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Quality of diabetes care for adults with physical disabilities in Kansas

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Abstract

Background: Similar to health disparities found among racial and ethnic minority groups, individuals with physical disabilities experience a greater risk for diabetes than those without disabilities.

Objective: The purpose of this works was to assess Kansas Medicaid data to determine the quality of diabetic care and the level to which individuals with physical disabilities' prevention and diabetes management needs are being met.

Methods: We selected a continuously eligible cohort of adults (ages 18 and older) with physical disabilities who had diabetes and received medical benefits through Kansas Medicaid. We examined their quality of care measures (screening for HbA1c/glucose, cholesterol, and eye exams; and, primary care visits) in the succeeding year. Using unconditional logistic regression, we assessed the measures for quality of care as they related to demographic variables and comorbid hypertension.

Results: Thirty-nine percent of the 9,532 adults with physical disabilities had diabetes. They had the following testing rates: HbA1c, 82.7%; cholesterol, 51.5%; and eye examinations, 86.8%. Females, those with dual eligibility, and those with comorbid hypertension had higher rates for all types of screenings and primary care visits. Those living in MUAs had a higher screening rate for cholesterol.

Conclusions: Adults with physical disabilities supported by Kansas Medicaid received diabetes quality indicator screenings have better diabetes quality of care rates for 3 out of 4 measures than nationally published figures for Medicaid. These findings point to a strong quality of care programs in Kansas for this population; however an imperative next step is to determine how effectively this population is managing their blood sugar levels day-to-day.

Keywords: Physical disabilities; Diabetes care; Medicaid; Quality of care

The Centers for Disease Control and Prevention estimate that 8.3% of the US population is affected by diabetes, and this number increases each year. Diabetes has many associated complications, including heart disease, stroke, hypertension, blindness, kidney disease, nervous system disease, and death. However, comprehensive diabetes care, including screening of Hb_{A1c} and serum lipids, and annual eye examinations, can effectively minimize the associated sequelae [1].

Some work has been conducted to examine how special populations such as women, children, Hispanics/Latinos, and Native Americans are differentially impacted by diabetes and receipt of the related quality of care measures just noted [2,3]. One group that has received little attention in this regard is people with physical disabilities, as evidenced by the scarcity of relevant studies in the literature. Lack of attention to this segment of the population is especially concerning given that they experience a high risk of developing chronic diseases such as diabetes due to multiple barriers to health promotion and disease management practices. These diabetes and quality of care barriers include lack of transportation, medical facility inaccessibility, inadequate disability training for medical staff, inaccessible fitness facilities, unavailability and inaccessibility of health information, and underinsurance or lack of health insurance coverage [2-7]. (Even people who have insurance are more likely to forgo seeing a doctor because of cost barriers [8].)

Nationally, Medicaid provides critical health insurance coverage for many individuals with physical disabilities [7]. However, Medicaid compliance with recommended health screening levels is lower than Medicare and other insurance providers [1]. For example, prior research has shown that individuals enrolled in Medicaid managed care programs receive fewer diabetes quality of care screenings than individuals who have private health insurance [9], though managed care Medicaid enrollees receive more

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quality of care screenings than the individuals enrolled in Medicaid's fee-for-service programs [10]. Specifically, for 5 of 6 comprehensive diabetes measures—Hb_{A1c} screening, Hb_{A1c} level control, cholesterol screening, cholesterol level control, and nephropathy screening—people enrolled in managed care scored higher by at least 23% than individuals receiving Medicaid fee-for-service diabetes care [10].

Because individuals with physical disabilities face barriers to preventive and quality care and often experience risk factors for diabetes, it is important to improve health surveillance programs that can ultimately help establish quality prevention and diabetes care methods for individuals with disabilities [11]. It has also been recommended that disease management programs include routine screening of individuals with physical disabilities and increase glucose testing of individuals already diagnosed with diabetes or prediabetes [12]. To determine the extent to which these recommendations are adequately implemented in our state, we assessed Kansas Medicaid data to determine the quality of diabetic care and the level to which individuals with physical disabilities' prevention and diabetes management needs are being met.

