Benzodiazepine Use in the USA Is Driven by Long-term Users: a Repeated Cross-sectional Study of MEPS 2002–2016

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INTRODUCTION

Benzodiazepines can be an effective short-term adjunct for psychiatric conditions managed in the outpatient setting.[1] Recent studies on benzodiazepine prescribing reveal increases in concurrent opioid prescribing[2] and prescribing in the ambulatory setting.[3] Other reports document increase overdose mortality from benzodiazepines over the past decade secondary to concurrent opioid use.[4] Despite this, less is known about how individuals use benzodiazepines over time. Without knowing how individuals use this medication, the abovementioned measures may overestimate benzodiazepine use. We thus sought to describe benzodiazepine use among the adult population using longitudinal cohort data.

METHODS

A repeated cross-sectional study was conducted using the 2002–2016 Medical Expenditure Panel Survey (MEPS).[5] MEPS is an annual survey that is nationally representative of the noninstitutionalized US population and collects demographics, self-reported medical conditions, health indicators, and prescription medication use. This study utilized the longitudinal survey, which tracked individuals for 2 years who were interviewed five times.

Adults (≥ 18 years old) alive through the entirety of the 2 years were included. Benzodiazepine fills were identified by both therapeutic classification category and prescription medication name (temazepam, alprazolam, lorazepam, chlordiazepoxide, clonazepam, clorazepam, diazepam, estazolam, flurazepam, oxazepam, triazolam). Benzodiazepine fills were adjusted to 15 if more than 15 fills were reported.

Adjusted Wald test and chi-squared statistic were used for bivariate analyses. Simple linear regression was used to determine the relationship between first- and second-year benzodiazepine fills. A multivariable logistic regression was used to predict any benzodiazepine use in year 2 based on the number of benzodiazepine fills in year 1 (interaction between benzodiazepine fills). STATA 15 (STATA Corp.) and survey weighting were used for analyses. The OhioHealth Institutional Review Board ruled the study to be exempt.

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RESULTS

The study included 154,171 adults. The rates of chronic benzodiazepine use (both > 2 fills in both years and any fills in both years) increased throughout the study period (Fig. 1). The rate of individual benzodiazepine use (> 2 fills in both years) increased from 1.8% (95%CI 1.5–2.1) in 2002–2003 to 2.4% (95%CI 2.1–2.8) in 2015–2016; however, the rate of individuals who reported benzodiazepines for a single year was unchanged at 1% per year. Any benzodiazepine filled in both years also increased from 2.8% (95%CI 2.4–3.2) in 2002–2003 to 3.9% (95%CI 3.5–4.4) in 2015–2016, while the rate of individuals reporting a fill in a single year was unchanged at 1.8%.

In bivariate analyses, individuals without benzodiazepine fills were more likely to be younger, male, white (non-Hispanic), and of middle to high income, and to have a higher mental component score on the Short-Form 12 (SF-12) (Table 1). Individuals who reported benzodiazepine fills over 2 years compared with a single year were overall similar. The number of fills in the first year was correlated with that in the second year ($R^2 = 0.62$). The likelihood of any benzodiazepine filled in the second year increased from 36% (95%CI 33–39) at 2 fills to ≥ 86% in the second year with ≥ 4 fills.

DISCUSSION

Using nationally representative data over a 14 year period found that the increase in benzodiazepine prescriptions is related to a small increase in the number of long-term users, which might have decreased in 2015–2016. Predictors of long-term use were similar to those of previous studies,[4,6] namely, non-Caucasian White patients, female sex, and lower income.

