

Exploratory Analysis of Consultation Patterns Prior to the Diagnosis of Depression

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Abstract. Depression is frequently underdiagnosed or the diagnosis occurs in late stages, mainly because it usually presents as a paucisymptomatic disorder. Electronic health records (EHRs) are a very useful tool to capture the longitudinal medical history of the patient which may help in diagnosing these patients earlier. We aimed to understand how these patients' consultation patterns are represented in the EHR up until depression diagnosis.

Keywords. Depression, Electronic health records, Depressive Symptoms

1. Introduction

Depression is the most frequent psychiatric medical disorder observed in primary care [1]. The main problem that depression presents is the fact that 50% of the cases are not diagnosed [2][3]. Underdiagnosis is very frequent due to the atypical and varied clinical presentation of depression[3]. Usually, looking at the patients' history and consultation pattern facilitates arriving at a diagnosis. EHRs help to collect and review patient data longitudinally. The objective is to describe the consultation patterns of patients before they are diagnosed with depression at Hospital Italiano de Buenos Aires using data from EHRs.

2. Methods

We manually reviewed a random sample of 600 adult patients over 18 that had at least one depression related code registered in their EHR between 2010 and 2016. 278 had a first diagnosis of depression. We obtained several variables related to healthcare system use. Finally, we explored patient clusters using non-supervised algorithms like k-means and hierarchical clustering. A six cluster solution was found to be the best fit. Clusters were then manually inspected and qualitatively described.

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3. Results

Table 1 shows the patients' characteristics and describes each cluster. Although we statistically obtained a 6 cluster solution, we combined them into 4 according to their main characteristics (Cluster 1, clusters 2 + 3, cluster 4, clusters 5 + 6). Cluster 1: We believe these patients already had a diagnosis of depression, due to the fact that they presented a large number of consultations within a short time of affiliation. In clusters 2+3, there were a large number of consultations to specialties, general medicine, emergency room visits and hospital admissions. They present a pattern of consultations compatible with patients who are underdiagnosed and thus keep seeking care. Cluster 4 and 5+6 comprise most of the sample. Patients in these clusters had most of their visits with their general physician, with different follow up times. They most likely represent patients who take advantage of a primary care centered health system.

Table 1. Patients' characteristics and description of clusters

Cluster no.	1	2 + 3		4	5 + 6	
n	6	16	4	53	149	50
Age at diagnosis (median [IQR])	72 [58.75, 76.25]	68.50 [62.2, 80]	64.5 [37, 87.5]	65.00 [54, 72]	67.00 [51, 79]	64.5 [46.5, 74]
Women (%)	6 (100.0)	11 (68.8)	4 (100.0)	48 (90.6)	149 (100.0)	0 (0.0)
Seniority	0.30 [0.26, 0.61]	7.47 [1.90, 14.10]	7.95 [4.90, 10.34]	1.57 [0.75, 2.29]	8.27 [5.85, 12.51]	8.89 [6.50, 14.90]
Emergency room visits	0.00 [0.00, 0.00]	0.89 [0.40, 1.30]	1.50 [0.90, 2.48]	0.00 [0.00, 0.82]	0.22 [0.00, 0.60]	0.60 [0.20, 0.98]
Hospital admission	0.00 [0.00, 0.00]	0.00 [0.00, 0.39]	0.50 [0.39, 0.85]	0.00 [0.00, 0.00]	0.00 [0.00, 0.20]	0.00 [0.00, 0.00]
Follow-up years	0.30 [0.26, 0.61]	5.00 [1.90, 5.00]	5.00 [4.46, 5.00]	1.57 [0.75, 2.29]	5.00 [5.00, 5.00]	5.00 [5.00, 5.00]
No. visits per year	203.15 [145.7, 408.7]	62.10 [47.8, 91.2]	42 [37, 47.7]	38.3 [24.3, 64.2]	13.2 [5.4, 22.4]	6.9 [3.5, 16.7]

4. Conclusions

Longitudinal data in the EHR was useful for differentiating clusters of patients with a recent diagnosis of depression.

References

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