

Cross-sectional Evaluation of Chronic Medication Use Across Age Categories

Alecia N. Muwonge (M.S.)*; Nedra Geddes-McCarthy (B.Sc.)*; Elizabeth Sherman, Pharm.D., AAHIVP; Alexandra Perez, M.S., PharmD

*PharmD Candidates, Class of 2023

Nova Southeastern University College of Pharmacy

Introduction

- ❖ Physiological aging is associated with increased multimorbid conditions such as cardiovascular, renal, hepatic, and depressive disorders, as well as geriatric syndromes.¹
- ❖ Management of multimorbid conditions requires complex medication management which may lead to polypharmacy, a prevalent problem in the adult population.^{2,3}
- ❖ Previous studies investigated the prevalence of chronic medication use in older adults, but none have recently quantified the trends in use with increasing age.
- ❖ Understanding the underlying causes of accelerated physiological aging can help to inform earlier interventions to reduce the impact of chronic diseases.

Objective

The objective of this study was to estimate the use of chronic medications for hypertension, hyperlipidemia, hyperglycemia, and depression in adults 18 years of age and older.

Methods

National Health and Nutrition Examination Survey (NHANES) which is a part of the National Health and Survey Act of 1956 was used to conduct this study.

Data Source

Collects demographic, health conditions, physical examination, behavioral, and laboratory data cross-sectionally on a biannual basis.

NHANES is a cross-sectional survey that collects and monitors the health status of U.S. civilians who reside in the U.S and are neither militarized nor institutionalized.

Four biennial cohorts from 2011 to 2018 were chosen for this study.

Methods (Continued)

Study Design

- ❖ Prospective cross-sectional survey

Inclusion Criteria

- ❖ 18 years of age and older

Exposures

- ❖ Use of any chronic medications defined in this study as the use of either antihypertensive, antilipidemic, antihyperglycemic, or antidepressants in the past 30 days from the survey interview

Sample descriptors

- ❖ Age at time of survey interview
- ❖ Gender
- ❖ Race/ethnicity

Statistical Analysis

- ❖ Descriptive statistics for categorical (count, percentage, and 95% CI) variables used to describe the use of chronic medications per age category.
- ❖ Univariate logistic regression models to assess the association of ‘any’ chronic medication use against age range categories.
- ❖ Crude odds ratios and respective 95% CI were reported.
- ❖ Alpha level of 5% for significance
- ❖ The IBM SPSS v27 was used to conduct this analysis.
- ❖ All estimates are nationally representative.

Results

Sample Descriptors	Count (n)	Percentage (%)
Age		
18-24	3105	12.4
25-35	4152	19.2
36-45	3729	16.9
46-55	3710	17.6
56-65	3987	16.7
66+	5069	17.2
Gender		
Male	11485	48.1
Female	12267	51.9
Race/Ethnicity		
Mexican American	3291	8.9
Other Hispanic	2493	6.4
Non-Hispanic White	8609	64.2
Non-Hispanic Black	5369	11.4
Non-Hispanic Asian	3107	5.6
Other races including multi-racial	883	3.4

Table 1: Sample Characteristics

- ❖ A total of 23,752 participants were included in our study.
- ❖ 9,037 (36.7%; 95% CI 35.4-38.0) reported taking ‘any’ chronic medication (i.e. antihypertensive, antilipidemic, antihyperglycemic, or anti-depressive agent) (Table 2)

Results (Continued)