Methods

We conducted a retrospective cohort analysis for quality of care measures among adults (ages 18 and older) with physical disabilities and diabetes who received medical benefits through Kansas Medicaid. The Kansas Medicaid program provides insurance coverage for inpatient, outpatient, pharmacy, long term care and hospice coverage to adults with disabilities who qualify for Supplemental Security Income (SSI), have high medical needs, qualify for Medicare, or have a severe disability and are awaiting permanent federal disability status. Each of these programs has its own income qualifications. To establish the cohort, we first requested a listing of all people supported by the Home and Community Based Services Physical Disability (HCBS PD) waiver. By definition, this includes, "individuals age 16 to 65 years of age who meet the criteria for nursing facility placement due to their physical disability, who are determined disabled by social security standards, and who are Medicaid eligible" [13, p. 1]. From this sampling frame, we identified persons with diabetes-related claims during a 12-month period (July 2007-June 2008) and tracked their quality of care in the subsequent 12-month period (July 2008-June 2009). All study subjects were continuously eligible for the entire 24 months.

We identified persons with diabetes by searching Medicaid inpatient and outpatient services claims paid between July 2007 and June 2008 for diabetes diagnosis codes (ICD-9 codes 250.xx; 357.xx; 362.xx; 366.xx). We also searched for major classes of diabetes medications in the Medicaid paid prescription drug claims (alpha-glucosidase inhibitors, amylinomimetics, biguanides, incretin mimetics, insulins, meglitinides, sulfonylureas, thiazolidinediones, and diabetic supplies and diagnostics). A person with 2 or more outpatient codes or any inpatient or prescription based code was identified as a person with diabetes.

Quality of diabetes monitoring

We modeled the main outcomes of interest on the HEDIS 2010 measures for quality of care for diabetes: evidence of lipid testing, eye examinations, glucose testing including HbA1c, and primary care visits during the 12-month monitoring period [4]. We used Current Procedural Terminology (CPT) codes to identify targeted services (Table 1). Evidence for any of these types of services was classified dichotomously according to whether at least one occurrence was noted during the 12-month period.

Demographics and comorbid hypertension

We derived basic demographic characteristics from Medicaid eligibility files: age, sex, race, MUA/non-MUA,

Table 1
Procedure codes used to identify diabetes quality care indicators from outpatient claims

Hb_{A1c}/Glucose	Cholesterol	Eye examination			PCP visits
80048	0026 T	2022F	67210	92240	99050-99051
80050	80061	5010F	67218	92250	99053
80053	82465	67028	67220	92260	99056
82947-82948	83718-83719	67030	67221	99203	99060
82950-82952	83721	67031	67227	99204	99201-99205
82962	83700	67036	67228	99205	99211-99215
83036	83701	67038-67040	92002	99213	99241-99245
83037	83704	67101	92004	99214	99271-99275
	83715	67105	92012	99215	99354-99355
	83716	67107	92014	99242	99381-99387
	84478	67108	92018	99243	99391-99397
		67110	92019	99244	99429
		67112	92225	99245	99441-99443
		67121	92226	G8325	D9430
		67141	92230	G8329	D9440
		67145	92235	G8333	
		67208		G8397	

and dual eligibility (Medicare-Medicaid). We calculated age means and grouped ages as 18 to 30 years, 31 to 50 years, and 51 or more years. These categories were chosen as a result of an a priori belief that primary care providers might manage patients differently according to age group. We expected 18- to 30-year-olds to have fewer complications than older peers (31 to 50 years). Additionally, health care prevention strategies change in some ways after age 50; however, these categories are ultimately arbitrary. We dichotomized race as Caucasian versus other: Caucasians accounted for 76.5% of the study population. African Americans were the next largest racial group with 17.9%. These 2 race categories combined left too few others to analyze separately. (For the same reason, we did not categorize groups according to Hispanic ethnicity.) Based on initial work showing hypertension as the most frequent chronic comorbidity linked to cardiac health, we also screened for the presence of comorbid hypertension by looking for 2 or more outpatient claims with diagnosis codes (ICD-9 401 to 405). Finally, we used eligibility codes to determine which individuals were dually eligible for Medicare coverage. Having Medicare eligibility at least 1 month during the follow-up period indicated a person as dually eligible. Our data included cross-over claims (eg, claims that were submitted first to Medicare and subsequently submitted to Medicaid) which we included in our assessment of quality measures; there is, however, the possibility that some providers did not bill Medicaid for remaining financial liabilities.

