

# BMJ Open

BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email [info.bmjopen@bmj.com](mailto:info.bmjopen@bmj.com)

# BMJ Open

## Association between healthcare professionals' empathy and burnout and the number of annual primary care visits per patient under their care in Spain

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-020949
Article Type:	Research
Date Submitted by the Author:	05-Dec-2017
Complete List of Authors:	Yuguero, Oriol; Institut de Recerca Biomedica de Lleida, Melnick, Edward; Yale University, Marsal, Josep Ramon; Primary Care Research Institute- IDIAP Jordi Gol. Universitat Autònoma of Barcelona, Lleida Research Support Unit; University Hospital Vall d'Hebron., Cardiovascular Department, Epidemiology Unit. Esquerda, Montserrat; Institut Borja de Bioetica Soler-Gonzalez, Jorge; Universitat de Lleida Facultat de Medicina
<b>Primary Subject Heading</b>:	Patient-centred medicine
Secondary Subject Heading:	Communication, Ethics, Health services research
Keywords:	Empathy, Burnout, PRIMARY CARE, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™  
Manuscripts

only

1  
2  
3 Association between healthcare professionals' empathy and burnout and the number  
4 of annual primary care visits per patient under their care in Spain  
5

6 Visits, empathy and burnout.  
7

8 Health Service Research  
9

10  
11 Oriol Yuguero<sup>1,2</sup>, Edward R. Melnick<sup>3</sup> Josep Ramon Marsal<sup>4,5</sup>, Montserrat Esquerda<sup>1,6</sup>,  
12 Jorge Soler-González<sup>1,2</sup>  
13

- 14 1. Faculty of Medicine. University of Lleida. Spain.
- 15 2. Biomedical Research Institute of Lleida. IRBLLEIDA Spain.
- 16 3. Department of Emergency Medicine, Yale School of Medicine, New Haven, CT,  
17 United States
- 18 4. Primary Care Research Institute (IDIAP). Spain.
- 19 5. Epidemiology Unit. Cardiovascular Department. Vall d'Hebron University  
20 Hospital. Barcelona. Spain.
- 21 6. Borja Bioethics Institute. Barcelona. Spain.  
22  
23  
24  
25

26 Corresponding Author:

27 Dr. ORIOL YUGUERO TORRES

28 Avda. Rovira Roure 80, 25198 Lleida

29 [Oriol.yuguero@gmail.com](mailto:Oriol.yuguero@gmail.com)

30 630246134  
31  
32  
33

34 Word Count: 2220 words

35 Tables: 2  
36

37 Authors declare no conflict of interest.  
38

39 English translation of this article was done with the support of the Languages Institute  
40 of the University of Lleida.  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Abstract

### Objective

The aim of this study was to evaluate the association between physician and nurse self-reported empathy and burnout and the number of annual primary care visits per patient under their care.

### Methods

Design: A cross-sectional survey study was conducted from January 2013 to June 2014

Site: The 22 Primary Care Centres of the Lleida Health Region in Spain.

Main Outcome Measures: The Jefferson Scale of Physician Empathy and Maslach Burnout Inventory were used to measure empathy and burnout, respectively. The number of visits and the number of diagnoses coded per visit were obtained through the Region's electronic health record.

### Results

267 healthcare professionals (physicians and nurses, 52.6% participation of the total in the Region) with a total of 301,657 patients under their care. Healthcare professionals' degree of burnout and empathy were associated with the number of annual visits per patient under their care. Burned out nurses and physicians received fewer visits (4.5 vs 3.7) and (18.1 vs 18.9). Whereas, more empathic physicians received more visits per patient (19.4 vs 17.2,  $p < 0.05$ ) and documented more diagnoses per visit (10.2 vs 9.7,  $p = 0.001$ ). Less burned out and less empathic nurses documented more diagnoses per visit (10.2 vs 10.0 and 8.2 vs 9.9,  $p < 0.05$ ).

### Conclusions

Empathy and burnout are associated with the number of annual primary care visits per patient healthcare professionals receive. These results should serve to promote empathic skills and establish organizational changes that promote practice efficiency and, in turn, reduce the degree of burnout of healthcare professionals.

Keywords: Empathy; Burnout; Primary Care; Management

### Strengths and Limitations

One of the first studies showing the association between empathy, burnout and the number of visits in primary care

Sample size based on data of more of 300.000 patients

Use of self responded tests to evaluate empathy and burnout.

### Background

The primary care landscape has undergone major changes in recent years.<sup>i</sup> Administrative burdens<sup>ii</sup>, volume of visits, and insufficient resources in times of cutbacks<sup>iii</sup> are increasing work-related distress and burnout in healthcare professionals. Burnout is a syndrome characterized emotional exhaustion, decreased fulfilment, and the depersonalization.<sup>iv</sup> Burnout impacts healthcare professionals professional and personal lives leading to physicians reducing clinical work hours or clinical practice altogether<sup>v</sup>, thus representing ethical challenges for those responsible for health institutions.<sup>vi</sup> Moreover, burnout has an important impact on quality of care.<sup>vii, viii</sup> Continuing to deliver high quality primary care with high quality relationships with patients requires time.<sup>6</sup> Time constraints can lead to exhaustion and frustration, key elements of burnout.

Front line physicians with direct patient contact such as those practicing primary care, emergency medicine, and internal medicine have some of the highest rates of burnout.<sup>ix, x</sup> In the United States in 2014, 55% of physicians reported symptoms of burnout<sup>xi</sup>--an absolute increase of 10% from just three years prior.<sup>xii</sup> These findings have prompted individual and system level solutions to combat burnout in healthcare professionals.<sup>3,xiii</sup>

Though some individuals may be more prone to burnout, this syndrome is job-related and situation-specific<sup>xiv</sup>. Reducing levels of burnout in health institutions is possible, thereby making it be an ethical responsibility for institutions to improve professional

1  
2  
3 wellness.<sup>xv</sup> Indeed skills that improve healthcare professionals' empathic capacity have  
4 been shown to be associated with lower levels of burnout.<sup>xvixvixviii</sup> The theory is that  
5  
6 when healthcare professionals understand and communicate patients' situations  
7  
8 better, we feel more fulfilled, and we help to humanize care delivery, both  
9  
10 fundamental elements in the prevention of burnout.<sup>xix</sup> Since the degree of burnout or  
11  
12 professional stress can affect the quality of communication with the patient, this study  
13  
14 is particularly relevant given that healthcare professionals are being subjected to  
15  
16 increasing clinical workloads and greater time constraints.<sup>xx</sup> Physician stress and  
17  
18 burnout are two of the factors that most influence the duration of a primary care  
19  
20 visit.<sup>xxi</sup>

21  
22 Clinical empathy has been described as the ability to understand others' feelings and  
23  
24 thoughts and to communicate such understanding.<sup>xxii</sup> Clinical empathy has been shown  
25  
26 to be associated with improved communication, patient satisfaction, and therapeutic  
27  
28 compliance.<sup>xxiii, xxiv</sup> Empathic physicians decrease patient anxiety, potentially leading  
29  
30 better clinical outcomes.<sup>xxv, xxvi</sup>

31  
32 The number of primary care visits per patient is used by the Organization for Economic  
33  
34 Co-operation and Development (OECD)<sup>xxvii</sup> as one of the measures of health system  
35  
36 quality. In 2014, the average number of annual primary care visits per patient in Spain  
37  
38 was 7.6 per year per person, above the European average of 7.1 and far greater than  
39  
40 the 2.9 annual visits in Sweden.

41  
42 The aim of the present study is to evaluate the association between physician and  
43  
44 nurse self-reported measures of empathy and burnout and the number of annual  
45  
46 primary care visits per patient under their care.

## 47 48 49 **Methods**

### 50 51 52 **Participants and Study Design**

53  
54 A cross-sectional survey study was conducted with volunteer participants. In the Lleida  
55  
56 health region there are 22 primary care centres serving a population of about 366,000

1  
2  
3 people. All physicians and nurses in the region were contacted by e-mail and asked to  
4 complete an anonymous survey that assessed their degree of burnout and empathy.  
5  
6 The study was conducted between January 2013 and June 2014. The survey was  
7  
8 administered between May and July 2014.  
9

## 10 11 Outcomes

### 12 13 Burnout and Empathy Evaluation

14  
15 The degree of burnout was measured using the Spanish version of the Maslach  
16 burnout inventory (MBI), a 22-item scale validated in Spanish.<sup>xxviii</sup>,<sup>xxix</sup> This scale  
17  
18 measures the three dimensions of burnout: depersonalization, personal fulfilment, and  
19  
20 emotional exhaustion.<sup>xxx</sup> Empathy was measured using the Spanish version of the  
21  
22 Jefferson Scale of Physician Empathy (JSPE)<sup>xxxi</sup>, a validated scale, recognized as the gold  
23  
24 standard for measuring medical empathy, consisting of 20 items.<sup>xxxii</sup> Both scales are  
25  
26 scored using a 7-point Likert scale, with higher scores indicating higher burnout and  
27  
28 greater empathy.  
29

### 30 31 Annual visits per patient

32  
33 We analysed the number of visits made by patients to their primary care team (nurse  
34  
35 and family physician) between January 2013 and June 2014 (the year in which we  
36  
37 collected data from healthcare professionals). Results were divided by 1.4 to obtain  
38  
39 the number of visits per calendar year. The number of visits, age and gender of each  
40  
41 patient were obtained from the records of the E-CAP electronic health record that is  
42  
43 used by all the primary care professionals of the Catalan Health Institute. It is  
44  
45 important to note that the number of visits by each patient is different from the  
46  
47 volume of visits that a healthcare professional was responsible for during that year.  
48  
49 Given the varying roles and responsibilities of physicians and nurses within a single  
50  
51 care team, we calculated separate values for this outcome for physicians and nurses.

### 52 53 Number of diagnoses coded per visit

54  
55 We collected the number of diagnoses that the healthcare professional participants  
56  
57 documented for each visit. The number and type of diagnoses were used to classify the  
58  
59 severity and complexity of the visit. The diagnoses included in our analysis were

1  
2  
3 diabetes, heart failure, ischemic heart disease, stroke, dyslipidaemia, hypertension,  
4 anemia, joint fibrillation, chronic renal failure, apnea, anxiety, depression, metabolic  
5 syndrome.  
6  
7

#### 8 9 Participant Characteristics

10 The following sociodemographic data were collected for the practitioners: age, gender,  
11 professional category (physician or nurse) and practice setting (urban or rural).  
12  
13  
14  
15

#### 16 Data Analysis

17 Standard descriptive summary statistics were used to characterize the MBI and the  
18 JSPE scores. The reliability of the instruments was tested using Cronbach's  $\alpha$ .  
19 The Chi-square and Kolmogorov-Smirnov tests were used to evaluate the distribution  
20 of these scores. To analyse the association between the sociodemographic variables  
21 and the results of the JSPE, the MBI and the number of visits, the results were grouped  
22 into three categories (low, medium and high) using previously described value ranges  
23 and categories.<sup>12</sup> All results were to be presented with a 95% confidence interval.  
24 Results of association were compared using the Chi-square test. The results were  
25 disaggregated according to age, gender, professional category, and practice setting.  
26 For the data analysis, means, percentages and standard deviations were calculated  
27 using SPSS version 15.0 (IBM 2006)  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38

#### 39 Ethical and confidentiality considerations

40 The study was approved by the Clinical Research Ethics Committee of the Jordi Gol  
41 Institute for Primary Care Research (IDIAP). The data were kept confidential and  
42 anonymous in accordance with the Spanish Data Protection Law 15/1999.  
43  
44

45 All data were coded and accessible only to the primary care information system  
46 technicians who cross-referenced the data. All data were de-identified before being  
47 made available to the investigators.  
48  
49  
50  
51

#### 52 **Results**

53  
54  
55  
56  
57  
58  
59  
60



1  
2  
3 Of the total 267 healthcare professionals who participated in the study (response rate  
4 of 52.6% of practitioners in the region), 131 (49%) were nurses, 136 (51%) were  
5 physicians, 209 (78.3%) were women, and 155 (58.4%) work in rural areas. This sample  
6 was representative of the whole population of healthcare practitioners in the region  
7 according to the Ministry of Health of Catalunya. No significant differences were  
8 detected between burnout and gender or professional role. Medical professionals  
9 practicing in rural areas reported a lower degree of empathy ( $p < 0.05$ ) but no  
10 significant differences in burnout. Cronbach's  $\alpha$ , was 0.733 for the MBI and 0.748 for  
11 the JSPE, what shows an adequate reliability of the scales used.  
12  
13  
14  
15  
16  
17  
18  
19

#### 20 Annual visits per patient

21 We analysed the annual number of visits per patient among 301,657 patients under  
22 the care of the participating 267 healthcare professionals. Nurses with higher burnout  
23 received fewer annual visits per patient. (4.5 visits vs 3.7 in the most burned out,  
24  $p=0.001$ , Table 1). There was not a significant difference in the number of annual visits  
25 per patient based on nurses' degree of empathy. The most burned out physicians  
26 received fewer annual visits per patient (18.1 vs 18.9,  $p=0.002$ , Table 2). Physicians  
27 with lower empathy received a higher number of visits by their patients (19.4 vs 17.2,  
28  $p=0.001$ ).  
29  
30  
31  
32  
33  
34  
35  
36

#### 37 Number of diagnoses coded per visit

38 Less burned out nurses (8.4 vs 9.9,  $p < 0.05$ ) and less empathic nurses (10 vs 10.2,  $p$   
39  $< 0.05$ ) documented more diagnoses per visit. Whereas physicians with medium range  
40 empathy documented the most diagnoses (10.2 vs 9.7,  $p=0.001$ ). In addition,  
41 physicians with the highest degree of burnout were the ones that documented the  
42 most diagnoses per visit (10.2 vs 10,  $p < 0.05$ ).  
43  
44  
45  
46  
47  
48

