Correlation of self-reported pain severity and healthcare expenditures in older United States adults

Tyler Pesqueira, AS; Briana Jarrell, AA; Dominic Dicochea, AS; David Rhys Axon, PhD, MPharm, MS

Contact: Tjpesqueira@pharmacy.arizona.edu; bmjarrell@pharmacy.arizona.edu; drdicochea@pharmacy.arizona.edu; axon@pharmacy.arizona.edu

THE UNIVERSITY OF ARIZONA College of Pharmacy

Pharmacy

Introduction

- Healthcare expenditures of older United States (US) adults with different pain severity levels are relatively unknown.
- Estimates of chronic pain in the U.S. population from the literature vary from 41 to 116 million[1,2].
- Pain also has a considerable financial burden, for example, lost productivity from missed work due to pain amounted to $11.6 to $12.7 billion per year, and pain cost $560 to $635 billion per year in 2010 US dollars.[3]

The objective of this study was to assess the correlation of healthcare expenditures among older US adults with different pain severity levels, hypothesizing that expenditures would increase as pain severity increased.

Discussion

- This study used a retrospective cross-sectional database design and 2018 Medical Expenditure Panel Survey (MEPS).
- The primary dependent variable was total healthcare expenditures. The secondary dependent variables were office-based, outpatient, emergency room, inpatient, other, and prescription medication expenditures.
- The independent variable was pain severity, classified as little, moderate, quite a bit, or extreme pain, based on responses to an item about how much pain interfered with normal work outside the home and housework in the past four weeks.
- Expenditures were compared between pain severity levels using adjusted linear regression analysis with logarithmically transformed cost data.
- Analysis were weighted appropriated to account for the complex MEPS design and to obtain nationally representative estimates.
- The a priori alpha value was 0.05 and all analysis were conducted using SAS.

Results

- A weighted sum of 57,116,711 individuals were included from the MEPS dataset within our study.

