Continuity of Care and Multiple Chronic Conditions Impact Frequent use of outpatient services

Chi Wang, Su-Fen Cheng, Jui-Lan Hung, Jin-Shiung Cheng, Pei-Ling Tang

Introduction

We wondered whether interventions along the line of promoting continuity of care would get us closer to rational use of medical services. To investigate the relationships between care continuity and chronic conditions, how it impacted the number of outpatient visits, and risk factors of highly frequent uses. We aimed to find constructive suggestions that could help bring efficient, high-quality care for multiple chronic conditions (MCC) patients.

Methods

The national health insurance (NHI) database was used and 333,294 patients were identified from 2007 to 2009. The continuity of care index (COCI) indicates the dispersion of a patient's ambulatory visits among providers. Patients who were not continuously enrolled in the NHI program or had no internal medicine outpatient visit or less than 4 outpatient visits of the continuity of care index (COCI) were excluded. Multivariate logistic regression was used to estimate adjusted odds ratios with 95% confidence intervals.

Results

There were 15.76 % subjects in the high level COCI groups, respectively. COCI was not only significantly correlated with CCI scores, but also with individual comorbidities. Patients aged 65 and above, males, those who lived in rural areas, those who had a low income, and those who had ED visits, those who were hospitalized and those with psychiatric disorders in the COCI period, and those who had severe comorbidities were more likely to use outpatient care highly frequently.

Conclusions

The patients with poor continuity of care were likely to visit the outpatient department highly frequently, and that a combination of age, sex, socioeconomic status, psychological disorders, chronic conditions and care continuity could reliably predict the risk of highly-frequent use of medical resources.

Table Multivariable analysis of the risk of high medical utilization in outpatients care associated with each variable.

Variables	Risk of high medical utilization (≥ 51 visits)					
	Model 1			Model 2		
	Adjusted OR	95%CI	*p*-value	Adjusted OR	95%CI	*p*-value
Level of COCI (%)						
Low level (< 0.36)	2.38	(2.12, 2.68)	< .0001	2.24	(1.99, 2.52)	< .0001
Moderate level (0.36 - 0.99)	1.96	(1.74, 2.21)	< .0001	1.93	(1.72, 2.17)	< .0001
High level (1)	1.00	(reference)		1.00	(reference)	
Age group						
< 18 years	1.00	(reference)		1.00	(reference)	
18 - 44 years	2.71	(2.19, 3.35)	< .0001	2.78	(2.24, 3.44)	< .0001
45 - 64 years	5.99	(4.88, 7.34)	< .0001	6.15	(5.02, 7.54)	< .0001
≥ 65 years	11.11	(9.08, 13.59)	< .0001	11.71	(9.58, 14.32)	< .0001
Sex						
Male	1.22	(1.16, 1.28)	< .0001	1.21	(1.15, 1.28)	< .0001
Female	1.00	(reference)		1.00	(reference)	
Urban level						
Urban	1.00	(reference)		1.00	(reference)	
Suburban	1.13	(1.05, 1.20)	0.0004	1.11	(1.04, 1.19)	0.0012
Rural	1.37	(1.28, 1.47)	< .0001	1.35	(1.26, 1.45)	< .0001
Socioeconomic status						
Low income	1.94	(1.76, 2.13)	< .0001	1.94	(1.76, 2.13)	< .0001
Median income	1.90	(1.73, 2.10)	< .0001	1.88	(1.71, 2.08)	< .0001
High income	1.00	(reference)		1.00	(reference)	
ED visits in the past year	1.35	(1.28, 1.44)	< .0001	1.34	(1.26, 1.42)	< .0001
Hospitalization in the past year	1.44	(1.36, 1.53)	< .0001	1.41	(1.33, 1.50)	< .0001
Psychiatric disorders in the past year	2.32	(2.20, 2.44)	< .0001	2.44	(2.32, 2.57)	< .0001
Catastrophic illness card in the past	1.05	(0.97, 1.14)	0.2531	1.21	(1.09, 1.34)	0.0005
CCI scores						
None (0 score)	1.00	(reference)		—		
Moderate (1 score)	1.79	(1.68, 1.90)	< .0001	—		
Severe (≧ 2 scores)	3.03	(2.84, 3.23)	< .0001	—		
Comorbidity						
MI		—		1.32	(1.05, 1.66)	0.0175
CHF		—		1.32	(1.17, 1.49)	< .0001
PVD		—		1.81	(1.46, 2.24)	< .0001
CVD		—		1.19	(1.10, 1.29)	< .0001
Dementia		—		0.64	(0.54, 0.75)	< .0001
COPD		—		2.11	(1.97, 2.25)	< .0001
RD		—		1.88	(1.55, 2.28)	< .0001
PUD		—		1.90	(1.78, 2.03)	< .0001
LD		—		1.52	(1.38, 1.67)	< .0001
DM		—		1.81	(1.71, 1.92)	< .0001
Hemiplegia		—		0.83	(0.60, 1.14)	0.2512
Renal disease		—		1.97	(1.76, 2.20)	< .0001
Cancer		—		1.21	(1.06, 1.38)	0.0059

OR, odds ratio; CI, confidence interval; ED, emergency department; COCI, continuity of care index; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; RD, rheumatologic disease; CVD, cerebral vascular disease; DM, diabetes mellitus; LD, liver disease; MI, myocardial infarction; PUD, peptic ulcer disease; PVD, peripheral vascular disease.

Key word: continuity of care, chronic conditions, cohort study, frequent users of outpatient

Correspondence to: Chi Wang
E-mail address: wchi@vghks.gov.tw

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