## 49 Discussion

50  
51  
52 In this cross-sectional survey study, we found a significant association between  
53 primary care healthcare professionals' burnout and empathy and the annual number  
54 of visits per patient under their care. This large, highly representative sample is the  
55  
56  
57  
58  
59  
60

1  
2  
3 first (to our knowledge) to analyze this association and is strengthened by the inclusion  
4 of both physicians and nurses. Few existing similar studies make it difficult to compare  
5 our results to the existing literature.  
6  
7

8  
9 The healthcare professionals' degree of burnout and level of empathy were associated  
10 with the annual number of visits per patient under their care. The most empathic and  
11 least burned out physicians received fewer visits. We hypothesize that this relationship  
12 could be due to the fact that these physicians can better solve their patients' problems  
13 with fewer visits. We were unable to compare these results with other similar ones,  
14 since to date the literature<sup>10</sup> has only related the severity of consultation with the  
15 duration of the consultation, not with the number of encounters between physician  
16 and patient.  
17  
18  
19  
20  
21  
22  
23

24  
25 However among nurses, the associations we found were different. Nurses with less  
26 burnout received a greater number of consultations. We should consider that tasks  
27 performed by nurses were generally associated with cures, health promotion, and case  
28 management<sup>xxxiii</sup>. We hypothesize that the nature of nurses' roles and responsibilities  
29 within the care team could influence this relationship, i.e., patients may perceive that  
30 they can consult the nurse more in a single visit without finding resistance. If so, less  
31 burned out nurses may not have mind receiving more visits by the same patient, to  
32 follow up and monitor the evolution of the patient's problems<sup>xxxiv, xxxv</sup>. Also in the field  
33 of nursing, we suspect this greater autonomy of visits and case management may be  
34 related to greater professional satisfaction<sup>xxxvi</sup>. Likewise, the professional situation also  
35 has an association in the documentation of the patients' diagnoses.  
36  
37  
38  
39  
40  
41  
42  
43  
44

45  
46 In reference to the number of diagnoses coded per visit, we believe that the results we  
47 have obtained reflect an association with the professional situation. As for empathy,  
48 both less empathic nursing staff and physicians document more diagnoses per visit.  
49 We hypothesize that professionals with better communication (and empathy) skills  
50 spend more time with the patient and less time documenting diagnoses. It should be  
51 noted that the recording of diagnoses in the computer program is important for two  
52 main reasons. On one hand, these diagnoses can serve as a rapid reference for other  
53  
54  
55  
56  
57

1  
2  
3 healthcare professionals caring for the same patient. On the other hand, the patient's  
4 clinical complexity is determined by the coded diagnoses, so qualifying for certain  
5 clinical programs (i.e inclusion in domiciliary health programs or palliative care) may  
6 depend on correct coding. For these reasons, we believe that healthcare professionals  
7 with medium levels of empathy are the ones that focus on the care of patient in the  
8 interview but also understand the importance of the health records.  
9  
10  
11  
12

13  
14  
15 However it is striking that in the case of physicians, the most burned out physicians are  
16 the ones who record the most. This finding has been described previously, i.e.,<sup>xxxvii</sup> that  
17 burnout healthcare professionals are more likely to dehumanize their patients and,  
18 focus more on the *iPatient* than the actual human being in front of them. Similarly in  
19 Spain, documentation of more diagnoses increases financial incentives linked to  
20 quality indicators<sup>8</sup>.  
21  
22  
23  
24  
25

26  
27 We acknowledge several limitations to our study including the use of self-reported  
28 outcomes which although validated and widely used could lead to a reporting bias.  
29 Furthermore, the 52% of response rate could cause a selection bias. In our region, a  
30 large number of healthcare professionals work in rural areas, where access to family  
31 physicians and nurses (given the great geographical dispersion)<sup>xxxviii</sup> may be more  
32 difficult than in urban areas. In addition, the majority group of healthcare professionals  
33 are those who are over 50 years of age.  
34  
35  
36  
37  
38  
39

40  
41 In conclusion, we believe that future research should focus on which communication  
42 skills and work situations can improve the quality of care. Promotion of such skills  
43 could lead to an improvement not only in the clinical quality of care but also in the  
44 working environment. Burnout levels have been linked with work effort. One of the  
45 most important implications of our study is to quantify the effect of healthcare  
46 professional burnout on patient care.<sup>xxxix</sup> Health policymakers should be aware of the  
47 different measures that can reduce professional burnout (promote professional  
48 engagement, team building, flexible work schedule,..).<sup>xl</sup> Perhaps our findings should  
49 encourage introspection on alignment of financial incentives based on communication  
50 and empathy rather than traditional quality indicators like the number of diagnoses  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 entered in the electronic health record. We believe that the results of our study may  
4 prove interesting for health organization leaders to encourage programs that promote  
5 empathic skills and to establish strategies that reduce the degree of burnout of  
6 healthcare professionals to improve the quality of patient care.  
7  
8  
9

#### 10 11 **Declarations/ Acknowledgements:**

- 12  
13 1. Contributor ship statement: OY designed the study and wrote the main part of  
14 the paper. EM collaborate in the design of the paper and in its revision. JM did  
15 the statistical analysis. ME collaborate in the data collection and in the  
16 introduction research. JS reviewed the manuscript and collaborate in the  
17 revision of all the process.  
18
- 19 2. Competing interests: The authors declare no conflict of interest.  
20
- 21 3. Funding: The authors didn't received funds for this study. English translation of  
22 this article was done with the support of the Languages Institute of the  
23 University of Lleida.  
24
- 25 4. Data sharing statement: All the data is included in the article.  
26  
27  
28  
29  
30  
31  
32  
33  
34

#### 35 **Acknowledgments**

36  
37 To all the primary care professionals in our region whose selfless collaboration allowed  
38 our team to conduct this study.  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57

**Table 1**

Characteristics of patients according to Empathy and Burnout of Nursing staff

EMPATHY	Low (n=52,173)	Medium (n=51,298)	High (n= 49,354)	Total (n=152,825)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women Patients</b>	25,851(49.5%)	25,290 (49.3%)	24,452 (49.5%)	75,593 (49.5%)	0.977
<b>Age</b>	48.1 (19.1)	48.4 (19.2)	48.5 (19.4)	48.3 (19.2)	0.014
<b>Visits 2014</b>	4.5 (6.9)	4.4 (6.6)	4.4 (6.6)	4.5 (6.7)	0.065
<b>Visits 2012</b>	18.9 (23.7)	18.6 (23.2)	18.6 (23)	18.7 (23.3)	0.075
<b>Number of diagnoses</b>	10.2 (8.5)	9.7 (8.3)	10 (8.3)	10 (8.4)	0.001
BURNOUT	Low (n=968,888)	Medium (n=54,441)	High (n=1,496)	Total (n=152,825)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	47638 (49.2%)	27167 (49.9%)	788 (52.7%)	75593 (49.5%)	0.001
<b>Age</b>	48.7 (19.5)	47.6 (18.8)	48.6 (18.8)	48.3 (19.2)	0.001
<b>Visits 2014</b>	4.5 (6.8)	4.3 (6.4)	3.7 (5.3)	4.5 (6.7)	0.001
<b>Visits 2012</b>	19.1 (24)	18.1 (22.1)	16.1 (19.7)	18.7 (23.3)	0.001
<b>Number of diagnoses</b>	9.9 (8.4)	10.2 (8.4)	8.4 (6.7)	10 (8.4)	0.001

Table 2

Characteristics of patients based on Empathy and Burnout of physicians.

EMPATHY	Low (n=42,138)	Medium (n=45,070)	High (n= 61,624)	Total (n=148,832)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	20,793 (49.3 %)	22,246 (49.4%)	30,765 (49.9%)	73,804 (49.6%)	0.052
<b>Age</b>	48.9 (19.3)	48.9 (19.4)	47.9 (19)	48.5 (19.2)	0.001
<b>Visits 2014</b>	4.6 (6.7)	4.5 (6.7)	4.1 (6.3)	4.4 (6.5)	0.001
<b>Visits 2012</b>	19.4 (23.5)	18.9 (23.8)	17.2 (21.7)	18.3 (22.9)	0.001
<b>Number of diagnoses</b>	9.7 (7.8)	10.2 (8.6 )	9.7 (8.3)	9.8 (8.3)	0.001
BURNOUT	Low (n=81,430)	Medium (n=57,742)	High (n=9,660)	Total (n=148,832)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	40,330 (49.5%)	28,798 (49.9%)	4,676 (48.4%)	73,804 (49.6%)	0.589
<b>Age</b>	48.5 (19.1)	48.6 (19.3)	47.9 (18.7)	48.5 (19.2)	0.003
<b>Visits 2014</b>	4.4 (6.5)	4.4 (6.5)	4.5 (6.6)	4.4 (6.5)	0.069
<b>Visits 2012</b>	18.1 (22.8)	18.4 (23.1)	18.9 (22.9)	18.3 (22.9)	0.002
<b>Number of diagnoses</b>	10 (8.5)	9.6 (7.9)	10.2 (8.8)	9.8 (8.3)	0.001

## REFERENCES

- <sup>i</sup> Casado V. Construyendo la atención primaria española en una Europa cambiante. *Aten Primaria* 2016;48:71-2.
- <sup>ii</sup> Shanafelt T, Drybye L, Sinsky C, Hasan O, Satele D, Sloan J, et al. Relationship Between Clerical Burden and Characteristics of the Electronic Environment With Physician Burnout and Professional Satisfaction. *Mayo Clin Proc.* 2016 Jul;91(7):836-48
- <sup>iii</sup> Simó J, Gervás J. Gasto sanitario en atención primaria en España: Insuficiente para ofrecer servicios atractivos para pacientes y profesionales. *Informe SESPAS 2012 Gac Sanit.*, 26 Supl 1 (2012), pp. 36-40
- <sup>iv</sup> Maslach C. *Burnout: The cost of caring.* Englewood Cliffs. N.J. Prentice Hall, 1982
- <sup>v</sup> Olson K. Physician Burnout—A Leading Indicator of Health System Performance? *Mayo Clin Proc.* 2017; 92:1608–1611
- <sup>vi</sup> Shanafelt T, Noseworthy J. Executive Leadership and Physician Well-being: Nine Organizational Strategies to Promote Engagement and Reduce Burnout *Mayo Clin Proc.* 2017;92(1):129-146
- <sup>vii</sup> Dewa C, Loong D, Bonato S, Trojanowski L. The relationship between physician burnout and quality of healthcare in terms of safety and acceptability: a systematic review *BMJ Open* 2017;7:e015141.
- <sup>viii</sup> Yuguero O, Marsal JR, Buti M, Esquerda M, Soler-González J. Descriptive study of association between quality of care and empathy and burnout in primary care. *BMC Med Ethics.* 2017 Sep 26;18(1):54
- <sup>ix</sup> Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med.* 2012;172(18):1377-1385.
- <sup>x</sup> Dyrbye L, Shanafelt T, Sinsky C, Cipriano P, Bhatt J, Ommaya A et al. 2017. Burnout among health care professionals: A call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspectives. Discussion Paper, National Academy of Medicine, Washington, DC.* 2017. Available at [<https://nam.edu/burnout-among-health-care-professionals-a-call-to-explore-and-address-this-underrecognized-threat-to-safe-high-quality-care>].
- <sup>xi</sup> Medscape Lifestyle Report 2016. Available at: <http://www.medscape.com/features/slideshow/lifestyle/2016/public/overview#page=5>
- <sup>xii</sup> Shanafelt T, Hasan O, Dyrbye L, Sinsky C, Satele D, Sloan J, et al. Changes in Burnout and Satisfaction With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014. *Mayo Clin Proc.* 2015;90(12):1600-1613
- <sup>xiii</sup> Burgess DJ, Beach MC, Saha S. Mindfulness practice: A promising approach to reducing the effects of clinician implicit bias on patients. *Patient Educ Couns.* 2016 Sep 15. pii: S0738-3991(16)30415-3. doi: 10.1016/j.pec.2016.09.005

- <sup>xiv</sup> Melnick E, Powsner S, Shanafelt T. In Reply—Defining Physician Burnout, and Differentiating Between Burnout and Depression. *Mayo Clin Proc.* 2017; 92: 1456-1458
- <sup>xv</sup> Shanafelt T, Goh J, Sinsky C. The Business Case for Investing in Physician Well-being. *JAMA Intern Med.* doi:10.1001/jamainternmed.2017.4340
- <sup>xvi</sup> Yuguero O, Forné C, Esquerda M, Pifarré J, Abadías MJ, Viñas J. Empathy and burnout of emergency professionals of a health region: A cross-sectional study. *Medicine (Baltimore).* 2017 Sep;96(37):e8030
- <sup>xvii</sup> Gleichgerrcht E, Decety J (2013) Empathy in Clinical Practice: How Individual Dispositions, Gender, and Experience Moderate Empathic Concern, Burnout, and Emotional Distress in Physicians. *PLoS ONE* 8(4): e61526. doi:10.1371/journal.pone.0061526
- <sup>xviii</sup> Yuguero O, Marsal JR, Esquerda M, Soler-González J. Association between low empathy and high burnout among primary care physicians and nurses in Lleida, Spain. *Eur J Gen Pract.* 2016 Oct 10:1-7
- <sup>xix</sup> Melnick ER, Powsner SM. Empathy in the Time of Burnout. *Mayo Clin Proc.* 2016; 91(12):1678-1679
- <sup>xx</sup> Brazeau C, Schroeder R, Rovi S, Boyd L. Relationships between Medical Student Burnout, empathy, and professionalism Climate. *Acad Med* 2010;85:S33–S36
- <sup>xxi</sup> Orton PK, Pereira Gray D. Factors influencing consultation length in general/family practice. *Fam Pract.* 2016 Oct;33(5):529-34
- <sup>xxii</sup> Hojat M, Gonella JS, Nasca TJ et al. Physician empathy: Definition, components, measurement and relationship to gender and specialty. *Am J Psychiatry.* 2002;159:1563–1569
- <sup>xxiii</sup> Zachariae R, Pedersen CG, Jensen AB et al. Association of perceived physician communication style with patient satisfaction, distress, cancer-related self-efficacy, and perceived control over the disease. *Br J cancer.* 2003;88:658–665
- <sup>xxiv</sup> Kelley JM, Kraft-Todd G, Schapira L et al. The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PLoS One.* 2014. Apr 9;9(4):e94207
- <sup>xxv</sup> Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: a systematic review. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X660814
- <sup>xxvi</sup> Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' empathy and clinical outcomes for diabetic patients. *Acad Med.* 2011 Mar;86(3):359-64
- <sup>xxvii</sup> OCDE. Health Statistics 2016. Disponible en [http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH\\_PROC](http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH_PROC)
- <sup>xxviii</sup> Moreno-Jiménez, B., Carvajal R.R. y Escobar R.E. La evaluación del Burnout profesional. Factorialización del MBI-GS. Un análisis preliminar. [The evaluation of professional Burnout. Factorialization of the MBI-GS. A preliminary analysis.] *Ansiedad y Estrés.* 2001;7,69–78.