Analysis

For continuous variables, we computed mean and standard deviation, and for discrete variables, we computed frequency or percentage. We used χ^2 tests to examine bivariate associations between monitoring tests and physician visits and underlying demographics. We used unconditional logistic regression in a stepwise fashion ($p < .10$ to enter and $p < .05$ to remain) to model the probability of individual monitoring tests separately with all covariates simultaneously. We used IBM SPSS Statistics version 18 to conduct data manipulation and statistical analyses [14].

Human subjects review

We received the claims data used in this analysis from The Kansas Health Policy Authority (KHPA) through an interagency business associates agreement. The University of Kansas Human Subjects' Committee approved the study protocol.

Results

There were 9532 people continuously enrolled in the HCBS PD waiver in 2008. Their mean age was 53.5 years with almost two-thirds of the group over age 50 years. The PD waiver group was also mostly Caucasian (79.2%), female (65.3%), and residing in an MUA (78.4%). Thirty-nine percent of this PD waiver cohort had diabetes. The mean age of persons with diabetes was 4.48 years older than those without diabetes (Table 2). Those with diabetes were slightly less likely to be Caucasian but more likely than those without diabetes to be female, live in an MUA, and have hypertension. Seventy-two percent had comorbid hypertension, compared to those without diabetes with a rate of 40.6%.

Quality of diabetes care indicators

For 3 of 4 quality of care indicators, the rate of receipt was respectable. The highest screening rate was for eye exams (86.8%), followed by glucose or Hb_{A1c} tests (82.7%), and cholesterol screenings (51.5%). In addition, during the 1-year period, 87.0% had a visit with a primary care provider.

Factors associated with quality of diabetes care indicators

Table 3 shows the bivariate associations between the outcomes and individual covariates. Hb_{A1c}/glucose monitoring rates in the year of interest were significantly higher for females (84.0%) compared to males (79.6%), those with dual eligibility (87.6%) compared to those without dual

Table 2
Descriptive characteristics of adults with physical disabilities (pd) and diabetes in Kansas Medicaid

	PD with diabetes (n = 3722) (39.0%)	PD without diabetes (n = 5810) (61.0%)	*p* values[a]	PD overall (n = 9532)
Age				
Mean	56.25	51.77	0.00	53.52
18-30 y	1.2%	6.3%	0.00	4.3%
31-50 y	23.6%	35.7%	0.00	31.0%
>50 y	75.2%	58.0%	0.00	64.7%
Race				
Caucasian	77.2%	80.4%	0.00	79.2%
Non-Caucasian	22.8%	19.6%	0.00	20.8%
Sex				
Male	29.5%	38.1%	0.00	34.7%
Female	70.5%	61.9%	0.00	65.3%
Residence				
Medically underserved area (MUA)	79.9%	77.5%	0.01	78.4%
Non-MUA	20.1%	22.5%	0.01	21.6%
Dual Medicare eligibility				
Dual	65.5%	64.3%	0.23	64.8%
Nondual	34.5%	35.7%	0.23	35.2%
Comorbid HTN				
Hypertension	72.1%	40.6%	0.00	52.9%
No hypertension	27.9%	59.4%	0.00	47.1%

[a] Null hypothesis: There is no difference in the sample between those with and without diabetes with respect to age, race, sex, MUA status, dual eligibility status, and comorbid hypertension.