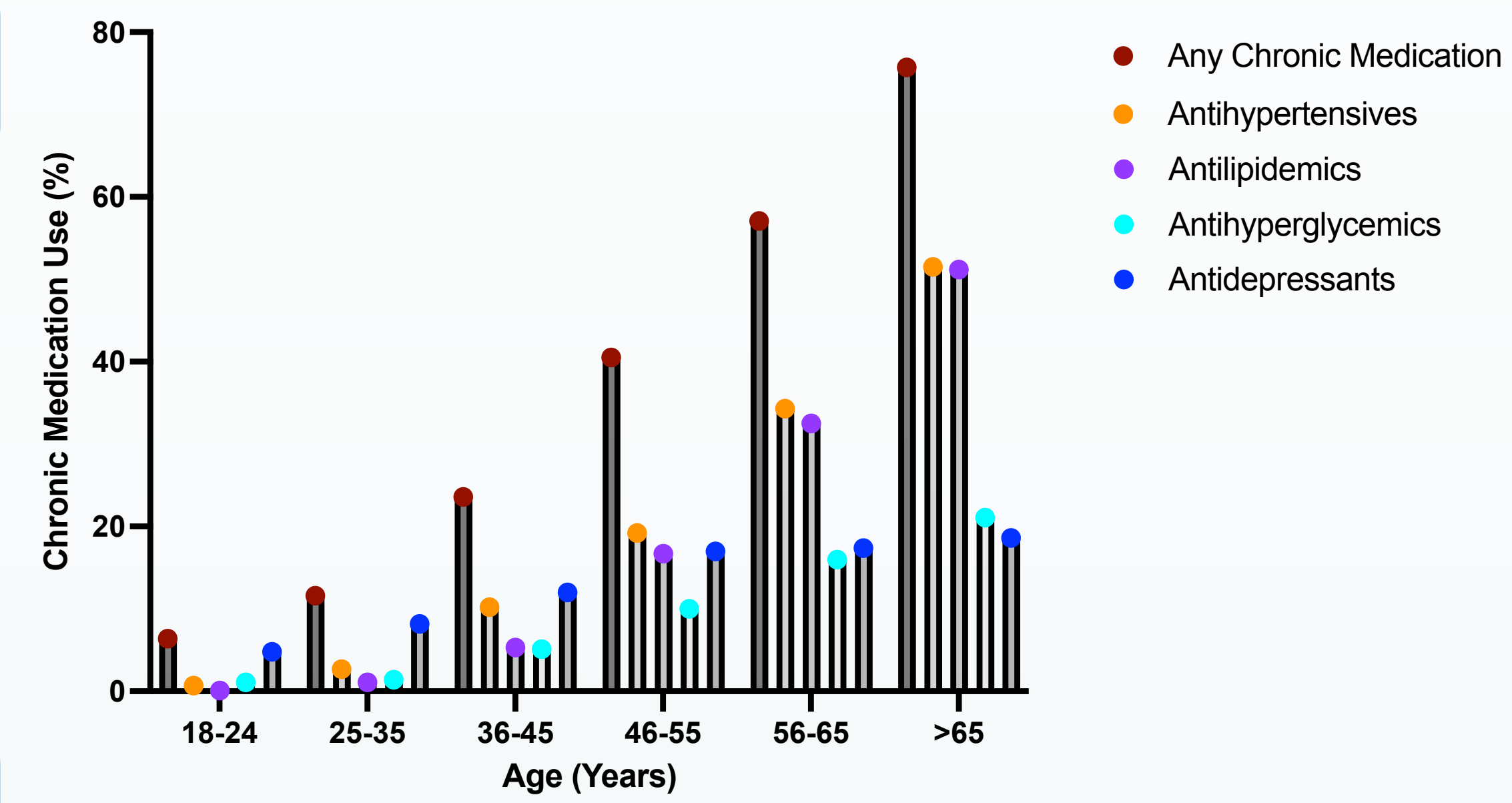


Figure 1: Percentage medication use per age category

- ❖ 5,625 (20.3%) participants took an antihypertensive
- ❖ 4,698 (18.3%) took an antilipidemic
- ❖ 2,874 (9.3%) took an antihyperglycemic
- ❖ 2,520 (13.3%) took an antidepressant

Using the 18-24 age range as a reference:

- ❖ Chronic medication use increased with advancing age (Figure 1) from 6.4% in the 18-24 age range to 75.7% in those >= 66 years (p<0.05) (Table 2)
- ❖ Persons in the 25-35 age range were 1.99 times as likely to use ‘any’ chronic medication (95% CI 1.512-2.416; p<0.05) while persons who were 66 years of age and older were 45.5 times more likely (95% CI 34.32-60.32; p<0.05).
- ❖ Anti-depressant use was more prevalent than other drug classes in the 18-24 (n=106; 4.8%), 25-35 (n=260; 8.2%), and the 36-45 (n=351; 12%) age groups compared to older age categories.

Chronic Medications	18-24	25-35	36-45	46-55	56-65	66+	p value
Any chronic medication	157 n 6.4 % Ref	408 11.6 23.6 1.99	810 23.6 40.5 4.508	1445 40.5 57.1 9.940	2343 57.1 75.7 19.492	3874 75.7 45.502	<0.0005
95% CI	Ref	1.5-2.4	3.6-5.7	7.7-12.9	15.1-25.2	34.3-60.3	
Antihypertensive	18 n 0.7 %	115 2.7	391 10.2	802 19.2	1522 34.3	2777 51.5	<0.0005
Antilipidemic	4 n 0.1 %	35 1.1	186 5.3	624 16.7	1296 32.5	2553 51.2	<0.0005
Antihyperglycemic	38 n 1.1 %	65 1.4	217 5.1	460 10.0	827 16.0	1267 21.1	<0.0005
Antidepressant	106 n 4.8 %	260 8.2	351 12	466 17	566 17.4	771 18.6	<0.0005

Table 2: The association of chronic medication use by age categories

Discussion and Conclusions

- ❖ This is the most recent national study to quantify chronic medication use for hypertension, dyslipidemia, diabetes, and depression per age category.
- ❖ Results of our study indicate that older adults are up to 45 times more likely to be on select chronic medication.
- ❖ There is an observed increase in the use of chronic medications for metabolic disorders as the population ages, whereas use of medications for mental health disorders is more prevalent in younger adults.
- ❖ The findings of this study can be used to compare the use of chronic medications in other disease states and how this is influenced by chronological age.

Limitations

- ❖ The data available in NHANES is cross-sectional which limits the types of studies that can be conducted. Like all cross-sectional studies, only a snapshot at a point in time are provided which are not indicative of changing medication use over longer periods.
- ❖ This study cannot evaluate the age at which each chronic medication regimen was initiated because this data is not available in NHANES.

References

1. Pathai S, Bajillan H, Landay AL, High KP. Is HIV a model of accelerated or accentuated aging?. *J Gerontol A Biol Sci Med Sci.* 2014;69(7):833-842. doi:10.1093/gerona/glt168
2. Goodman RA, Posner SF, Huang ES, Parekh AK, Koh HK. Defining and measuring chronic conditions: imperatives for research, policy, program, and practice. *Prev Chronic Dis.* 2013;10:E66. Published 2013 Apr 25. doi:10.5888/pcd10.120239
3. Ward BW, Schiller JS, Goodman RA. Multiple chronic conditions among US adults: a 2012 update. *Prev Chronic Dis.* 2014;11:E62. Published 2014 Apr 17. doi:10.5888/pcd11.130389

Supplemental Data