- 1  
2  
3  
4 <sup>xxix</sup> Yuguero O, Esquerda M, Marsal JR, Soler-González J. Association between Sick Leave Prescribing  
5 Practices and Physician Burnout and Empathy. *PLoS One*. 2015 Jul 21;10(7):e0133379  
6  
7 <sup>xxx</sup> Álvarez Gallego E., Fernández Ríos L. El síndrome de burnout o el desgaste profesional. [The burnout  
8 syndrome or professional burnout.] *Rev Asoc Esp Neuropsiq*. 2001; 21: 257–265.  
9  
10 <sup>xxxi</sup> Alcorta-GarzaA, González-Guerrero JF, Tavitas-Herrera S. Validación de la escala de empatía médica  
11 de Jefferson en estudiantes de medicina mexicanos [Validation of Jefferson scale of empathy among  
12 Mexican medical students]. *Salud Mental*. 2005;28:57-63  
13  
14 <sup>xxxii</sup> Hojat m, Gonnella JS, Nasca Tj. The Jefferson scale of physician empathy: further psychometric data  
15 and differences by gender and speciality at item level. *Acad Med*.2002;7:S58–60  
16  
17 <sup>xxxiii</sup> Brugués A, Peris A, Pavón F, Mateo E, Gascón J, Flores G. Evaluation of Nurse Demand Management  
18 in Primary Care. *Aten Primaria* 2016;48:159-65  
19  
20 <sup>xxxiv</sup> Dempsey C, Reilly BA, et al. Nurse Engagement: What are the Contributing Factors for Success?  
21 *Online J Issues Nurs*. 2016 Jan 31;21(1):2  
22  
23 <sup>xxxv</sup> Navarro-González D, Ayechu-Díaz A, Huarte-Labiano I. Prevalence of burnout syndrome and its  
24 associated factors in Primary Care staff]. *Semergen*. 2015 May-Jun;41(4):191-8  
25  
26 <sup>xxxvi</sup> Lorbe M, Skela B. Job satisfaction of nurses and identifying factors of job satisfaction in Slovenian  
27 Hospitals *Croat Med J*. 2012 Jun; 53(3): 263–270.  
28  
29 <sup>xxxvii</sup> Verghese A. Culture Shock — Patient as Icon, Icon as Patient *N Engl J Med* 2008; 359:2748-  
30 751December 25, 2008  
31  
32 <sup>xxxviii</sup> Arroyo AI, Guerrero O, Barneto A, Güimil T. “Luces y sombras de la medicina rural: a propósito de  
33 la docencia”. *Aten Primaria* 2007; 39: 219-220.  
34  
35 <sup>xxxix</sup> Shanafelt T, Mungo M, Schmitgen J, Storz K, Reeves D, Hayes S, et al. Longitudinal Study Evaluating  
36 the Association Between Physician Burnout and Changes in Professional Work Effort *Mayo Clin Proc*.  
37 2016;91(4):422-431  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	<b>Item No</b>	<b>Recommendation</b>
<b>Title and abstract</b>	1	(a) Indicate the study's design with a commonly used term in the title or the abstract <b>DONE PAGE 2</b> (b) Provide in the abstract an informative and balanced summary of what was done and what was found <b>DONE PAGE 2</b>
<b>Introduction</b>		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported <b>DONE PAGE 3- 4</b>
Objectives	3	State specific objectives, including any prespecified hypotheses <b>DONE PAGE 4</b>
<b>Methods</b>		
Study design	4	Present key elements of study design early in the paper <b>DONE PAGE 4</b>
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection <b>DONE PAGE 5</b>
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants <b>DONE PAGE 4-5</b>
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable <b>DONE PAGE 5</b>
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group <b>DONE PAG 5-6</b>
Bias	9	Describe any efforts to address potential sources of bias <b>DONE PAGE 9</b>
Study size	10	Explain how the study size was arrived at <b>DONE PAGE 5</b>
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why <b>DONE PAGE 5</b>
Statistical methods (PAGE 5-6)	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses
<b>Results</b>		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed <b>DONE PAGE 7</b> (b) Give reasons for non-participation at each stage NOT NECESSARY (c) Consider use of a flow diagram NOT NECESSARY
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders <b>DONE PAGE 7</b> (b) Indicate number of participants with missing data for each variable of interest
Outcome data	15*	Report numbers of outcome events or summary measures <b>DONE PAGE 7</b>
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included <b>DONE PAGE 7</b> (b) Report category boundaries when continuous variables were categorized <b>DONE PAGE 7</b> (c) If relevant, consider translating estimates of relative risk into absolute risk for a

1

2 meaningful time period

---

3 Other analyses 17 Report other analyses done—eg analyses of subgroups and interactions, and

4 sensitivity analyses **NOT APPLICABLE**

---

5 **Discussion**

---

6

7 Key results 18 Summarise key results with reference to study objectives **DONE PAGE 8**

---

8 Limitations 19 Discuss limitations of the study, taking into account sources of potential bias or

9 imprecision. Discuss both direction and magnitude of any potential bias **DONE**

10 **PAGE 9**

---

11 Interpretation 20 Give a cautious overall interpretation of results considering objectives, limitations,

12 multiplicity of analyses, results from similar studies, and other relevant evidence

13 **DONE PAGE 8**

---

14

15 Generalisability 21 Discuss the generalisability (external validity) of the study results **DONE PAGE 9**

---

16

17 **Other information**

---

18 Funding 22 Give the source of funding and the role of the funders for the present study and, if

19 applicable, for the original study on which the present article is based **DONE**

20 **PAGE 10**

---

21

22

23 \*Give information separately for exposed and unexposed groups.

24

25 **Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and

26 published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely

27 available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at

28 <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is

29 available at [www.strobe-statement.org](http://www.strobe-statement.org).

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

# BMJ Open

## Cross-Sectional study of the association between healthcare professionals' empathy and burnout and the number of annual primary care visits per patient under their care in Spain

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-020949.R1
Article Type:	Research
Date Submitted by the Author:	27-Feb-2018
Complete List of Authors:	Yuguero, Oriol; Institut de Recerca Biomedica de Lleida, Melnick, Edward; Yale University, Marsal, Josep Ramon; Primary Care Research Institute- IDIAP Jordi Gol. Universitat Autònoma of Barcelona, Lleida Research Support Unit; University Hospital Vall d'Hebron., Cardiovascular Department, Epidemiology Unit. Esquerda, Montserrat; Institut Borja de Bioetica Soler-Gonzalez, Jorge; Universitat de Lleida Facultat de Medicina
<b>Primary Subject Heading</b>:	Patient-centred medicine
Secondary Subject Heading:	Communication, Ethics, Health services research
Keywords:	Empathy, Burnout, PRIMARY CARE, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™  
Manuscripts

1  
2  
3 Cross-Sectional study of the association between healthcare professionals' empathy  
4 and burnout and the number of annual primary care visits per patient under their care  
5 in Spain  
6

7 Visits, empathy and burnout.  
8

9 Health Service Research  
10

11  
12 Oriol Yuguero<sup>1,2</sup>, Edward R. Melnick<sup>3</sup> Josep Ramon Marsal<sup>4,5</sup>, Montserrat Esquerda<sup>1,6</sup>,  
13 Jorge Soler-González<sup>1,2</sup>  
14

- 15 1. Faculty of Medicine. University of Lleida. Spain.
- 16 2. Biomedical Research Institute of Lleida. IRBLLEIDA Spain.
- 17 3. Department of Emergency Medicine, Yale School of Medicine, New Haven, CT,  
18 United States
- 19 4. Primary Care Research Institute (IDIAP). Spain.
- 20 5. Epidemiology Unit. Cardiovascular Department. Vall d'Hebron University  
21 Hospital. Barcelona. Spain.
- 22 6. Borja Bioethics Institute. Barcelona. Spain.  
23  
24  
25  
26

27 Corresponding Author:

28 Dr. ORIOL YUGUERO TORRES

29 Avda. Rovira Roure 80, 25198 Lleida

30 [Oriol.yuguero@gmail.com](mailto:Oriol.yuguero@gmail.com)

31 630246134  
32  
33  
34

35 Word Count: 2220 words

36 Tables: 2  
37

38 Authors declare no conflict of interest.  
39

40 English translation of this article was done with the support of the Languages Institute  
41 of the University of Lleida.  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Abstract

### Objective

The aim of this study was to evaluate the association between physician and nurse self-reported empathy and burnout and the number of annual primary care visits per patient under their care.

### Methods

Design: A cross-sectional survey study was conducted from January 2013 to July 2014

Site: The 22 Primary Care Centres of the Lleida Health Region in Spain.

Main Outcome Measures: The Jefferson Scale of Physician Empathy and Maslach Burnout Inventory were used to measure empathy and burnout, respectively. The number of visits and the number of diagnoses coded per visit were obtained through the Region's electronic health record.

### Results

267 healthcare professionals (physicians and nurses, 52.6% participation of the total in the Region) with a total of 301,657 patients under their care. Healthcare professionals' degree of burnout and empathy were associated with the number of annual visits per patient under their care. Burned out nurses and physicians received fewer visits (4.5 vs 3.7 in nurses) and (18.1 vs 18.9 in physicians). Whereas, more empathic physicians received more visits per patient (19.4 vs 17.2,  $p < 0.05$ ) and documented more diagnoses per visit (10.2 vs 9.7,  $p = 0.001$ ). Less burned out and less empathic nurses documented more diagnoses per visit (10.2 vs 10.0 and 8.2 vs 9.9,  $p < 0.05$ ).

### Conclusions

Empathy and burnout show a significant association with the number of annual primary care visits per patient healthcare professionals receive. These results should serve to promote empathic skills and establish organizational changes that promote practice efficiency and, in turn, reduce the degree of burnout of healthcare professionals.

Keywords: Empathy; Burnout; Primary Care; Management

### Strengths and Limitations

- Sample size based on data of more of 300.000 patients.
- Use of validate tools to evaluate empathy and burnout.
- The design of study, don't allow us to establish cause and outcome.
- The 52% of response rate could cause a selection bias.
- 

### Background

The primary care landscape has undergone major changes in recent years.<sup>1</sup> Administrative burdens<sup>2</sup>, volume of visits, and insufficient resources in times of cutbacks<sup>3</sup> are increasing work-related distress and burnout in healthcare professionals. Burnout is a syndrome characterized emotional exhaustion, decreased fulfilment, and the depersonalization.<sup>4</sup> Burnout impacts healthcare professionals professional and personal lives leading to physicians reducing clinical work hours or clinical practice altogether<sup>5</sup>, thus representing ethical challenges for those responsible for health institutions.<sup>6</sup> Moreover, burnout has an important impact on quality of care.<sup>7,8</sup> Continuing to deliver high quality primary care with high quality relationships with patients requires time.<sup>6</sup> Time constraints can lead to exhaustion and frustration, key elements of burnout.

Front line physicians with direct patient contact such as those practicing primary care, emergency medicine, and internal medicine have some of the highest rates of burnout.<sup>9,10</sup> In the United States in 2014, 55% of physicians reported symptoms of burnout<sup>11</sup>--an absolute increase of 10% from just three years prior.<sup>12</sup> These findings have prompted individual and system level solutions to combat burnout in healthcare professionals.<sup>3,13,14</sup> Specially among young professionals<sup>15</sup>.

1  
2  
3 Though some individuals may be more prone to burnout, this syndrome is job-related  
4 and situation-specific<sup>16</sup>. Reducing levels of burnout in health institutions is possible,  
5 thereby making it be an ethical responsibility for institutions to improve professional  
6 wellness.<sup>17</sup> Indeed skills that improve healthcare professionals' empathic capacity have  
7 been shown to be associated with lower levels of burnout<sup>18,19,20</sup>. The theory is that  
8 when healthcare professionals understand and communicate patients' situations  
9 better, we feel more fulfilled, and we help to humanize care delivery, both  
10 fundamental elements in the prevention of burnout.<sup>21</sup> Since the degree of burnout or  
11 professional stress can affect the quality of communication with the patient, this study  
12 is particularly relevant given that healthcare professionals are being subjected to  
13 increasing clinical workloads and greater time constraints.<sup>22</sup> Physician stress and  
14 burnout are two of the factors that most influence the duration of a primary care  
15 visit.<sup>23</sup>

16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27 Clinical empathy has been described as the ability to understand others' feelings and  
28 thoughts and to communicate such understanding.<sup>24</sup> Clinical empathy has been shown  
29 to be associated with improved communication, patient satisfaction, and therapeutic  
30 compliance.<sup>25, 26</sup> Empathic physicians decrease patient anxiety, potentially leading  
31 better clinical outcomes.<sup>27, 28</sup>

32  
33  
34  
35  
36  
37 We have evaluated in different studies<sup>8</sup>, how high levels of burnout are linked  
38 with little empathy on the part of professionals<sup>18</sup>. The low empathic capacity,  
39 makes communication with patients difficult, and in many cases leads to  
40 depersonalization and in many cases to emotional exhaustion<sup>20</sup>. Two aspects  
41 those are fundamental in burnout. In fact, improving the communication skills of  
42 health professionals has been described as a resource to reduce burnout<sup>21</sup>.