Table 3
Distribution of diabetes care indicators by subject characteristics among adults with physical disabilities and Diabetes in Kansas Medicaid[a]

	Hb_{A1c}/glucose		Cholesterol screening		Eye examination		Primary care physician visit	
		p value		*p* value		*p* value		*p* value
Overall	82.7%		51.5%		86.8%		87.0%	
Age, distribution								
18-30 y	75.0%	.06	38.6%	.21	84.1%	.14	84.1%	.15
31-50 y	85.0%		52.2%		88.7%		88.9%	
50-65 y	82.1%		51.4%		86.2%		86.4%	
Sex								
Male	79.6%	.00	48.0%	.01	83.9%	.00	84.2%	.00
Female	84.0%		52.9%		88.0%		88.1%	
Race								
Caucasian	82.8%	.89	51.3%	.67	87.2%	.17	87.4%	.12
Non-Caucasian	82.6%		52.1%		85.4%		85.4%	
Residence location								
Medically underserved area (MUA)	82.3%	.18	50.7%	.07	87.0%	.53	87.2%	.37
Non-MUA	84.4%		54.5%		86.1%		86.0%	
Dual Medicare eligibility								
Dual	87.6%	.00	53.3%	.00	92.0%	.00	92.3%	.00
Non-dual	73.5%		48.0%		76.9%		76.9%	
Comorbid hypertension								
Hypertension	84.7%	.00	54.9%	.00	88.4%	.00	88.6%	.00
No hypertension	77.7%		42.7%		82.7%		82.8%	

[a] Null hypothesis: There is no difference in the sample between those with and without diabetes with respect to age, race, sex, MUA status, dual eligibility status, and comorbid hypertension.

eligibility (73.5%), and among those with comorbid hypertension (84.7%) compared to those without hypertension (77.7%).

Similarly, cholesterol screening rates were significantly higher for females (52.9%) than males (48.0%), those with dual eligibility (53.3%) than those without dual eligibility (48.0%), and those with hypertension (54.9%) than those without hypertension (42.7%). Females (88.0%) had significantly higher rates for eye examinations than males (83.9%), as did those with dual eligibility (92.0%) compared to those without dual eligibility (76.9%), and those with hypertension (88.4%) compared to those without hypertension (82.7%). In addition, females (88.1% vs 84.2%), Caucasians (87.4% vs 85.4%), those with dual eligibility (92.3% vs 76.9%), and those with comorbid hypertension (88.6% vs 82.8%) had significantly more primary care physician visits than their comparators.

Overall, the multivariate results (Table 4) were similar to the bivariate results. Members of the 31- to 50-year-old age group (adjusted odds ratio [AOR] = 1.41; 95% confidence interval [CI], 1.14-1.75), women (AOR = 1.48; 95% CI, 1.23-1.78), dual eligible persons (AOR = 2.75; 95% CI, 2.31-3.29), and those with comorbid hypertension (AOR = 1.74; 95% CI, 1.45-2.10) were significantly more likely to have received the Hb_{A1c} test.

Cholesterol screening was also more likely to occur for women (AOR = 1.25; 95% CI, 1.08-1.44), those with dual eligibility (AOR = 1.28; 95% CI, 1.11-1.47), and those with comorbid hypertension (AOR = 1.67; 95% CI, 1.44-1.94). People living in MUAs (AOR = 0.83; 95% CI, 0.70-0.98) were less likely to receive cholesterol screening. Women (AOR = 1.60; 95% CI, 1.30-1.97), those in the 31- to 50-year-old age group (AOR = 1.48; 95% CI, 1.16-1.89), those with dual eligibility (AOR = 3.82; 95% CI, 3.13-4.68), and those with comorbid hypertension (AOR = 1.82; 95% CI, 1.47-2.24) were significantly more likely to receive an eye exam.

People aged 31 to 50 years (AOR = 1.47; 95% CI, 1.15-1.88), women (AOR = 1.57; 95% CI, 1.27-1.93), those with dual eligibility (AOR = 3.91; 95% CI, 3.19-4.79), and those with comorbid hypertension (AOR = 1.84; 95% CI, 1.49-2.28) were more likely to visit a primary care physician.