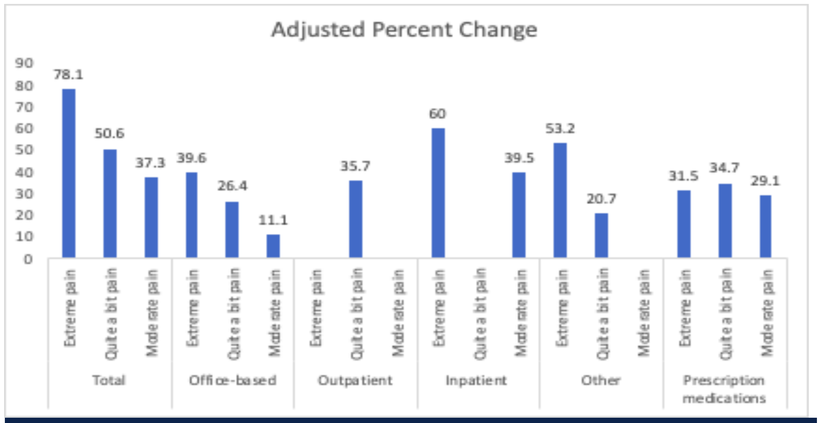
Table 1 results

Characteristics	Little pain (Weighted N=3,908,180)	Moderate pain (Weighted N=10,564,668)	Quite a bit of pain (Weighted N=12,349,501)	Extreme pain (Weighted N= 30,312,362)	
	Weighted N (%)	Weighted N (%)	Weighted N (%)	Weighted N (%)	P
Northeast Region	17.3 (14.7, 19.9)	18.5 (15.9, 21.2)	15.1 (12.6, 17.7)	18.3 (13.3, 23.4)	0.06
Midwest Region	23.1 (20.1, 26.1)	22.1 (18.9, 25.4)	20.5 (16.9, 24.1)	16.9 (11.3, 22.5)	
South Region	36.5 (33.6, 39.3)	37.5 (33.9, 41.1)	44.2 (40.1, 48.4)	41.0 (34.7, 47.3)	
West Region	23.1 (20.4, 25.9)	21.9 (19.0, 24.8)	20.1 (16.6, 23.7)	23.8 (18.7, 28.9)	
Age: 50-64	51.9 (49.2, 54.6)	40.8 (37.1, 44.6)	45.1 (41.5, 48.7)	54.6 (49.0, 60.1)	<0.0001
Female gender	54.2 (52.2, 56.2)	56.0 (52.7, 59.3)	57.2 (53.4, 61.0)	61.9 (56.1, 67.7)	0.09
White race	81.3 (79.2, 83.5)	83.7 (81.1, 86.2)	77.8 (74.3, 81.3)	77.4 (72.0, 82.9)	0.02
Non-Hispanic Ethnicity	91.1 (89.4, 92.8)	90.7 (88.3, 93.1)	90.1 (87.6, 92.6)	87.1 (82.6, 91.6)	0.11
Married	60.8 (58.6, 63.0)	55.1 (51.6, 58.5)	51.3 (47.0, 55.6)	44.7 (38.6, 50.8)	<0.0001
High school education or less	39.4 (36.7, 42.1)	44.2 (40.4, 48.0)	55.9 (52.0, 59.7)	61.4 (55.0, 67.7)	<0.0001
Excellent/very good/good health	86.9 (85.3, 88.5)	72.3 (69.4, 75.2)	50.8 (46.6, 55.0)	32.9 (27.0, 38.9)	<0.0001
Fair/poor health	13.1 (11.5, 14.7)	27.7 (24.8, 30.6)	49.2 (45.0, 53.4)	67.1 (61.1, 73.0)	<0.0001
Excellent/very good/good mental health	92.6 (91.4, 93.9)	84.0 (81.4, 86.5)	74.1 (71.0, 77.3)	67.6 (61.7, 73.5)	<0.0001
Fair/poor mental health	7.4 (6.1, 8.6)	16.0 (13.5, 18.6)	25.9 (22.7, 29.0)	32.4 (26.5, 38.3)	<0.0001
Limitation present	32.8 (30.4, 35.1)	61.1 (57.2, 65.0)	78.0 (74.6, 81.4)	84.7 (79.7, 89.7)	<0.0001
Moderate/vigorous exercise 5x/week	49.3 (46.8, 51.8)	38.4 (34.5, 42.3)	31.0 (27.5, 34.6)	26.4 (21.4, 31.4)	<0.0001
Non-smoker	86.7 (85.3, 88.2)	83.2 (80.4, 86.0)	79.0 (76.0, 82.0)	78.3 (74.0, 82.7)	<0.0001
Employed	52.5 (49.6, 55.3)	31.5 (27.8, 35.2)	22.5 (18.6, 26.4)	14.9 (9.7, 20.2)	<0.0001
Poor/near poor/low income	23.2 (21.4, 25.1)	32.5 (29.3, 35.8)	41.9 (37.5, 46.2)	56.7 (50.3, 63.1)	<0.0001
Middle/high income	76.8 (74.9, 78.6)	67.5 (64.2, 70.7)	58.1 (53.8, 62.5)	43.3 (36.9, 49.7)	<0.0001
Private health insurance	67.0 (63.7, 70.2)	52.9 (49.1, 56.7)	44.4 (40.4, 48.3)	35.4 (29.3, 41.6)	<0.0001
Public health insurance	30.0 (26.9, 33.1)	43.6 (39.6, 47.5)	53.1 (49.2, 57.0)	62.3 (56.3, 68.3)	<0.0001
Uninsured	3.1 (2.4, 3.7)	3.6 (1.6, 5.5)	2.5 (1.4, 3.7)	2.3 (0.7, 3.8)	<0.0001
≥5 Chronic conditions	15.6 (13.9, 17.2)	30.0 (26.2, 33.9)	35.5 (31.4, 39.6)	42.2 (37.0, 47.4)	<0.0001
0-4 Chronic conditions	84.4 (82.8, 86.1)	70.0 (66.1, 73.8)	64.5 (60.4, 68.6)	57.8 (52.6, 63.0)	<0.0001

Discussion

- Researchers noted that a pattern emerged for the correlation of pain severity and adjusted healthcare expenditures for total, office-based, and prescription medication expenditures. Although this pattern showed similarities to similar studies, it was not consistent for outpatient, inpatient, other expenditures, and emergency room expenditures.

Figure 1 results



Limitations

- Limitations of this study included the retrospective nature of the study design; this prohibits the determination of a cause-and-effect relationship between pain severity and healthcare expenditures and the use of self-reported pain in the past four weeks.

Future Work

- Future research is needed to understand why some types of healthcare expenditures are positively correlated with greater pain severity levels, yet others are not, and should evaluate clinical or public health interventions to reduce and prevent pain.

Conclusion

- Findings of the study suggest the need for interventions to help reduce pain severity, or prevent pain from becoming severe in the first place, which in turn may help to reduce healthcare expenditures
- These findings suggest that reducing pain severity, or preventing pain from becoming severe, could improve healthcare expenditures. Future research is needed to understand why some types of healthcare expenditures are positively correlated with greater pain severity levels, yet others are not, and should evaluate clinical or public health interventions to reduce and prevent pain.

References

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