43  
44  
45  
46  
47  
48  
49 The number of primary care visits per patient is used by the Organization for Economic  
50 Co-operation and Development (OECD)<sup>29</sup> as one of the measures of health system  
51 quality. In 2014, the average number of annual primary care visits per patient in Spain  
52 was 7.6 per year per person, above the European average of 7.1 and far greater than  
53 the 2.9 annual visits in Sweden.



1  
2  
3 We wanted to prove the effect of professionals with greater burnout in the number of  
4 visits they receive. But we also thought it would be interesting to see if those  
5 professionals with greater empathy received the same number of visits as  
6 professionals with less empathy.  
7  
8

9 Our team believe that empathic professionals solve patients' problems better, and do  
10 not need to receive as many visits. And that is related to the cost and quality of care.  
11  
12  
13

14  
15  
16 The aim of the present study is to evaluate the association between physician and  
17 nurse self-reported measures of empathy and burnout and the number of annual  
18 primary care visits per patient under their care.  
19  
20  
21  
22

## 23 **Methods**

### 24 **Participants and Study Design**

25  
26  
27 A cross-sectional survey study was conducted with volunteer participants. In the Lleida  
28 health region there are 22 primary care centres serving a population of about 366,000  
29 people. All physicians and nurses in the region were contacted by e-mail and asked to  
30 complete an anonymous survey that assessed their degree of burnout and empathy.  
31  
32 The study was conducted between January 2013 and July 2014. The survey was  
33 administered between May and July 2014.  
34  
35  
36  
37  
38  
39

### 40 Outcomes

#### 41 **Burnout and Empathy Evaluation**

42  
43 The degree of burnout was measured using the Spanish version of the Maslach  
44 burnout inventory (MBI), a 22-item scale validated in Spanish.<sup>30,31</sup> This scale measures  
45 the three dimensions of burnout: depersonalization, personal fulfilment, and  
46 emotional exhaustion.<sup>32</sup> Empathy was measured using the Spanish version of the  
47 Jefferson Scale of Physician Empathy (JSPE)<sup>33</sup>, a validated scale, recognized as the gold  
48 standard for measuring medical empathy, consisting of 20 items.<sup>34</sup> Both scales are  
49 scored using a 7-point Likert scale, with higher scores indicating higher burnout and  
50 greater empathy.  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

#### Annual visits per patient

We analysed the number of visits made by patients to their primary care team (nurse and family physician) between January 2013 and July 2014 (the year in which we collected data from healthcare professionals). . The number of visits is the number of contacts with de medical system either at nurses or physicians. Results were divided by 1.4 to obtain the number of visits per calendar year. The number of visits, age and gender of each patient were obtained from the records of the E-CAP electronic health record that is used by all the primary care professionals of the Catalan Health Institute. In our care health system the number of visits is automatically recorded so it is mandatory record the visit in the time table of the professional to receive the visit. It is important to note that the number of visits by each patient is different from the volume of visits that a healthcare professional was responsible for during that year. Given the varying roles and responsibilities of physicians and nurses within a single care team, we calculated separate values for this outcome for physicians and nurses.

#### Number of diagnoses coded per visit

We collected the number of diagnoses that the healthcare professional participants documented for each visit. The number and type of diagnoses were used to classify the severity and complexity of the visit. The diagnoses included in our analysis were diabetes, heart failure, ischemic heart disease, stroke, dyslipidaemia, hypertension, anemia, joint fibrillation, chronic renal failure, apnea, anxiety, depression, metabolic syndrome. So for an hypothetic patient with no diagnostics the number of diagnostics would be zero.

We defined the diagnostics (i.e. diabetes, heart failure, ischemic heart disease, etc) from the electronic records of the medical history (e-CAP). All the diagnostics were recorded from the practitioners using de ICD10 dictionary. It was defined by each diagnostic a binary variable indicating the presence or not and the sum of all of them

#### Participant Characteristics

The following sociodemographic data were collected for the practitioners: age, gender, professional category (physician or nurse) and practice setting (urban or rural).

## Data Analysis

Standard descriptive summary statistics were used to characterize the MBI and the JSPE scores. The reliability of the instruments was tested using Cronbach's  $\alpha$ . The Chi-square and Kolmogorov-Smirnov tests were used to evaluate the distribution of these scores. To analyse the association between the sociodemographic variables and the results of the JSPE, the MBI and the number of visits, the results were grouped into three categories (low, medium and high) using previously described value ranges and categories.<sup>12</sup> All results were to be presented with a 95% confidence interval. Results of association were compared using the Chi-square test. The results were disaggregated according to age, gender, professional category, and practice setting. For the data analysis, means, percentages and standard deviations were calculated using SPSS version 15.0 (IBM 2006)

## Ethical and confidentiality considerations

The study was approved by the Clinical Research Ethics Committee of the Jordi Gol Institute for Primary Care Research (IDIAP). The data were kept confidential and anonymous in accordance with the Spanish Data Protection Law 15/1999. All data were coded and accessible only to the primary care information system technicians who cross-referenced the data. All data were de-identified before being made available to the investigators.

## Patient and Public Involvement

No patients and public were involved in the study.

## Results

Of the total 267 healthcare professionals who participated in the study (response rate of 52.6% of practitioners in the region), 131 (49%) were nurses, 136 (51%) were physicians, 209 (78.3%) were women, and 156 (58.4%) work in rural areas. This sample was representative of the whole population of healthcare practitioners in the region according to the Ministry of Health of Catalunya. We have included in Table 1 data about sociodemographic variables. No significant differences were detected between

1  
2  
3 burnout and gender or professional role. Medical professionals practicing in rural areas  
4 reported a lower degree of empathy ( $p < 0.05$ ) but no significant differences in  
5 burnout. High empathy was associated with low burnout in both nurses and physicians  
6 ( $p < 0.05$ ) Cronbach's  $\alpha$ , was 0.733 for the MBI and 0.748 for the JSPE, what shows an  
7 adequate reliability of the scales used.  
8  
9  
10

### 11 12 13 Annual visits per patient

14 We analysed the annual number of visits per patient among 301,657 patients under  
15 the care of the participating 267 healthcare professionals. Nurses with higher burnout  
16 received fewer annual visits per patient. (4.5 visits vs 3.7 in the most burned out,  
17  $p = 0.001$ , Table 2). There was not a significant difference in the number of annual visits  
18 per patient based on nurses' degree of empathy. The most burned out physicians  
19 received fewer annual visits per patient (18.1 vs 18.9,  $p = 0.002$ , Table 3). Physicians  
20 with lower empathy received a higher number of visits by their patients (19.4 vs 17.2,  
21  $p = 0.001$ ).  
22  
23  
24  
25  
26  
27  
28  
29

### 30 Number of diagnoses coded per visit

31 Less burned out nurses (8.4 vs 9.9,  $p < 0.05$ ) and less empathic nurses (10 vs 10.2,  $p$   
32  $< 0.05$ ) documented more diagnoses per visit. Whereas physicians with medium range  
33 empathy documented the most diagnoses (10.2 vs 9.7,  $p = 0.001$ ). In addition,  
34 physicians with the highest degree of burnout were the ones that documented the  
35 most diagnoses per visit (10.2 vs 10,  $p < 0.05$ ).  
36  
37  
38  
39  
40  
41

## 42 Discussion

43  
44  
45 In this cross-sectional survey study, we found a significant association between  
46 primary care healthcare professionals' burnout and empathy and the annual number  
47 of visits per patient under their care. This large, highly representative sample is the  
48 first (to our knowledge) to analyze this association and is strengthened by the inclusion  
49 of both physicians and nurses. Few existing similar studies make it difficult to compare  
50 our results to the existing literature.  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 The healthcare professionals' degree of burnout and level of empathy were associated  
4 with the annual number of visits per patient under their care. The most empathic and  
5 least burned out physicians received fewer visits. We hypothesize that this relationship  
6 could be due to the fact that these physicians can better solve their patients' problems  
7 with fewer visits. We were unable to compare these results with other similar ones,  
8 since to date the literature<sup>10</sup> has only related the severity of consultation with the  
9 duration of the consultation, not with the number of encounters between physician  
10 and patient.  
11  
12  
13  
14  
15

16  
17  
18 However among nurses, the associations we found were different. Nurses with less  
19 burnout received a greater number of consultations. We should consider that tasks  
20 performed by nurses were generally associated with cures, health promotion, and case  
21 management<sup>35</sup>. We hypothesize that the nature of nurses' roles and responsibilities  
22 within the care team could influence this relationship, i.e., patients may perceive that  
23 they can consult the nurse more in a single visit without finding resistance. If so, less  
24 burned out nurses may not have mind receiving more visits by the same patient, to  
25 follow up and monitor the evolution of the patient's problems<sup>36, 37</sup>. Also in the field of  
26 nursing, we suspect this greater autonomy of visits and case management may be  
27 related to greater professional satisfaction<sup>38</sup>. Likewise, the professional situation also  
28 has an association in the documentation of the patients' diagnoses.  
29  
30  
31  
32  
33  
34  
35  
36  
37

38  
39 In reference to the number of diagnoses coded per visit, we believe that the results we  
40 have obtained reflect an association with the professional situation. As for empathy,  
41 both less empathic nursing staff and physicians document more diagnoses per visit.  
42 We hypothesize that professionals with better communication (and empathy) skills  
43 spend more time with the patient and less time documenting diagnoses. It should be  
44 noted that the recording of diagnoses in the computer program is important for two  
45 main reasons. On one hand, these diagnoses can serve as a rapid reference for other  
46 healthcare professionals caring for the same patient. On the other hand, the patient's  
47 clinical complexity is determined by the coded diagnoses, so qualifying for certain  
48 clinical programs (i.e inclusion in domiciliary health programs or palliative care) may  
49 depend on correct coding. For these reasons, we believe that healthcare professionals  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 with medium levels of empathy are the ones that focus on the care of patient in the  
4 interview but also understand the importance of the health records.  
5  
6

7  
8 However, it is striking that in the case of physicians, the most burned out physicians  
9 are the ones who record the most. This finding has been described previously, i.e.,<sup>39</sup>  
10 that burnout healthcare professionals are more likely to dehumanize their patients  
11 and, focus more on the *iPatient* than the actual human being in front of them. Similarly  
12 in Spain, documentation of more diagnoses increases financial incentives linked to  
13 quality indicators<sup>8</sup>.  
14  
15  
16  
17  
18

19  
20 We acknowledge several limitations to our study including the use of self-reported  
21 outcomes which although validated and widely used could lead to a reporting bias.  
22 Furthermore, the 52% of response rate could cause a selection bias. In our region, a  
23 large number of healthcare professionals work in rural areas, where access to family  
24 physicians and nurses (given the great geographical dispersion)<sup>40</sup> may be more difficult  
25 than in urban areas. There is also another bias, the number of hours the nurse or  
26 physician is working. This information could be important to evaluate this effect on  
27 empathy/burnout or number of visits. In addition, the majority group of healthcare  
28 professionals are those who are over 50 years of age. The design of study, don't allow  
29 us to establish cause and outcome. We have chosen that interpretation but we  
30 have to assume that interpretations in other directions could be done  
31  
32  
33  
34  
35  
36  
37  
38  
39

40  
41 The work relating empathy with burnout in our health region is a pioneer in our  
42 country and has managed to verify a reality that has been widely described in other  
43 countries and is the association that exists between the degree of empathy and  
44 burnout of professionals and the number of visits they make.  
45  
46

47  
48 We also consider an interesting line to continue investigating would be the realization  
49 of a qualitative study in order to detect the differences between doctors and nurses,  
50 and to analyze the relationship between teamwork and its influence with burnout.  
51 Based on the results, we believe that health institutions should continue to promote  
52 communication skills and other work relationship initiatives that reduce burnout  
53 among healthcare professionals. This would surely help to improve assistance and  
54 affect the quality indicators. An interesting line would be the realization of a  
55  
56  
57  
58  
59  
60

1  
2  
3 qualitative study with the objective of detecting differences between doctors and  
4 nurses, and to be able to develop, in this way, the concept of the grouping of empathy.  
5  
6

7 In conclusion, we believe that future research should focus on which communication  
8 skills and work situations can improve the quality of care. Promotion of such skills  
9 could lead to an improvement not only in the clinical quality of care but also in the  
10 working environment. Burnout levels have been linked with work effort. One of the  
11 most important implications of our study is to quantify the effect of healthcare  
12 professional burnout on patient care.<sup>41</sup> Health policymakers should be aware of the  
13 different measures that can reduce professional burnout (promote professional  
14 engagement, team building, flexible work schedule,..). Perhaps our findings should  
15 encourage introspection on alignment of financial incentives based on communication  
16 and empathy rather than traditional quality indicators like the number of diagnoses  
17 entered in the electronic health record. We believe that the results of our study may  
18 prove interesting for health organization leaders to encourage programs that promote  
19 empathic skills and to establish strategies that reduce the degree of burnout of  
20 healthcare professionals to improve the quality of patient care.  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

### 33 **Declarations/ Acknowledgements:**

- 34 1. Contributor ship statement: OY designed the study and wrote the main part of  
35 the paper. EM collaborate in the design of the paper and in its revision. JM did  
36 the statistical analysis. ME collaborate in the data collection and in the  
37 introduction research. JS reviewed the manuscript and collaborate in the  
38 revision of all the process.  
39
- 40 2. Competing interests: The authors declare no conflict of interest.  
41
- 42 3. Funding: The authors didn't received funds for this study. English translation of  
43 this article was done with the support of the Languages Institute of the  
44 University of Lleida.  
45
- 46 4. Data sharing statement: All the data is included in the article.  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Acknowledgments

To all the primary care professionals in our region whose selfless collaboration allowed our team to conduct this study.

