

# Complex patients: what is associated with frequent use of healthcare services?

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## BACKGROUND

- Most expert panels recognize that complexity reflects an interaction of multiple factors that span biological, socioeconomic, cultural, environmental, and behavioral affects.<sup>1</sup> From the healthcare provider's perspective, medical, social, and behavioral factors actually all contribute to complexity and have impacts on providers and healthcare systems.<sup>2</sup>
- To meet the challenge of caring for many complex patients, case management programs are seen as an effective approach to improve satisfaction and quality of life and reduce health services use and cost. Implementation of interventions to better integrate healthcare services offered to complex patients has to be based on a good understanding of their vulnerability factors<sup>3</sup>.

## OBJECTIVES

- To describe the characteristics of complex patients with chronic diseases (CD) referred to a pragmatic intervention of case management by a primary care (PC) nurse and to examine which characteristics are associated with frequent healthcare use.

## METHODS

- This study<sup>4</sup> used data collected from patients referred to a case management intervention by a PC nurse.
- Patients were identified by a mixed case finding method in which involved family physicians received a list of their most frequent users of hospital services ( $\geq 3$  ER visits and/or hospitalizations in the previous year). They then identified the patients they believed would benefit most from the intervention. They also targeted additional patients they considered complex even though they were not on the list using the same criteria.
- Targeted patients were:
  - aged between 18 and 85 years;
  - with at least one CD (diabetes, CVD, respiratory diseases, musculoskeletal diseases and/or chronic pain); and
  - followed in one of the four family medicine groups (FMG) participating in the study<sup>5</sup>.
- Self-reported characteristics (n = 316) measured during an encounter with a research agent were:
  - Sociodemographic data
  - Multimorbidity (Disease Burden Morbidity Assessment – DBMA)<sup>6</sup>
  - Health literacy (Newest Vital Sign – NVS)<sup>7</sup>
  - Patient activation (Patient Activation Measure – PAM)<sup>8</sup>
  - Mental health (Hospital Anxiety and Depression Scale - HADS)<sup>9</sup>
  - Quality of life (SF-12v2)<sup>10</sup>
  - Self-efficacy (Self-efficacy for Managing Chronic Disease Scale – SEMCD)<sup>11</sup>.
- Healthcare use in the previous year was obtained using MAGIC Chronique software by MediaMed technologies<sup>12</sup>.
- The variables with a significant association with healthcare use were used as potential predictors in the multivariate logistic regression model.

## RESULTS

**Table 1. Characteristics of the sample (n=316)**

Characteristic	ER visits and/or hospitalizations		p value
	< 3 (n = 127)	$\geq 3$ (n = 189)	
Mean (SD) age, years	60.3 (12.3)	60.3 (13.5)	NS
Male, %	37.8	43.4	NS
Annual family income (CAN\$), %			0.03
<\$20,000	24.4	30.3	
\$20,000-\$49,999	40.1	45.9	
$\geq$ \$50,000	35.4	23.8	
DBMA, Mean (SD)	14.5 (10.7)	13.0 (8.1)	NS
NVS < 4, %	67.7	68.6	NS
$\geq 4$ , %	32.3	31.4	
PAM, Mean (SD)	67.8 (16.5)	60.5 (14.7)	<0.001
Level 1 <sup>a</sup> , %	9.5	16.4	
Level 2, %	13.5	20.1	
Level 3, %	27.0	36.0	
Level 4, %	50.0	27.5	
HADS < 16	65.1	66.7	NS
$\geq 16$	34.9	33.3	
SF-12v2 Physical summary, Mean (SD)	36.7 (12.4)	37.9 (11.3)	NS
Mental summary, Mean (SD)	45.1 (11.7)	44.8 (12.0)	NS
SEMCD, Mean (SD)	6.4 (2.1)	6.5 (1.9)	NS

<sup>a</sup>Level 1: low patient activation – Level 4: high patient activation

**Table 2. Results of bivariate analyses**

Variable	ER visits and/or hospitalizations	
	$\beta$ †	p value
Age	0.000	0.96
Sex	0.232	0.32
Income	-0.077	0.03*
Multimorbidity (DBMA)	-0.017	0.16
Literacy (NVS)	-0.043	0.86
Activation (PAM)	-0.03	<0.001*
Depression and/or anxiety	0.010	0.50
Quality of life (SF-12v2)		
Physical component summary	0.009	0.36
Mental component summary	-0.002	0.82
Self-efficacy (SEMCD)	0.014	0.81

†  $\beta$  = regression coefficient

\* p < 0.05

**Table 3. Results of multivariate logistic regression**

Variable	ER visits and/or hospitalizations		Exp ( $\beta$ )	95% CI for Exp ( $\beta$ )	
	$\beta$ †	p value		Lower	Upper
Age	-0.003	0.77	0.997	0.979	1.016
Sex	0.222	0.37	1.249	0.770	2.024
Income	-0.064	0.10	0.938	0.869	1.012
Activation (PAM)	-0.026	0.001*	0.975	0.960	0.990
Constant	2.293	0.007	9.903	-	-

†  $\beta$  = regression coefficient

\* p < 0.05

## STRENGTHS AND LIMITS

- The transversal design does not allow us to calculate relative risk. Even if the sample size is relatively small (n = 316), participants were recruited in four family medicine groups regrouping 38 family practitioners.
- Further studies should examine the association between patient activation and healthcare services use, with a random sample, ideally in a prospective design, to confirm the observed association.

## CONCLUSIONS

- Many complex patients presented multimorbidity, compromised health literacy, socioeconomic deprivation and symptoms of anxiety or depression.
- Low activation score seemed associated with more emergency room visits and hospitalizations.
- Primary care professionals who use case management should therefore adopt a holistic approach tailored to patients who present compromised health literacy and significant levels of anxiety and depressive symptoms, while aiming to increase patient activation to reduce use of healthcare services.

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