

Health Literacy in a Consumer Driven Health Plan

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Objective

To examine the association between adequate health literacy and healthcare spending and utilization among new enrollees in a consumer-driven health plan

Study Design

- Cross-sectional retrospective study
- Convenience sample
 - Two employers

Data Sources

- Three item health literacy screening tool (Chew, et al) via secure CDHP website
- Medical and pharmacy claims

Participants

- New enrollee to CDHP Jan 1, 2006
Continuously enrolled for 12 months
of 2006
- Registered on secure CDHP web site
Completed survey on-line
- Adults (age 18 – 65)

Participants

<u>Member Characteristics (N=4,130)</u>	<u>%</u>
Female	49.9%
Age Groups	
18 to 25	6.3%
26 to 35	19.3%
36 to 45	30.3%
46 to 55	29.8%
56 to 65	14.4%
Employer A (1 of 2 employers)	35.5%
Subscribers (Subscriber/Member)	87.8%
Region	
Northeast	9.4%
Midwest	29.0%
South	19.5%
West	42.1%

Participants

Member Characteristics (N=4,130)

Risk Score

Mean	119.2
SD	204.6

Participants

Member Characteristics (N=4,130)

%

Chronic Conditions

Anxiety	1.5
Osteoarthritis	4.7
Bipolar	0.3
Asthma	2.3
CHF	0.2
COPD	0.6
CAD	1.8
Diabetes	5.5
Hypertension	12.9
Low Back Pain	9.3
Depression	3.2
HIV	0.1

Methods

Poisson log-linked regressions

- Independent Variables
 - Each health literacy item individually (1,2 and 3)
 - Health literacy score (sum of 3 items)
 - Individual items were categorized to binomial
- Dependent Variables
 - Each of 7 Spending variables (28 regressions)
 - Each of 6 Utilization variables (24 regressions)
- Covariates
 - Age, Gender, Employer, Region of residence

Methods

Spending parameters

(Dependent Variables)

- Total
- Medical
- Pharmacy
- Medical and Pharmacy
- Admissions
- Admissions to a Facility
- Emergency Department

Methods

Utilization parameters

(Dependent Variables)

- Admissions
- Days Admitted
- Prescriptions
- Days Supply
- Number of Visits
- Emergency Department Visits

Methods

Logistic regression

- Independent Variables
 - Health literacy scored (sum)
 - Each health literacy item individually (1,2 and 3)
- Dependent Variables
 - At least one visit (y/n) (1 regression)
 - Cholesterol screen (y/n) (1 logistic regression)
- Covariates
 - Age, Gender, Employer, Region of residence

Health Literacy Measures

Item #1

How often do you have someone help you read medical materials?

0 Always	0.0 %
1 Often	2.9 %
2 Sometimes	10.4 %
3 Occasionally	32.7 %
4 Never	54.0 %
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N	4,130

Health Literacy Measures

Item #2

How often do you need help filling out medical forms?

0 Always	0.0 %
1 Often	0.9 %
2 Sometimes	7.1 %
3 Occasionally	27.8 %
4 Never	64.3 %
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N	4,130

Health Literacy Measures

Item #3

How often do you have problems learning about your medical conditions because of difficulty understanding written information?

0 Always	0.0 %
1 Often	1.1 %
2 Sometimes	7.8 %
3 Occasionally	28.6 %
4 Never	62.5 %
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N	4,130

Health Literacy Measures

Health Literacy Score
(Sum of three health literacy items)

Mean	10.5
SD	1.7
Range	1-12
N	4,130

Health Care Spending
Health Literacy Score
 Sum of 3 health literacy items

	Coeff	SE	p-value	Mean	SD
Total	-0.05	0.01	< 0.0001	\$3,735.22	8,269.72
Medical	-0.03	0.02	0.032	\$3,054.95	11,535.20
Pharmacy	-0.02	0.01	> 0.05	\$883.98	1,947.42
Medical & Pharmacy	-0.03	0.01	0.033	\$3,983.93	12,301.31
Admissions	-0.04	0.02	0.007	\$701.61	6,087.35
Admissions Facility	-0.04	0.02	> 0.05	\$550.69	5,331.93
Emergency Department	-0.17	0.02	< 0.0001	\$35.70	212.77

Poisson Regression (log-linked)
 N = 4,130 members
 Co-variates: age, gender, risk score & region

Health Care Spending

Item # 1

How often do you have someone help you read medical materials?

	Coeff	SE	p-value	Mean	SD
Total	-0.20	0.06	0.001	\$3,735.22	\$8,269.72
Medical	-0.12	0.07	> 0.05	\$3,054.95	\$11,535.20
Pharmacy	-0.15	0.06	0.0178	\$883.98	\$1,947.42
Medical & Pharmacy	-0.13	0.07	> 0.05	\$3,983.93	\$12,301.31
Admissions	-0.10	0.12	> 0.05	\$701.61	6,087.35
Admissions Facility	-0.13	0.12	> 0.05	\$550.69	5,331.93
Emergency Department	-0.52	0.09	0.0001	\$35.70	\$212.77

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Health Care Spending

Item #2

How often do you need help filling out medical forms?