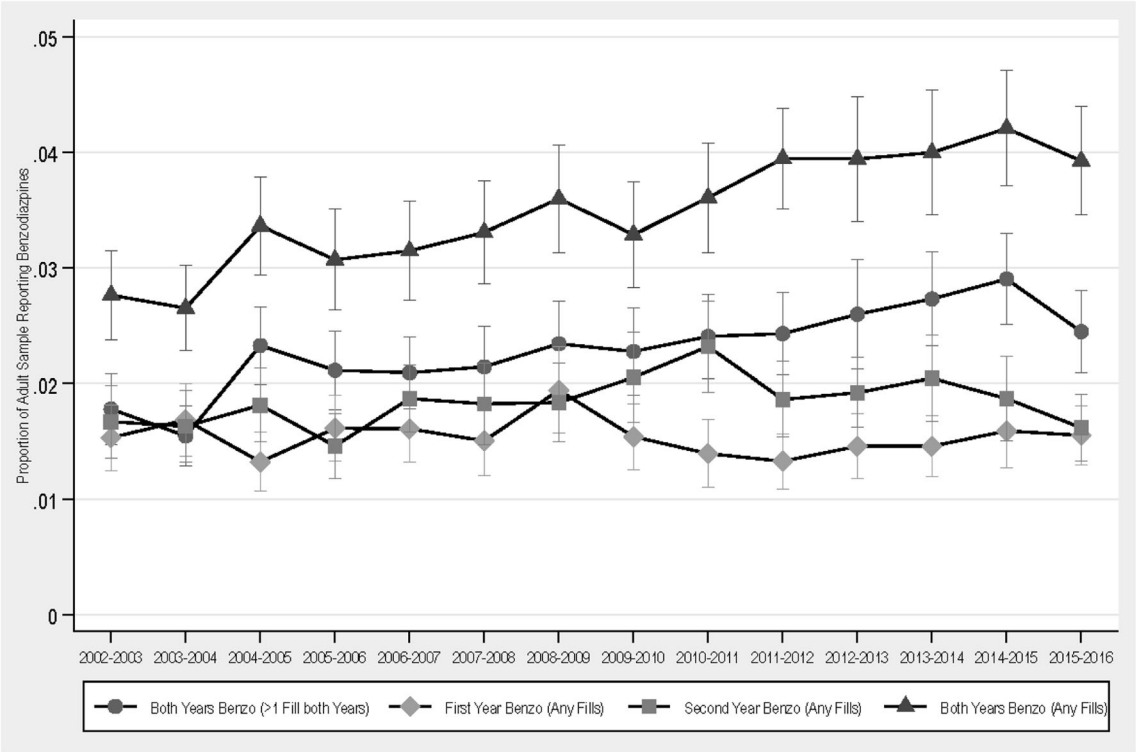

Figure 1 Rates of benzodiazepine use in the USA, 2002–2016. Abbreviations: Benzo, benzodiazepine. The figure represents the proportion of the MEPS adult sample reporting a prescription fill for a benzodiazepine. Represented rates include the entire adult population with any benzodiazepine fills in the MEPS survey in the first year ("first year benzo (any fills)"), second year ("second year benzo (any fills)"), and both years ("both years benzo (any fills)"). Additionally, the rate of long-term benzodiazepine use with > 1 fills in both years ("both years benzo (> 1 fill both years)") is represented and is the driver for the increasing slope of "both years benzo (any fills)". MEPS represents the Medical Expenditure Panel Survey.

This study was limited by self-reported medication use, and short-term medications are likely underreported.

Recent studies have focused on benzodiazepine prescribing overtime by studying change in total outpatient

Table 1 Demographic Characteristics of Benzodiazepine Prescription Fills in the USA, 2002–2016

	No Benzo fills	> 2 Benzo fills in 1 year	> 2 Benzo fills in both years
n	148,274	2573	3324
Proportion	95.9% (95.7–96.0)	1.8% (1.7–1.9)	2.3% (2.2–2.4)
Age (median [IQR])[a,b,c]	44 (31, 58)	53 (41, 65)	55 (46, 66)
Sex (% female)[d]	51.2 (50.9–51.5)	66.9 (64.5–69.2)	66.0 (64.2–67.7)
Race/ethnicity[d]			
White (non-Hispanic)	66.8 (65.5–68.0)	81.4 (79.7–83.0)	83.9 (92.3–85.5)
Black (non-Hispanic)	11.6 (10.8–12.4)	6.7 (5.8–7.7)	5.1 (4.3–6.1)
Hispanic	14.3 (13.2–15.4)	8.2 (7.1–9.5)	7.3 (6.3–8.5)
Asian (non-Hispanic)	5.2 (4.6–5.8)	1.3 (0.9–1.8)	0.7 (0.5–1.1)
Other	2.1 (1.9–2.4)	2.4 (1.8–3.2)	2.9 (2.3–3.7)
Poverty category[d]			
Poor/near poor/low income	29.6 (28.9–30.3)	39.5 (37.2–41.9)	43.9 (41.8–46.1)
Middle income	30.9 (30.5–31.3)	29.6 (27.5–31.8)	29.2 (27.2–31.3)
High income	39.5 (38.7–40.3)	30.9 (28.5–33.4)	26.8 (24.7–29.1)
Region[d]			
Northeast	18.6 (17.7–19.6)	17.6 (15.5–20.0)	17.2 (15.1–19.4)
Midwest	21.7 (20.6–22.9)	22.9 (20.6–25.3)	24.4 (22.1–26.8)
South	36.4 (35.0–37.8)	40.3 (37.5–43.1)	41.3 (38.6–44.1)
West	23.3 (22.1–24.5)	19.2 (17.0–21.6)	17.2 (15.3–19.2)
MCS (IQR)[c,e] (year 1 or year with Benzo fills)	54.1 (46.6, 57.6)	43.9 (34.5, 52.7)	41.7 (31.4, 51.4)
MCS (IQR)[c,e] (year 2 or year with no Benzo)	54.2 (47.0, 57.9)	45.4 (36.4, 54.1)	42.0 (32.2, 51.5)

Benzo, benzodiazepine; IQR, interquartile range; MCS, mental component summaries
[a]p < 0.001 compares no Benzos to single year
[b]p < 0.001 compares no Benzo fills to > 2 Benzo fills in both years
[c]p < 0.001 compares single year Benzo fills to both year Benzo fills
[d]p < 0.001 by chi-squared statistic
[e]p < 0.001 comparing MCS for year with > 2 Benzo fills vs year without > 2 Benzo fills

visits,[3, 6] which are likely overestimating use of this medication. In contrast, the results of our study suggest comparatively lower rates and lower rates of changes of benzodiazepine use. Additionally, the increased trends were mostly isolated to an increase use in the number of long-term users. Focusing on data related to change in visits overtime or cross-sectional time points may lead to incomplete understanding of prescribing patterns, which could have deleterious effects through health policy.

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Compliance with Ethical Standards:

The OhioHealth Institutional Review Board ruled the study to be exempt.

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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