Table 1

Sociodemographic variables depending on place of work

	Urban (n=111)		Rural (n=156)		Total (n=267)		P
	N	n (%)	N	n (%)	N	n (%)	
Age	111		156		267		0,915
31 - 40		26 (23,4%)		34 (21,8%)		60 (22,5%)	
41 - 50		40 (36%)		55 (35,3%)		95 (35,6%)	
>50		45 (40,5%)		67 (42,9%)		112 (41,9%)	
Professional Role	111		156		267		0,405
Nurse		50 (45%)		81 (51,9%)		131 (49,1%)	
Physician		61 (55%)		75 (48,1%)		136 (50,9%)	
Gender	111		156		267		0,349
Men		21 (18,9%)		37 (23,7%)		58 (21,7%)	
Women		90 (81,1%)		119 (76,3%)		209 (78,3%)	
<b>Empathy (JSPE)</b>	<b>111</b>		<b>156</b>		<b>267</b>		<b>0,018</b>
Low		27 (24,3%)		62 (39,7%)		89 (33,3%)	
Medium		38 (34,2%)		50 (32,1%)		88 (33%)	
High		46 (41,4%)		44 (28,2%)		90 (33,7%)	
Burnout	111		156		267		0,774
Low		63 (56,8%)		94 (60,3%)		157 (58,8%)	
Medium		43 (38,7%)		57 (36,5%)		100 (37,5%)	
High		5 (4,5%)		5 (3,2%)		10 (3,7%)	



**Table 2**

Characteristics of patients according to Empathy and Burnout of Nursing staff

EMPATHY	Low (n=52,173)	Medium (n=51,298)	High (n= 49,354)	Total (n=152,825)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women Patients</b>	25,851(49.5%)	25,290 (49.3%)	24,452 (49.5%)	75,593 (49.5%)	0.977
<b>Age</b>	48.1 (19.1)	48.4 (19.2)	48.5 (19.4)	48.3 (19.2)	0.014
<b>Visits 2014</b>	4.5 (6.9)	4.4 (6.6)	4.4 (6.6)	4.5 (6.7)	0.065
<b>Visits 2012</b>	18.9 (23.7)	18.6 (23.2)	18.6 (23)	18.7 (23.3)	0.075
<b>Number of diagnoses</b>	10.2 (8.5)	9.7 (8.3)	10 (8.3)	10 (8.4)	0.001
BURNOUT	High (n=1,496)	Medium (n=54,441)	Low (n=968,888)	Total (n=152,825)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	788 (52.7%)	27167 (49.9%)	47638 (49.2%)	75593 (49.5%)	0.001
<b>Age</b>	48.6 (18.8)	47.6 (18.8)	48.7 (19.5)	48.3 (19.2)	0.001
<b>Visits 2014</b>	3.7 (5.3)	4.3 (6.4)	4.5 (6.8)	4.5 (6.7)	0.001
<b>Visits 2012</b>	16.1 (19.7)	18.1 (22.1)	19.1 (24)	18.7 (23.3)	0.001
<b>Number of diagnoses</b>	8.4 (6.7)	10.2 (8.4)	9.9 (8.4)	10 (8.4)	0.001

Table 3

Characteristics of patients based on Empathy and Burnout of physicians.

EMPATHY	Low (n=42,138)	Medium (n=45,070)	High (n= 61,624)	Total (n=148,832)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	20,793 (49.3 %)	22,246 (49.4%)	30,765 (49.9%)	73,804 (49.6%)	0.052
<b>Age</b>	48.9 (19.3)	48.9 (19.4)	47.9 (19)	48.5 (19.2)	0.001
<b>Visits 2014</b>	4.6 (6.7)	4.5 (6.7)	4.1 (6.3)	4.4 (6.5)	0.001
<b>Visits 2012</b>	19.4 (23.5)	18.9 (23.8)	17.2 (21.7)	18.3 (22.9)	0.001
<b>Number of diagnoses</b>	9.7 (7.8)	10.2 (8.6 )	9.7 (8.3)	9.8 (8.3)	0.001
BURNOUT	High (n=9,660)	Medium (n=57,742)	Low (n=81,430)	Total (n=148,832)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	4,676 (48.4%)	28,798 (49.9%)	40,330 (49.5%)	73,804 (49.6%)	0.589
<b>Age</b>	47.9 (18.7)	48.6 (19.3)	48.5 (19.1)	48.5 (19.2)	0.003
<b>Visits 2014</b>	4.5 (6.6)	4.4 (6.5)	4.4 (6.5)	4.4 (6.5)	0.069
<b>Visits 2012</b>	18.9 (22.9)	18.4 (23.1)	18.1 (22.8)	18.3 (22.9)	0.002
<b>Number of diagnoses</b>	10.2 (8.8)	9.6 (7.9)	10 (8.5)	9.8 (8.3)	0.001

## REFERENCES

---

<sup>1</sup> Casado V. Construyendo la atención primaria española en una Europa cambiante. *Aten Primaria* 2016;48:71-2.

<sup>2</sup> Shanafelt T, Drybye L, Sinsky C, Hasan O, Satele D, Sloan J, et al. Relationship Between Clerical Burden and Characteristics of the Electronic Environment With Physician Burnout and Professional Satisfaction. *Mayo Clin Proc.* 2016;91:836-48

<sup>3</sup> Simó J ,Gervás J. Gasto sanitario en atención primaria en España: Insuficiente para ofrecer servicios atrayentes para pacientes y profesionales. *Informe SESPAS 2012 Gac Sanit.*2012; 26: 36-40

<sup>4</sup> Maslach C. *Burnout: The cost of caring.* Englewood Cliffs. N.J. Prentice Hall, 1982

<sup>5</sup> Olson K. Physician Burnout—A Leading Indicator of Health System Performance? *Mayo Clin Proc.* 2017; 92:1608–1611

<sup>6</sup> Shanafelt T, Noseworthy J. Executive Leadership and Physician Well-being: Nine Organizational Strategies to Promote Engagement and Reduce Burnout *Mayo Clin Proc.* 2017;92:129-146

<sup>7</sup> Dewa C, Loong D, Bonato S, Trojanowski L. The relationship between physician burnout and quality of healthcare in terms of safety and acceptability: a systematic review *BMJ Open* 2017;7:e015141.

<sup>8</sup> Yuguero O, Marsal JR, Buti M, Esquerda M, Soler-González J. Descriptive study of association between quality of care and empathy and burnout in primary care. *BMC Med Ethics.* 2017;18(1):54

<sup>9</sup> Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med.* 2012;172:1377-1385.

<sup>10</sup> Dyrbye, L., Shanafelt T, Sinsky C, Cipriano P, Bhatt J, Ommaya A et al. 2017. Burnout among health care professionals: A call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspectives. Discussion Paper, National Academy of Medicine, Washington, DC.* 2017. Available at [<https://nam.edu/burnout-among-health-care-professionals-a-call-to-explore-and-address-this-underrecognized-threat-to-safe-high-quality-care>].

<sup>11</sup> Medscape Lifestyle Report 2016. Available at: <http://www.medscape.com/features/slideshow/lifestyle/2016/public/overview#page=5>

- 1  
2  
3  
4 <sup>12</sup> Shanafelt T, Hasan O, Dyrbye L, Sinsky C, Satele D, Sloan J, et al. Changes in Burnout and Satisfaction  
5 With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014.  
6 Mayo Clin Proc. 2015;90:1600-1613  
7
- 8 <sup>13</sup> Burgess DJ, Beach MC, Saha S. Mindfulness practice: A promising approach to reducing the effects of  
9 clinician implicit bias on patients. Patient Educ Couns. 2016 doi: 10.1016/j.pec.2016.09.005  
10
- 11 <sup>14</sup> Bowman MA, Seehusen DA, Victoria Neale A. Interventions Must Be Realistic to Be Useful and  
12 Completed in Family Medicine. J Am Board Fam Med. 2018;31:1-4  
13
- 14  
15 <sup>15</sup> Hansen A, Peterson LE, Fang B, Phillips RL. Burnout in Young Family Physicians: Variation Across  
16 States. J Am Board Fam Med. 2018;31:7-8.  
17
- 18  
19 <sup>16</sup> Melnick E, Powsner S, Shanafelt T. In Reply—Defining Physician Burnout, and Differentiating Between  
20 Burnout and Depression. Mayo Clin Proc. 2017; 92: 1456-1458  
21
- 22 <sup>17</sup> Shanafelt T, Goh J, Sinsky C. The Business Case for Investing in Physician Well-being. JAMA Intern Med.  
23 doi:10.1001/jamainternmed.2017.4340  
24
- 25 <sup>18</sup> Yuguero O, Forné C, Esquerda M, Pifarré J, Abadías MJ, Viñas J. Empathy and burnout of emergency  
26 professionals of a health region: A cross-sectional study. Medicine (Baltimore). 2017 Sep;96(37):e8030  
27
- 28 <sup>19</sup> Gleichgerrcht E, Decety J (2013) Empathy in Clinical Practice: How Individual Dispositions, Gender, and  
29 Experience Moderate Empathic Concern, Burnout, and Emotional Distress in Physicians. PLoS ONE 8(4):  
30 e61526. doi:10.1371/journal.pone.0061526  
31
- 32 <sup>20</sup> Yuguero O, Marsal JR, Esquerda M, Soler-González J. Association between low empathy and high  
33 burnout among primary care physicians and nurses in Lleida, Spain. Eur J Gen Pract. 2016;10:1-7  
34
- 35 <sup>21</sup> Melnick ER, Powsner SM. Empathy in the Time of Burnout. Mayo Clin Proc. 2016; 91:1678-1679  
36
- 37 <sup>22</sup> Brazeau C, Schroeder R, Rovi S, Boyd L. Relationships between Medical Student Burnout, empathy,  
38 and professionalism Climate. Acad Med 2010;85:S33–S36  
39
- 40 <sup>23</sup> Orton PK, Pereira Gray D. Factors influencing consultation length in general/family practice. Fam  
41 Pract. 2016;33:529-34  
42
- 43 <sup>24</sup> Hojat M, Gonella JS, Nasca TJ et al. Physician empathy: Definition, components, measurement and  
44 relationship to gender and specialty. Am J Psychiatry. 2002;159:1563–1569  
45
- 46 <sup>25</sup> Zachariae R, Pedersen CG, Jensen AB et al. Association of perceived physician communication style  
47 with patient satisfaction, distress, cancer-related self-efficacy, and perceived control over the disease.  
48 Br J cancer. 2003;88:658–665  
49
- 50 <sup>26</sup> Kelley JM, Kraft-Todd G, Schapira L et al. The influence of the patient-clinician relationship on  
51 healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. PLoS  
52 One. 2014;9(4):e94207  
53  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3  
4 <sup>27</sup> Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: a systematic  
5 review. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X660814
- 6  
7 <sup>28</sup> Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' empathy and  
8 clinical outcomes for diabetic patients. *Acad Med.* 2011;86:359-64
- 9  
10 <sup>29</sup> OCDE. Health Statistics 2016. Disponible en  
11 [http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH\\_PROC](http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH_PROC)
- 12  
13 <sup>30</sup> Moreno-Jiménez, B., Carvajal R.R. y Escobar R.E. La evaluación del Burnout profesional.  
14 Factorialización del MBI-GS. Un análisis preliminar. [The evaluation of professional Burnout.  
15 Factorialization of the MBI-GS. A preliminary analysis.] *Ansiedad y Estrés.* 2001;7,69–78.
- 16  
17 <sup>31</sup> Yuguero O, Esquerda M, Marsal JR, Soler-González J. Association between Sick Leave Prescribing  
18 Practices and Physician Burnout and Empathy. *PLoS One.* 2015;10(7):e0133379
- 19  
20  
21 <sup>32</sup> Álvarez Gallego E., Fernández Ríos L. El síndrome de burnout o el desgaste profesional. [The burnout  
22 syndrome or professional burnout.] *Rev Asoc Esp Neuropsiq.* 2001; 21: 257–265.
- 23  
24 <sup>33</sup> Alcorta-GarzaA, González-Guerrero JF, Tavitas-Herrera S. Validación de la escala de empatía médica  
25 de Jefferson en estudiantes de medicina mexicanos [Validation of Jefferson scale of empathy among  
26 Mexican medical students]. *Salud Mental.* 2005;28:57-63
- 27  
28 <sup>34</sup> Hojat m, Gonnella JS, Nasca Tj. The Jefferson scale of physician empathy: further psychometric data  
29 and differences by gender and speciality at item level. *Acad Med.*2002;7:S58–60
- 30  
31 <sup>35</sup> Brugués A, Peris A, Pavón F, Mateo E, Gascón J, Flores G. Evaluation of Nurse Demand Management in  
32 Primary Care. *Aten Primaria* 2016;48:159-65
- 33  
34 <sup>36</sup> Dempsey C, Reilly BA, et al. Nurse Engagement: What are the Contributing Factors for Success? *Online*  
35 *J Issues Nurs.* 2016;21:2
- 36  
37 <sup>37</sup> Navarro-González D, Ayechu-Díaz A, Huarte-Labiano I. Prevalence of burnout syndrome and its  
38 associated factors in Primary Care staff]. *Semergen.* 2015;41:191-8
- 39  
40  
41 <sup>38</sup> Lorbe M, Skela B. Job satisfaction of nurses and identifying factors of job satisfaction in Slovenian  
42 Hospitals *Croat Med J.* 2012; 53: 263–270.
- 43  
44 <sup>39</sup> Vergheze A. Culture Shock — Patient as Icon, Icon as Patient *N Engl J Med* 2008; 359:2748-  
45 751December 25, 2008
- 46  
47 <sup>40</sup> Arroyo AI, Guerrero O, Barneto A, Güimil T. “Luces y sombras de la medicina rural: a propósito de la  
48 docencia”. *Aten Primaria* 2007; 39: 219-220.
- 49  
50 <sup>41</sup> Shanafelt T, Mungo M, Schmitgen J, Storz K, Reeves D, Hayes S, et al. Longitudinal Study Evaluating  
51 the Association Between Physician Burnout and Changes in Professional Work Effort *Mayo Clin Proc.*  
52 2016;91:422-431
- 53  
54  
55  
56  
57  
58  
59  
60