Discussion

Thirty-nine percent of a cohort of persons enrolled in the Kansas Medicaid HCBS waiver for physical disabilities had

Table 4
Quality of diabetes care and physical disabilities: odds ratios for demographics related to quality of care measures

	Hb_{A1c}/Glucose				Cholesterol Screening			
	AOR	*p* value	95% CI		AOR	*p* value	95% CI	
Age								
18-30 y	0.99	.98			0.75	.36		
31-50 y	1.41	.00	1.14	1.75	1.10	.22		
>50 y	N/A				N/A			
Female	1.48	.00	1.23	1.78	1.25	.00	1.08	1.44
Caucasian	0.93	.48			0.98	.80		
Medically underserved area	0.85	.15			0.83	.03	0.70	0.98
Dual eligibility	2.75	.00	2.31	3.29	1.28	.00	1.11	1.47
Hypertension	1.74	.00	1.45	2.10	1.67	.00	1.44	1.94

diabetes. This number was much higher than expected based on prevalence rates noted in the literature for people with physical disabilities [5-7]. The rates likely underestimate the true prevalence for people with physical disabilities since we relied on administrative claims data to ascertain diabetes. Actual laboratory and physical exams would likely find more cases of diabetes and prediabetes. For this cohort of persons with diabetes, quality of care measures overall indicated promising rates of comprehensive screening, notably Hb_{A1c}/glucose testing (82.7%), and eye exams (86.8%), as well as nearly universal access to primary care providers (87.0% had an office visit). Cholesterol screening was, however, at a substandard rate of 51.5%.

There is little research describing the prevalence rate of chronic disease, such as diabetes, for people with physical disability [5]. In part, this is due to the difficulty of identifying specific disability groups (eg, physical disability, intellectual disability, mental health) using existing datasets. McDermott, Moran, Platt, and Dasari [5] found that people with spinal cord injury or traumatic brain injury have a diabetes prevalence rate of 9.1%, while those with a traumatic brain injury have a prevalence rate of 18.2%. Jones and Sinclair [6] reported a diabetes prevalence rate of 13.4% for individuals with mobility impairments [15]. Rasch, Hochberg, Magder, Magaziner, and Altman [7] reported an age-adjusted prevalence rate of diabetes among people with mobility limitations as 10.0%. In addition, Cohen [9] found that people with disabilities, broadly, who are supported by Medicaid have a national diabetes prevalence rate of 13%. Reichard, Stolzle, and Fox (2011) reported an age-adjusted prevalence rate of 15.1% for diabetes among those with physical disabilities [22]. Our rates are 2- to 3-fold higher for a cohort defined as having a physical disability. Methodological differences provide one explanation for the difference; with the exception of Cohen [9], no other studies focused specifically on those supported by Medicaid. It is well established that adult Medicaid beneficiaries, especially those with disabilities, have higher prevalence rates for chronic conditions so we would expect our sample to have a higher prevalence rate [10,11]. In addition, Cohen [9] did not subdivide her data by type of disability, but instead included all adults with disabilities in her estimate of diabetes prevalence among Medicaid beneficiaries. A strength of our methods for this study is that we were able to identify people with physical disabilities from the total adult Medicaid population. This is important because prevalence rates and quality of care indicators can differ between each disability subgroup and, as a result, strategies for addressing these may vary. Given that by definition some in our cohort may have been categorized as having a physical disability due to their diabetes, it is not surprising that those with a physical disability have a higher prevalence rate for this disease than other segments of the disability population supported by Medicaid. However, whether disability is primary or secondary is immaterial to the importance of maintaining quality of care screening in this population, and it does not affect environmental determinants of health care quality and access.

