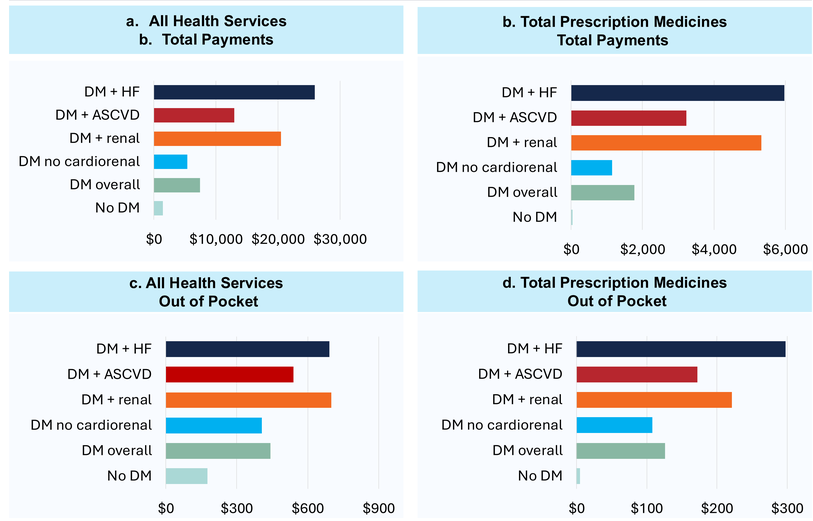
Figure 1. Healthcare Utilization by Diabetes and Cardiorenal Event Status



	No DM	DM overall	DM no cardiorenal	DM + renal	DM + ASCVD	DM + HF
Nights in hospital	0.40	1.40	0.70	3.70	2.90	5.20
Hospital discharges	0.10	0.20	0.10	0.50	0.50	0.80
Prescription medicines	9.40	33.20	27.70	50.20	43.40	63.70
Outpatient visits	3.10	6.10	5.00	12.30	8.00	9.80
ER visits	0.20	0.40	0.30	0.80	0.70	1.00

Note: Values represent the mean number of utilization events per person. Cardiorenal events include renal disease, ASCVD, and HF. DM + renal, DM + ASCVD, and DM + HF are not mutually exclusive. ASCVD = atherosclerotic cardiovascular disease; DM = diabetes mellitus; ER = emergency room; HF = heart failure.

Figure 3. Healthcare Expenditures by Diabetes and Cardiorenal Event Status



Note: Values represent median expenditures per person. Cardiorenal events include renal disease, ASCVD, and HF. DM + renal, DM + ASCVD, and DM + HF are not mutually exclusive. ASCVD = atherosclerotic cardiovascular disease; DM = diabetes mellitus; HF = heart failure.

CONCLUSIONS

- Adults with diabetes had greater access barriers, healthcare utilization, and expenditures than adults without diabetes.
- Among adults with diabetes, cardiorenal events were associated with a higher healthcare burden compared with those without cardiorenal events.
- These findings highlight the need for strategies that improve access to care and reduce the economic burden among adults with diabetes and cardiorenal comorbidities.
- Prevention, early detection, and management of renal disease, ASCVD, and HF may help reduce healthcare utilization and costs for patients with DM.
- Findings should be interpreted considering the limitations of survey-based data, including potential reporting error, missing information, and the cross-sectional nature of the analysis.

REFERENCES

- Shah, C. H., & Dave, C. V. (2022). Healthcare costs associated with comorbid cardiovascular and renal conditions among persons with diabetes, 2008–2019. *Diabetology & Metabolic Syndrome*, *14*(1), 179.
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