	Coeff	SE	p-value	Mean	SD
Total	-0.24	0.07	0.001	\$3,735.22	\$8,269.72
Medical	-0.21	0.09	0.022	\$3,054.95	\$11,535.20
Pharmacy	-0.07	0.08	> 0.05	\$883.98	\$1,947.42
Medical & Pharmacy	-0.18	0.08	0.030	\$3,983.93	\$12,301.31
Admissions	-0.15	0.15	> 0.05	\$701.61	6,087.35
Admissions Facility	-0.18	0.15	> 0.05	\$550.69	5,331.93
Emergency Department	-0.33	0.12	0.008	\$35.70	\$212.77

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Health Care Spending Item #3

How often do you have problems learning about your medical conditions because of difficulty understanding written information?

	Coeff	SE	p-value	Mean	SD
Total	-0.27	0.07	< 0.0001	\$3,735.22	\$8,269.72
Medical	-0.28	0.08	0.001	\$3,054.95	\$11,535.20
Pharmacy	0.03	0.08	> 0.05	\$883.98	\$1,947.42
Medical & Pharmacy	-0.21	0.08	0.004	\$3,983.93	\$12,301.31
Admissions	-0.42	0.13	0.001	\$701.61	6,087.35
Admissions Facility	-0.38	0.13	0.0035	\$550.69	5,331.93
Emergency Department	-1.06	0.09	< 0.0001	\$35.70	\$212.77

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Health Care Utilization
Health Literacy Score
 Sum of 3 health literacy items

	Coeff	SE	p-value	Mean	SD
Admissions	-0.08	0.02	0.001	0.049	0.26
Days Admitted	-0.07	0.02	0.003	0.15	1.11
Prescriptions	-0.01	0.01	> 0.05	9.81	13.43
Days Supply	-0.01	0.01	> 0.05	434.46	659.70
Visits	-0.01	0.01	> 0.05	13.12	14.11
Emer. Dept Visits	-0.09	0.02	< 0.0001	0.11	0.43
Logistics regression:					
At least one visit	0.03	0.05	> 0.05	90.9 %	
Cholesterol Screens	0.03	0.02	> 0.05	42.4 %	

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Health Care Utilization

Item # 1

How often do you have someone help you read medical materials?

	Coeff	SE	p-value	Mean	SD
Admissions	-0.02	0.01	> 0.05	0.049	0.26
Days Admitted	-0.03	0.05	> 0.05	0.15	1.11
Prescriptions	-1.09	0.59	> 0.05	9.81	13.43
Days Supply	-55.96	28.48	0.049	434.46	659.70
Visits	-0.72	0.61	> 0.05	13.12	14.11
Emer. Dept Visits	-0.04	0.02	> 0.05	0.11	0.43
Logistics regression:					
At least one visit	0.08	0.23	> 0.05	90.9 %	
Cholesterol Screens	0.02	0.10	> 0.05	42.4 %	

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Health Care Utilization

Item #2

How often do you need help filling out medical forms?

	Coeff	SE	p-value	Mean	SD
Admissions	-0.02	0.02	> 0.05	0.049	0.26
Days Admitted	-0.04	0.06	> 0.05	0.15	1.11
Prescriptions	-0.49	0.74	> 0.05	9.81	13.43
Days Supply	-25.31	35.79	> 0.05	434.46	659.70
Visits	-0.63	0.77	> 0.05	13.12	14.11
Emer. Dept Visits	-0.02	0.03	> 0.05	0.11	0.43
Logistics regression:					
At least one visit	0.39	0.28	> 0.05	90.9 %	
Cholesterol Screens	0.14	0.13	> 0.05	42.4 %	

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Health Care Utilization

Item #3

How often do you have problems learning about your medical conditions because of difficulty understanding written information?

	Coeff	SE	p-value	Mean	SD
Admissions	-0.04	0.01	0.010	0.049	0.26
Days Admitted	-0.12	0.06	0.049	0.15	1.11
Prescriptions	-0.10	0.70	> 0.05	9.81	13.43
Days Supply	41.14	34.01	> 0.05	434.46	659.70
Visits	-0.37	0.73	> 0.05	13.12	14.11
Emer. Dept Visits	-0.11	0.02	< 0.0001	0.11	0.43
Logistics regression					
At least one visit	0.02	0.22	> 0.05	90.9 %	
Cholesterol Screens	0.22	0.12	> 0.05	42.4 %	

Poisson Regression (log-linked)

N = 4,130 members

Co-variates: age, gender, risk score & region

Conclusions

Adequate health literacy is associated with reduced health care spending among members of a commercial CDHP health care plan.

Implications

- Employers and insurers should be alerted to the influence of health literacy on health care costs and utilization for enrollees within CDHP
- Consider health literacy interventions for those in these plans