Adults with physical disabilities and diabetes supported by the Kansas Medicaid program received screening services in 1 year comparable to the rates for quality key indicators reported for Medicaid programs nationally. NCQA reported similar rates for Hb_{A1c} screening for Medicaid beneficiaries (80.6%, Medicare 89.6%, and commercial 89.2%) to what we found among our study group (82.7%). The eye tests occurred far more often for our study group (86.8%) than for Medicaid (52.7%) and Medicare and commercial ($>$56.5%) plan nationally. A greater disparity exists for cholesterol screening rates reported by NCQA for Medicaid (74.2%) and Medicare and commercial plans ($>$85.0%) in comparison to our study group (51.5%). Kansas Medicaid should be pleased with these findings, overall. Kansas Medicaid covers routine laboratory exams such as Hb_{A1c} and cholesterol screening. However, Kansas Medicaid should encourage a higher standard of care among providers for cholesterol screening to improve the state's diabetes quality of care for this population.

Substantial empirical research has documented the gaps in health care between individuals with and without a disability [12,16,17] and has shown that people with disabilities frequently have greater health concerns [18,19] and greater vulnerability for secondary conditions [16,20-22]. Research has also reported greater unmet health care needs and receipt of fewer preventive services than the general population [23-25]. These studies suggest that environmental barriers prevent access to this care.

Our research, unlike the national data [4], indicated that 3 of 4 diabetes quality of care screenings for individuals with physical disabilities in Kansas meet established standards of care. Additional work is needed to examine these patterns in other states and private health plans. We also must conduct further work to better understand whether people with physical disabilities are effectively managing their blood sugar levels, not just receiving regular screenings. One concern is that in Kansas and other states, Medicaid does not cover diabetes self-management education, an evidence-based practice that has been demonstrated to reduce health care costs and improve health outcomes [26-29]. This is of particular concern to this segment of the disability population given the high prevalence rate for diabetes.

We are also concerned that people with physical disabilities and diabetes (and other chronic conditions) may not be accessing the care that they need. Nearly 7% of those in this study who were identified as having diabetes in FY08 had no claims for outpatient care in FY09. Although some proportion of these may have moved out of state or died, the requirement for continuous eligibility should have rendered this proportion to be small. It remains unclear why these individuals did not receive any outpatient care,

but it is especially concerning because, based on findings from other research [22,30], diabetes is likely not their only chronic condition.

Team-based approaches including health care providers, case workers, community care coordinators, and health educators will likely have the greatest success with a diabetes quality improvement program for people with physical disabilities. Studies have already begun to show the effectiveness of this method and the importance of training physicians early in their education how to accommodate this new way of thinking in health care services [31-35].

Limitations

Our methods included analysis of only paid administrative claims and eligibility data for Kansas Medicaid. These included crossover claims from other payers, primarily Medicare, but quality of care measures are likely underreported because providers sometimes do not bill Medicaid for charges remaining after Medicare coverage. In addition, diabetes and hypertension are likely underreported as we used diagnosis codes to identify them; diabetes is likely more accurate given that we supplemented the diagnosis codes with pharmacy claims for tracer medications to improve identification. Because these results represent only one state in the Midwest, they may not be widely generalizable; however, it is important to note that each state's Medicaid program has different eligibility and benefit criteria, which means that each state's program must be examined individually. This study and a similar study of individuals with intellectual and development disabilities published earlier [36] are the first we are aware of to use this methodology with Medicaid claims data. We hope that other state Medicaid programs will use our model of identifying subgroups of disability populations and conduct similar analyses for their state to validate or refute our findings.

Conclusions

The results presented here reveal that, with the exception of cholesterol, individuals with physical disabilities supported by Kansas Medicaid have better diabetes quality of care measure rates than nationally reported statistics. Given the high costs and poor quality of life associated with unmanaged diabetes, along with established standards and benefits of proactive comprehensive care, these findings point to a strong quality of care programs in Kansas for this population. While this finding is encouraging, the extraordinarily high prevalence of diabetes in this population warrants further investigation. It is quite likely that diabetes may have been the chronic condition leading to the disability, reflecting poor quality of care and control earlier in their lives, or there are modifiable risk factors, eg, obesity, that contribute to the excessive prevalence rate. Better management at earlier stages would likely relieve cost burdens on public programs.

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