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	<b>Item No</b>	<b>Recommendation</b>
<b>Title and abstract</b>	1	(a) Indicate the study's design with a commonly used term in the title or the abstract <b>DONE PAGE 2</b> (b) Provide in the abstract an informative and balanced summary of what was done and what was found <b>DONE PAGE 2</b>
<b>Introduction</b>		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported <b>DONE PAGE 3- 4</b>
Objectives	3	State specific objectives, including any prespecified hypotheses <b>DONE PAGE 4</b>
<b>Methods</b>		
Study design	4	Present key elements of study design early in the paper <b>DONE PAGE 4</b>
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection <b>DONE PAGE 5</b>
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants <b>DONE PAGE 4-5</b>
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable <b>DONE PAGE 5</b>
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group <b>DONE PAG 5-6</b>
Bias	9	Describe any efforts to address potential sources of bias <b>DONE PAGE 9</b>
Study size	10	Explain how the study size was arrived at <b>DONE PAGE 5</b>
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why <b>DONE PAGE 5</b>
Statistical methods (PAGE 5-6)	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses
<b>Results</b>		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed <b>DONE PAGE 7</b> (b) Give reasons for non-participation at each stage NOT NECESSARY (c) Consider use of a flow diagram NOT NECESSARY
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders <b>DONE PAGE 7</b> (b) Indicate number of participants with missing data for each variable of interest
Outcome data	15*	Report numbers of outcome events or summary measures <b>DONE PAGE 7</b>
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included <b>DONE PAGE 7</b> (b) Report category boundaries when continuous variables were categorized <b>DONE PAGE 7</b> (c) If relevant, consider translating estimates of relative risk into absolute risk for a

1

2 meaningful time period

---

3 Other analyses 17 Report other analyses done—eg analyses of subgroups and interactions, and

4 sensitivity analyses **NOT APPLICABLE**

---

5 **Discussion**

---

6

7 Key results 18 Summarise key results with reference to study objectives **DONE PAGE 8**

---

8 Limitations 19 Discuss limitations of the study, taking into account sources of potential bias or

9 imprecision. Discuss both direction and magnitude of any potential bias **DONE**

10 **PAGE 9**

---

11 Interpretation 20 Give a cautious overall interpretation of results considering objectives, limitations,

12 multiplicity of analyses, results from similar studies, and other relevant evidence

13 **DONE PAGE 8**

---

14

15 Generalisability 21 Discuss the generalisability (external validity) of the study results **DONE PAGE 9**

---

16

17 **Other information**

---

18 Funding 22 Give the source of funding and the role of the funders for the present study and, if

19 applicable, for the original study on which the present article is based **DONE**

20 **PAGE 10**

---

21

22

23 \*Give information separately for exposed and unexposed groups.

24

25 **Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and

26 published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely

27 available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at

28 <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is

29 available at [www.strobe-statement.org](http://www.strobe-statement.org).

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

# BMJ Open

## Cross-Sectional study of the association between healthcare professionals' empathy and burnout and the number of annual primary care visits per patient under their care in Spain

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-020949.R2
Article Type:	Research
Date Submitted by the Author:	09-May-2018
Complete List of Authors:	Yuguero, Oriol; Institut de Recerca Biomedica de Lleida, Melnick, Edward; Yale University, Marsal, Josep Ramon; Primary Care Research Institute- IDIAP Jordi Gol. Universitat Autònoma of Barcelona, Lleida Research Support Unit; University Hospital Vall d'Hebron., Cardiovascular Department, Epidemiology Unit. Esquerda, Montserrat; Institut Borja de Bioetica Soler-Gonzalez, Jorge; Universitat de Lleida Facultat de Medicina
<b>Primary Subject Heading</b>:	Patient-centred medicine
Secondary Subject Heading:	Communication, Ethics, Health services research
Keywords:	Empathy, Burnout, PRIMARY CARE, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

SCHOLARONE™  
Manuscripts



1  
2  
3 Cross-Sectional study of the association between healthcare professionals' empathy  
4 and burnout and the number of annual primary care visits per patient under their care  
5 in Spain  
6

7 Visits, empathy and burnout.  
8

9 Health Service Research  
10

11  
12 Oriol Yuguero<sup>1,2</sup>, Edward R. Melnick<sup>3</sup> Josep Ramon Marsal<sup>4,5</sup>, Montserrat Esquerda<sup>1,6</sup>,  
13 Jorge Soler-González<sup>1,2</sup>  
14

- 15 1. Faculty of Medicine. University of Lleida. Spain.
- 16 2. Biomedical Research Institute of Lleida. IRBLLEIDA Spain.
- 17 3. Department of Emergency Medicine, Yale School of Medicine, New Haven, CT,  
18 United States
- 19 4. Primary Care Research Institute (IDIAP). Spain.
- 20 5. Epidemiology Unit. Cardiovascular Department. Vall d'Hebron University  
21 Hospital. Barcelona. Spain.
- 22 6. Borja Bioethics Institute. Barcelona. Spain.  
23  
24  
25  
26

27 Corresponding Author:

28 Dr. ORIOL YUGUERO TORRES

29 Avda. Rovira Roure 80, 25198 Lleida

30 [Oriol.yuguero@gmail.com](mailto:Oriol.yuguero@gmail.com)

31 630246134  
32  
33  
34

35 Word Count: 2220 words

36 Tables: 2  
37

38 The authors declare no conflicts of interest.  
39

40 The English translation of this article was rendered with the support of the Languages  
41 Institute of the University of Lleida.  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

## Abstract

### Objective

The aim of this study was to evaluate the association between physician and nurse self-reported empathy and burnout and the number of annual primary care visits per patient under their care.

### Methods

Design: A cross-sectional survey study was conducted from January 2013 to July 2014

Site: The 22 Primary Care Centres of the Lleida Health Region in Spain.

Main Outcome Measures: The Jefferson Scale of Physician Empathy and the Maslach Burnout Inventory were used to measure empathy and burnout, respectively. The number of visits and the number of diagnoses coded per visit were obtained through the Region's electronic health record.

### Results

Two hundred and sixty-seven healthcare professionals (physicians and nurses, 52.6% participation of the total in the region) with 301,657 patients under their care. Healthcare professionals' degree of burnout and empathy was associated with the number of annual visits per patient under their care. Burned out nurses and physicians received fewer visits (4.5 vs 3.7 in nurses and 18.1 vs 18.9 in physicians), whereas more empathic physicians received more visits per patient (19.4 vs 17.2,  $p < 0.05$ ) and documented more diagnoses per visit (10.2 vs 9.7,  $p = 0.001$ ). Less burned out and less empathic nurses documented more diagnoses per visit (10.2 vs 10.0 and 8.2 vs 9.9,  $p < 0.05$ ).

### Conclusions

The number of annual primary care visits per patient that healthcare professionals receive is closely associated with healthcare professionals' empathy and burnout. These results should serve to promote empathic skills and establish organizational changes that promote efficiency in the practice and, in turn, reduce the degree of burnout of healthcare professionals.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Keywords: Empathy; Burnout; Primary Care; Management

### Strengths and Limitations

- Sample size based on data of more of 300,000 patients.
  - Use of validated tools to evaluate empathy and burnout.
  - The study design does not allow us to establish cause and outcome.
  - The 52% response rate could cause selection bias.
- For peer review only

## Background

The primary care landscape has undergone major changes in recent years<sup>1</sup>. Administrative burdens<sup>2</sup>, volume of visits, and insufficient resources in times of cutbacks<sup>3</sup> are increasing work-related distress and burnout among healthcare professionals. Burnout is a syndrome characterized by emotional exhaustion, decreased fulfilment, and depersonalization<sup>4</sup>. Burnout affects healthcare professionals' professional and personal lives leading to physicians reducing their clinical working hours or practice altogether<sup>5</sup>, thus representing ethical challenges for those responsible for health institutions<sup>6</sup>. Moreover, burnout has an major impact on the quality of healthcare<sup>7,8</sup>. Continuing to deliver high quality primary care with high quality patient relationships requires time<sup>6</sup>. Time constraints can lead to exhaustion and frustration, which are key elements of burnout.

Front line physicians with direct patient contact such as those practising primary care, emergency medicine, and internal medicine have some of the highest rates of burnout<sup>9, 10</sup>. In the United States in 2014, 55% of physicians reported symptoms of burnout<sup>11</sup>, i.e., an absolute increase of 10% on just three years prior<sup>12</sup>. These findings have prompted individual- and system-level solutions to combat burnout among healthcare professionals<sup>3,13,14</sup>, especially among young professionals<sup>15</sup>.

Though some individuals may be more prone to burnout, this syndrome is job-related and situation-specific<sup>16</sup>. Reducing levels of burnout in health institutions is possible, thereby making it be an ethical responsibility for institutions to improve professional wellbeing<sup>17</sup>. Indeed skills that improve healthcare professionals' empathic capacity have been shown to be associated with lower levels of burnout<sup>18,19,20</sup>. The theory is that when healthcare professionals understand and communicate patients' situations better, we feel more fulfilled, and we help to humanize care delivery, both of which are fundamental elements in the prevention of burnout<sup>21</sup>. Since the degree of burnout or professional stress can affect the quality of communication with the patient, this study is particularly relevant given that healthcare professionals are being subjected to increasing clinical workloads and greater time constraints<sup>22</sup>. Physician stress and

1  
2  
3 burnout are two of the factors that most influence the duration of a primary care  
4 visit<sup>23</sup>.

5  
6  
7  
8 Clinical empathy has been described as the ability to understand others' feelings and  
9 thoughts and to communicate such understanding<sup>24</sup>. Clinical empathy has been shown  
10 to be associated with improved communication, patient satisfaction, and therapeutic  
11 compliance<sup>25, 26</sup>. Empathic physicians reduce patient anxiety, potentially leading to  
12 better clinical outcomes<sup>27, 28</sup>.

13  
14  
15  
16  
17  
18 We have evaluated in different studies<sup>8</sup> how high levels of burnout are linked with  
19 little empathy on the part of professionals<sup>18</sup>. Low empathic capacity hinders  
20 communication with patients and in many cases leads to depersonalization and  
21 emotional exhaustion<sup>20</sup>. These two aspects are fundamental in burnout. In fact,  
22 improving health professionals' communication skills has been described as a resource  
23 to reduce burnout<sup>21</sup>.

24  
25  
26  
27  
28  
29  
30 The number of primary care visits per patient is used by the Organization for Economic  
31 Co-operation and Development (OECD)<sup>29</sup> as one of the measures of health system  
32 quality. In 2014, the average number of annual primary care visits per patient in Spain  
33 was 7.6 per year per person, above the European average of 7.1 and far higher than  
34 the 2.9 annual visits in Sweden.

35  
36  
37  
38 We wished to prove the effect of professionals with greater burnout on the number of  
39 visits they receive. But we also thought it would be interesting to see if those  
40 professionals with greater empathy received the same number of visits as  
41 professionals with less empathy.

42  
43  
44  
45 Our team believes that empathic professionals solve patients' problems better, and do  
46 not need to receive as many visits. And this is related to the cost and quality of  
47 healthcare.

48  
49  
50  
51  
52  
53  
54 The aim of the present study is to evaluate the association between physician and

1  
2  
3 nurse self-reported measures of empathy and burnout and the number of annual  
4 primary care visits per patient under their care.  
5  
6  
7

## 8 **Methods**

9

### 10 Participants and Study Design

11  
12 A cross-sectional survey study was conducted with volunteer participants. In the Lleida  
13 health region there are 22 primary care centres serving a population of about 366,000.  
14 All physicians and nurses in the region were contacted by e-mail and asked to  
15 complete an anonymous survey that assessed their degree of burnout and empathy.  
16 The study was conducted between January 2013 and July 2014. The survey was  
17 administered between May and July 2014.  
18  
19  
20  
21  
22  
23

### 24 Outcomes

#### 25 Burnout and Empathy Evaluation

26  
27 The degree of burnout was measured using the Spanish version of the Maslach  
28 burnout inventory (MBI), a 22-item scale validated in Spanish<sup>30,31</sup>. This scale measures  
29 the three dimensions of burnout: depersonalization, personal fulfilment, and  
30 emotional exhaustion<sup>32</sup>. Empathy was measured using the Spanish version of the  
31 Jefferson Scale of Physician Empathy (JSPE)<sup>33</sup>, a validated scale, recognized as the gold  
32 standard for measuring medical empathy, consisting of 20 items<sup>34</sup>. Both scales are  
33 scored using a 7-point Likert scale, with higher scores indicating higher burnout and  
34 greater empathy.  
35  
36  
37  
38  
39  
40  
41  
42  
43

#### 44 Annual visits per patient

45  
46 We analysed the number of visits made by patients to their primary care team (nurse  
47 and family physician) between January 2013 and July 2014 (the year in which we  
48 collected data from healthcare professionals). The number of visits is the number of  
49 contacts with the medical system either with nurses or physicians. The results were  
50 divided by 1.4 to obtain the number of visits per calendar year. The number of visits,  
51 age and gender of each patient were obtained from the records of the E-CAP  
52 electronic health records that are used by all primary care professionals of the Catalan  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 Health Institute. In our healthcare system the number of visits is automatically  
4 recorded as it is mandatory to record the visit in the time table of the professional  
5 receiving the visit. It is important to note that the number of visits by each patient is  
6 different from the volume of visits for which a healthcare professional was responsible  
7 during that year. Given the varying roles and responsibilities of physicians and nurses  
8 within a single care team, we calculated separate values for this outcome for  
9 physicians and nurses.  
10  
11  
12  
13  
14  
15

#### 16 Number of diagnoses coded per visit

17  
18 We collected the number of diagnoses that the participant healthcare professionals  
19 documented for each visit. The number and type of diagnoses were used to classify the  
20 severity and complexity of the visit. The diagnoses included in our analysis were  
21 diabetes, heart failure, ischemic heart disease, stroke, dyslipidaemia, hypertension,  
22 anaemia, joint fibrillation, chronic renal failure, apnoea, anxiety, depression, metabolic  
23 syndrome. So for a hypothetical patient with no diagnoses the number of diagnoses  
24 would be zero.  
25  
26  
27  
28  
29  
30  
31

32 We defined the diagnoses (i.e. diabetes, heart failure, ischemic heart disease, etc.)  
33 from the electronic records of the medical history (e-CAP). All the diagnoses were  
34 recorded from the practitioners using the ICD10 dictionary. For each diagnose a binary  
35 variable was defined indicating presence or not and the sum of all of them.  
36  
37  
38  
39  
40

#### 41 Participant Characteristics

42 The following sociodemographic data were collected for the practitioners: age, gender,  
43 professional category (physician or nurse) and practice setting (urban or rural).  
44  
45  
46

#### 47 Data Analysis

48  
49 Standard descriptive summary statistics were used to characterize the MBI and the  
50 JSPE scores. The reliability of the instruments was tested using Cronbach's  $\alpha$ .  
51 The Chi-square and Kolmogorov-Smirnov tests were used to evaluate the distribution  
52 of these scores. To analyse the association between the sociodemographic variables  
53 and the results of the JSPE, the MBI and the number of visits, the results were grouped  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 into three categories (low, medium and high) using previously described value ranges  
4 and categories<sup>12</sup>. All results were to be presented with a 95% confidence interval.  
5  
6 Results of association were compared using the Chi-square test. The results were  
7  
8 disaggregated according to age, gender, professional category, and practice setting.  
9  
10 For data analysis, means, percentages and standard deviations were calculated using  
11  
12 SPSS version 15.0 (IBM 2006) software.  
13

#### 14 15 Ethical and confidentiality considerations

16  
17 The study was approved by the Clinical Research Ethics Committee of the Jordi Gol  
18  
19 Institute for Primary Care Research (IDIAP). The data were kept confidential and  
20  
21 anonymous in accordance with the Spanish Data Protection Law 15/1999.

22  
23 All data were coded and accessible only to the primary care information system  
24  
25 technicians who cross-referenced the data. All data were de-identified before being  
26  
27 made available to the investigators.

#### 28 29 **Patient and Public Involvement**

30  
31 No patients or public were involved in the study.  
32

#### 33 34 **Results**

35  
36  
37 Of the 267 healthcare professionals who participated in the study (response rate of  
38  
39 52.6% of all practitioners in the region), 131 (49%) were nurses, 136 (51%) were  
40  
41 physicians, 209 (78.3%) were women, and 156 (58.4%) work in rural areas. This sample  
42  
43 was representative of the whole population of healthcare practitioners in the region  
44  
45 according to the Ministry of Health of Catalonia. We have included data on  
46  
47 sociodemographic variables in Table 1. No significant differences were detected  
48  
49 between burnout and gender or professional role. Medical professionals practising in  
50  
51 rural areas reported a lower degree of empathy ( $p < 0.05$ ) but no significant differences  
52  
53 in burnout. High empathy was associated with low burnout in both nurses and  
54  
55 physicians ( $p < 0.05$ ), Cronbach's  $\alpha$  was 0.733 for the MBI and 0.748 for the JSPE, which  
56  
57 shows adequate reliability of the scales used.  
58  
59  
60



### Annual visits per patient

We analysed the annual number of visits per patient from the 301,657 patients under the care of the 267 participating healthcare professionals. Nurses with higher burnout received fewer annual visits per patient (4.5 visits vs 3.7 in the most burned out,  $p=0.001$ , Table 2). There was no significant difference in the number of annual visits per patient based on nurses' degree of empathy. The most burned out physicians received fewer annual visits per patient (18.1 vs 18.9,  $p=0.002$ , Table 3). Physicians with less empathy received a higher number of visits by their patients (19.4 vs 17.2,  $p=0.001$ ).

### Number of diagnoses coded per visit

Less burned out nurses (8.4 vs 9.9,  $p < 0.05$ ) and less empathic nurses (10 vs 10.2,  $p < 0.05$ ) documented more diagnoses per visit, whereas physicians with medium range empathy documented the most diagnoses (10.2 vs 9.7,  $p=0.001$ ). In addition, physicians with the highest degree of burnout were the ones that documented the most diagnoses per visit (10.2 vs 10,  $p < 0.05$ ).

## Discussion

In this cross-sectional survey study, we found a significant association between primary care healthcare professionals' burnout and empathy and the annual number of visits per patient under their care. This large, highly representative sample is the first (to our knowledge) to analyse this association and is strengthened by the inclusion of both physicians and nurses. Few similar studies make it difficult to compare our results to the existing literature.

The healthcare professionals' degree of burnout and level of empathy were associated with the annual number of visits per patient under their care. The most empathic and least burned out physicians received fewer visits. We hypothesize that this relationship could be due to the fact that these physicians can better solve their patients' problems with fewer visits. We were unable to compare these results with other similar ones, since to date the literature<sup>10</sup> has only related the severity of consultation with the

1  
2  
3 duration of the consultation, not with the number of encounters between physician  
4 and patient.  
5  
6

7  
8 However among nurses, the associations we found were different. Nurses with less  
9 burnout received a greater number of consultations. We should consider that tasks  
10 performed by nurses were generally associated with cures, health promotion, and case  
11 management<sup>35</sup>. We hypothesize that the nature of nurses' roles and responsibilities  
12 within the care team could influence this relationship, i.e., patients may perceive that  
13 they can consult the nurse more in a single visit without encountering resistance. If so,  
14 less burned out nurses may not have minded receiving more visits by the same  
15 patient, to follow up and monitor the evolution of the patient's problems<sup>36, 37</sup>. Also in  
16 the field of nursing, we suspect this greater autonomy of visits and case management  
17 may be related to greater professional satisfaction<sup>38</sup>. Likewise, the professional  
18 situation also has an association in the documentation of the patients' diagnoses.  
19  
20  
21  
22  
23  
24  
25  
26  
27

28  
29 In reference to the number of diagnoses coded per visit, we believe that the results we  
30 have obtained reflect an association with the professional situation. As for empathy,  
31 both less empathic nursing staff and physicians document more diagnoses per visit.  
32 We hypothesize that professionals with better communication (and empathy) skills  
33 spend more time with the patient and less time documenting diagnoses. It should be  
34 noted that the recording of diagnoses in the computer program is important for two  
35 main reasons. On the one hand, these diagnoses can serve as a rapid reference for  
36 other healthcare professionals caring for the same patient. On the other hand, the  
37 patient's clinical complexity is determined by the coded diagnoses, thus qualifying for  
38 certain clinical programmes (i.e., inclusion in domiciliary health programmes or  
39 palliative care) may depend on correct coding. For these reasons, we believe that  
40 healthcare professionals with medium levels of empathy are the ones that focus on  
41 patient care at the interview but also understand the importance of the health  
42 records.  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52

53  
54 However, it is striking that in the case of physicians, the most burned out are the ones  
55 who record the most visits. This finding has been described previously<sup>39</sup>, i.e., that  
56  
57  
58

1  
2  
3 burned out healthcare professionals are more likely to dehumanize their patients and  
4 focus more on the *iPatient* than the actual human being in front of them. Similarly in  
5 Spain, documentation of more diagnoses increases financial incentives linked to  
6 quality indicators<sup>8</sup>.  
7  
8  
9

10  
11 We acknowledge several limitations to our study including the use of self-reported  
12 outcomes which, though validated and widely used, could lead to a reporting bias.  
13 Furthermore, the 52% response rate could cause selection bias. In our region, a large  
14 number of healthcare professionals work in rural areas where access to family  
15 physicians and nurses (given the great geographical dispersion)<sup>40</sup> may be more difficult  
16 than in urban areas. There is also another bias, the number of hours the nurse or  
17 physician is working. This information could be important to evaluate the effect on  
18 empathy/burnout or number of visits. In addition, the majority of healthcare  
19 professionals are over 50 years of age. The study design does not allow us to establish  
20 cause and outcome. We have chosen this interpretation but we must assume that  
21 interpretations could be made in other directions. Finally, we think it would be positive  
22 to develop a multivariate analysis, to evaluate different factors affecting empathy and  
23 burnout. However, our data base was not done with that objective and it would be a  
24 good option for further research.  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35

36  
37 The work relating empathy with burnout in our health region is a first in our country  
38 and has managed to verify a reality that has been widely described in other countries,  
39 that is, the association that exists between the degree of empathy and burnout of  
40 professionals and the number of visits they receive.  
41  
42  
43  
44

45 We also consider an interesting line of further investigation would be to perform a  
46 qualitative study in order to detect differences between doctors and nurses, and to  
47 analyse the relationship between teamwork and its influence on burnout.  
48  
49

50 Based on the results, we believe that health institutions should continue to promote  
51 communication skills and other work relationship initiatives that reduce burnout  
52 among healthcare professionals. This would surely help to improve healthcare and  
53 affect quality indicators. An interesting line would be the performance of a qualitative  
54  
55  
56  
57

1  
2  
3 study to detect differences between doctors and nurses, and thus to be able to  
4 develop the concept of the grouping of empathy.  
5  
6  
7

8 In conclusion, we believe that future research should focus on which communication  
9 skills and work situations can improve the quality of care. Promoting such skills could  
10 lead to an improvement not only in the clinical quality of care but also in the working  
11 environment. Burnout levels have been linked with work effort. One of the most  
12 important implications of our study is to quantify the effect of healthcare  
13 professionals' burnout on patient care<sup>41</sup>. Health policymakers should be aware of the  
14 different measures that can reduce professional burnout (promoting professional  
15 engagement, team building, flexible work schedule,..). Perhaps our findings should  
16 encourage introspection on the alignment of financial incentives based on  
17 communication and empathy rather than on traditional quality indicators like the  
18 number of diagnoses entered in the electronic health record. We believe that the  
19 results of our study may prove interesting for health organization leaders to encourage  
20 programmes that promote empathic skills and to establish strategies that reduce the  
21 degree of burnout of healthcare professionals to improve the quality of patient care.  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33

#### 34 **Declarations/ Acknowledgements:**

- 35 1. Contributor statement: OY designed the study and wrote the main part of the  
36 paper. EM collaborated in the design of the paper and in its revision. JM  
37 performed the statistical analysis. ME collaborated in the collection of data and  
38 in the introductory research. JS reviewed the manuscript and collaborated in  
39 the revision of the entire process.  
40  
41  
42  
43
- 44 2. Competing interests: The authors declare no conflicts of interest.
- 45  
46 3. Funding: The authors did not received funds for this study. The English  
47 translation of this article was rendered with the support of the Languages  
48 Institute of the University of Lleida.  
49  
50
- 51 4. Data sharing statement: All data are included in the article.  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Acknowledgments

To all the primary care professionals in our region whose selfless collaboration allowed our team to conduct this study.

For peer review only

Table 1

Sociodemographic variables depending on place of work

	Urban (n=111)		Rural (n=156)		Total (n=267)		P
	N	n (%)	N	n (%)	N	n (%)	
Age	111		156		267		0,915
31 - 40		26 (23.4%)		34 (21.8%)		60 (22.5%)	
41 - 50		40 (36%)		55 (35.3%)		95 (35.6%)	
>50		45 (40.5%)		67 (42.9%)		112 (41.9%)	
Professional Role	111		156		267		0.405
Nurse		50 (45%)		81 (51.9%)		131 (49.1%)	
Physician		61 (55%)		75 (48.1%)		136 (50.9%)	
Gender	111		156		267		0.349
Men		21 (18.9%)		37 (23.7%)		58 (21.7%)	
Women		90 (81.1%)		119 (76.3%)		209 (78.3%)	
<b>Empathy (JSPE)</b>	<b>111</b>		<b>156</b>		<b>267</b>		<b>0.018</b>
Low		27 (24.3%)		62 (39.7%)		89 (33.3%)	
Medium		38 (34.2%)		50 (32.1%)		88 (33%)	
High		46 (41.4%)		44 (28.2%)		90 (33.7%)	
Burnout	111		156		267		0.774
Low		63 (56.8%)		94 (60.3%)		157 (58.8%)	
Medium		43 (38.7%)		57 (36.5%)		100 (37.5%)	
High		5 (4.5%)		5 (3.2%)		10 (3.7%)	

**Table 2**

Characteristics of patients according to Empathy and Burnout of Nursing staff

EMPATHY	Low (n=52,173)	Medium (n=51,298)	High (n= 49,354)	Total (n=152,825)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women Patients</b>	25,851(49.5%)	25,290 (49.3%)	24,452 (49.5%)	75,593 (49.5%)	0.977
<b>Age</b>	48.1 (19.1)	48.4 (19.2)	48.5 (19.4)	48.3 (19.2)	0.014
<b>Visits 2014</b>	4.5 (6.9)	4.4 (6.6)	4.4 (6.6)	4.5 (6.7)	0.065
<b>Visits 2012</b>	18.9 (23.7)	18.6 (23.2)	18.6 (23)	18.7 (23.3)	0.075
<b>Number of diagnoses</b>	10.2 (8.5)	9.7 (8.3)	10 (8.3)	10 (8.4)	0.001
BURNOUT	High (n=1,496)	Medium (n=54,441)	Low (n=968,888)	Total (n=152,825)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	788 (52.7%)	27167 (49.9%)	47638 (49.2%)	75593 (49.5%)	0.001
<b>Age</b>	48.6 (18.8)	47.6 (18.8)	48.7 (19.5)	48.3 (19.2)	0.001
<b>Visits 2014</b>	3.7 (5.3)	4.3 (6.4)	4.5 (6.8)	4.5 (6.7)	0.001
<b>Visits 2012</b>	16.1 (19.7)	18.1 (22.1)	19.1 (24)	18.7 (23.3)	0.001
<b>Number of diagnoses</b>	8.4 (6.7)	10.2 (8.4)	9.9 (8.4)	10 (8.4)	0.001

Table 3

Characteristics of patients based on Empathy and Burnout of physicians.

EMPATHY	Low (n=42,138)	Medium (n=45,070)	High (n= 61,624)	Total (n=148,832)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	20,793 (49.3 %)	22,246 (49.4%)	30,765 (49.9%)	73,804 (49.6%)	0.052
<b>Age</b>	48.9 (19.3)	48.9 (19.4)	47.9 (19)	48.5 (19.2)	0.001
<b>Visits 2014</b>	4.6 (6.7)	4.5 (6.7)	4.1 (6.3)	4.4 (6.5)	0.001
<b>Visits 2012</b>	19.4 (23.5)	18.9 (23.8)	17.2 (21.7)	18.3 (22.9)	0.001
<b>Number of diagnoses</b>	9.7 (7.8)	10.2 (8.6 )	9.7 (8.3)	9.8 (8.3)	0.001
BURNOUT	High (n=9,660)	Medium (n=57,742)	Low (n=81,430)	Total (n=148,832)	p
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
<b>Women patients</b>	4,676 (48.4%)	28,798 (49.9%)	40,330 (49.5%)	73,804 (49.6%)	0.589
<b>Age</b>	47.9 (18.7)	48.6 (19.3)	48.5 (19.1)	48.5 (19.2)	0.003
<b>Visits 2014</b>	4.5 (6.6)	4.4 (6.5)	4.4 (6.5)	4.4 (6.5)	0.069
<b>Visits 2012</b>	18.9 (22.9)	18.4 (23.1)	18.1 (22.8)	18.3 (22.9)	0.002
<b>Number of diagnoses</b>	10.2 (8.8)	9.6 (7.9)	10 (8.5)	9.8 (8.3)	0.001



## REFERENCES

---

<sup>1</sup> Casado V. Construyendo la atención primaria española en una Europa cambiante. *Aten Primaria*. 2016;48:71-2.

<sup>2</sup> Shanafelt T, Drybye L, Sinsky C et al. Relationship Between Clerical Burden and Characteristics of the Electronic Environment With Physician Burnout and Professional Satisfaction. *Mayo Clin Proc*. 2016;91:836-48

<sup>3</sup> Simó J ,Gervás J. Gasto sanitario en atención primaria en España: Insuficiente para ofrecer servicios atractivos para pacientes y profesionales. Informe SESPAS 2012. *Gac Sanit*. 2012; 26: 36-40

<sup>4</sup> Maslach C. *Burnout: The cost of caring*. Englewood Cliffs. N.J. Prentice Hall, 1982

<sup>5</sup> Olson K. Physician Burnout—A Leading Indicator of Health System Performance? *Mayo Clin Proc*. 2017; 92:1608–1611

<sup>6</sup> Shanafelt T, Noseworthy J. Executive Leadership and Physician Well-being: Nine Organizational Strategies to Promote Engagement and Reduce Burnout. *Mayo Clin Proc*. 2017;92:129-146

<sup>7</sup> Dewa C, Loong D, Bonato S et al. The relationship between physician burnout and quality of healthcare in terms of safety and acceptability: a systematic review *BMJ Open* 2017;7:e015141.

<sup>8</sup> Yuguero O, Marsal JR, Buti M, et al. Descriptive study of association between quality of care and empathy and burnout in primary care. *BMC Med Ethics*. 2017;18:54

<sup>9</sup> Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. 2012;172:1377-1385.

<sup>10</sup> Dyrbye L, Shanafelt T, Sinsky C, et al. 2017. Burnout among health care professionals: A call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. 2017. Available at [<https://nam.edu/burnout-among-health-care-professionals-a-call-to-explore-and-address-this-un-derrecognized-threat-to-safe-high-quality-care>].

<sup>11</sup> Medscape LifeStyle Report 2016. Available at: <http://www.medscape.com/features/slideshow/lifestyle/2016/public/overview#page=5>

<sup>12</sup> Shanafelt T, Hasan O, Dyrbye L, et al. Changes in Burnout and Satisfaction With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014. *Mayo Clin Proc*. 2015;90:1600-1613

<sup>13</sup> Burgess DJ, Beach MC, Saha S. Mindfulness practice: A promising approach to reducing the effects of clinician implicit bias on patients. *Patient Educ Couns*. 2017;100:372-376

<sup>14</sup> Bowman MA, Seehusen DA, Victoria Neale A. Interventions Must Be Realistic to Be Useful and Completed in Family Medicine. *J Am Board Fam Med*. 2018;31:1-4

- 1  
2  
3  
4 <sup>15</sup> Hansen A, Peterson LE, Fang B et al. Burnout in Young Family Physicians: Variation Across States. *J Am Board Fam Med.* 2018;31:7-8.  
5  
6  
7  
8 <sup>16</sup> Melnick E, Powsner S, Shanafelt T. In Reply—Defining Physician Burnout, and Differentiating Between  
9 Burnout and Depression. *Mayo Clin Proc.* 2017; 92: 1456-1458  
10  
11 <sup>17</sup> Shanafelt T, Goh J, Sinsky C. The Business Case for Investing in Physician Well-being. *JAMA Intern Med.*  
12 2017;1;177(1826-1832  
13 <sup>18</sup> Yuguero O, Forné C, Esquerda M, et al. Empathy and burnout of emergency professionals of a health  
14 region: A cross-sectional study. *Medicine (Baltimore).* 2017 Sep;96(37):e8030  
15  
16 <sup>19</sup> Gleichgerrcht E, Decety J. Empathy in Clinical Practice: How Individual Dispositions, Gender, and  
17 Experience Moderate Empathic Concern, Burnout, and Emotional Distress in Physicians. *PLoS ONE.* 2013;  
18 8: e61526. doi:10.1371/journal.pone.0061526  
19  
20 <sup>20</sup> Yuguero O, Marsal JR, Esquerda M, et al. Association between low empathy and high burnout among  
21 primary care physicians and nurses in Lleida, Spain. *Eur J Gen Pract.* 2016;10:1-7  
22  
23 <sup>21</sup> Melnick ER, Powsner SM. Empathy in the Time of Burnout. *Mayo Clin Proc.* 2016; 91:1678-1679  
24  
25 <sup>22</sup> Brazeau C, Schroeder R, Rovi S et al. Relationships between Medical Student Burnout, empathy, and  
26 professionalism Climate. *Acad Med* 2010;85:S33–S36  
27  
28 <sup>23</sup> Orton PK, Pereira Gray D. Factors influencing consultation length in general/family practice. *Fam*  
29 *Pract.* 2016;33:529-34  
30  
31 <sup>24</sup> Hojat M, Gonella JS, Nasca TJ et al. Physician empathy: Definition, components, measurement and  
32 relationship to gender and specialty. *Am J Psychiatry.* 2002;159:1563–1569  
33  
34 <sup>25</sup> Zachariae R, Pedersen CG, Jensen AB et al. Association of perceived physician communication style  
35 with patient satisfaction, distress, cancer-related self-efficacy, and perceived control over the disease.  
36 *Br J cancer.* 2003;88:658–665  
37  
38 <sup>26</sup> Kelley JM, Kraft-Todd G, Schapira L et al. The influence of the patient-clinician relationship on  
39 healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PLoS*  
40 *One.* 2014;9:e94207  
41  
42 <sup>27</sup> Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: a systematic  
43 review. *Br J Gen Pract* 2013; 63(606):e76-84  
44  
45 <sup>28</sup> Hojat M, Louis DZ, Markham FW, et al. Physicians' empathy and clinical outcomes for diabetic  
46 patients. *Acad Med.* 2011;86:359-64  
47  
48 <sup>29</sup> OCDE. Health Statistics 2016. Disponible en  
49 [http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH\\_PROC](http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH_PROC)  
50  
51 <sup>30</sup> Moreno-Jiménez B., Carvajal R., Escobar R. La evaluación del Burnout profesional. Factorialización del  
52 MBI-GS. Un análisis preliminar. [The evaluation of professional Burnout. Factorialization of the MBI-GS.  
53 A preliminary analysis.] *Ansiedad y Estrés.* 2001;7,69–78.  
54  
55  
56  
57  
58  
59  
60

- 
- 1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60
- <sup>31</sup> Yuguero O, Esquerda M, Marsal JR, et al. Association between Sick Leave Prescribing Practices and Physician Burnout and Empathy. *PLoS One*. 2015;10(7):e0133379
- <sup>32</sup> Álvarez E., Fernández L. El síndrome de burnout o el desgaste profesional. [The burnout syndrome or professional burnout.] *Rev Asoc Esp Neuropsiq*. 2001; 21: 257–265.
- <sup>33</sup> Alcorta-GarzaA, González-Guerrero JF, Tavitas-Herrera S. Validación de la escala de empatía médica de Jefferson en estudiantes de medicina mexicanos [Validation of Jefferson scale of empathy among Mexican medical students]. *Salud Mental*. 2005;28:57-63
- <sup>34</sup> Hojat m, Gonnella JS, Nasca Tj. The Jefferson scale of physician empathy: further psychometric data and differences by gender and speciality at item level. *Acad Med*.2002;7:S58–60
- <sup>35</sup> Brugués A, Peris A, Pavón F, et al. Evaluation of Nurse Demand Management in Primary Care. *Aten Primaria* 2016;48:159-65
- <sup>36</sup> Dempsey C, Reilly BA.. Nurse Engagement: What are the Contributing Factors for Success? *Online J Issues Nurs*. 2016;21:2
- <sup>37</sup> Navarro-González D, Ayechu-Díaz A, Huarte-Labiano I. Prevalence of burnout syndrome and its associated factors in Primary Care staff]. *Semergen*. 2015;41:191-8
- <sup>38</sup> Lorbe M, Skela B. Job satisfaction of nurses and identifying factors of job satisfaction in Slovenian Hospitals *Croat Med J*. 2012; 53: 263–270.
- <sup>39</sup> Vergheze A. Culture Shock — Patient as Icon, Icon as Patient *N Engl J Med* 2008; 359:2748-751
- <sup>40</sup> Arroyo AI, Guerrero O, Barneto A, et al.. “Luces y sombras de la medicina rural: a propósito de la docencia”. *Aten Primaria* 2007; 39: 219-220.
- <sup>41</sup> Shanafelt T, Mungo M, Schmitgen J, et al. Longitudinal Study Evaluating the Association Between Physician Burnout and Changes in Professional Work Effort *Mayo Clin Proc*. 2016;91:422-431

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	<b>Item No</b>	<b>Recommendation</b>
<b>Title and abstract</b>	1	(a) Indicate the study's design with a commonly used term in the title or the abstract <b>DONE PAGE 2</b> (b) Provide in the abstract an informative and balanced summary of what was done and what was found <b>DONE PAGE 2</b>
<b>Introduction</b>		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported <b>DONE PAGE 3- 4</b>
Objectives	3	State specific objectives, including any prespecified hypotheses <b>DONE PAGE 4</b>
<b>Methods</b>		
Study design	4	Present key elements of study design early in the paper <b>DONE PAGE 4</b>
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection <b>DONE PAGE 5</b>
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants <b>DONE PAGE 4-5</b>
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable <b>DONE PAGE 5</b>
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group <b>DONE PAG 5-6</b>
Bias	9	Describe any efforts to address potential sources of bias <b>DONE PAGE 9</b>
Study size	10	Explain how the study size was arrived at <b>DONE PAGE 5</b>
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why <b>DONE PAGE 5</b>
Statistical methods (PAGE 5-6)	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses
<b>Results</b>		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed <b>DONE PAGE 7</b> (b) Give reasons for non-participation at each stage NOT NECESSARY (c) Consider use of a flow diagram NOT NECESSARY
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders <b>DONE PAGE 7</b> (b) Indicate number of participants with missing data for each variable of interest
Outcome data	15*	Report numbers of outcome events or summary measures <b>DONE PAGE 7</b>
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included <b>DONE PAGE 7</b> (b) Report category boundaries when continuous variables were categorized <b>DONE PAGE 7</b> (c) If relevant, consider translating estimates of relative risk into absolute risk for a

1

2 meaningful time period

---

3 Other analyses 17 Report other analyses done—eg analyses of subgroups and interactions, and

4 sensitivity analyses **NOT APPLICABLE**

---

5 **Discussion**

---

6

7 Key results 18 Summarise key results with reference to study objectives **DONE PAGE 8**

---

8 Limitations 19 Discuss limitations of the study, taking into account sources of potential bias or

9 imprecision. Discuss both direction and magnitude of any potential bias **DONE**

10 **PAGE 9**

---

11 Interpretation 20 Give a cautious overall interpretation of results considering objectives, limitations,

12 multiplicity of analyses, results from similar studies, and other relevant evidence

13 **DONE PAGE 8**

---

14

15 Generalisability 21 Discuss the generalisability (external validity) of the study results **DONE PAGE 9**

---

16

17 **Other information**

---

18 Funding 22 Give the source of funding and the role of the funders for the present study and, if

19 applicable, for the original study on which the present article is based **DONE**

20 **PAGE 10**

---

21

22

23 \*Give information separately for exposed and unexposed groups.

24

25 **Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and

26 published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely

27 available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at

28 <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is

29 available at [www.strobe-statement.org](http://www.strobe-statement.org).

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60