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# **Physical activity level and lifestyle-related risk factors from Catalan Physicians**

## **Physical activity level from Physicians**

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## Abstract

**Background:** Physicians' own Physical Activity (PA) and other health-related habits influence PA promotion. The present study identifies the PA level, according to the current PA recommendations and other health-related habits of physicians from the Catalan Medical Council. **Methods:** 2,400 physicians (30 to 55 years) were randomly selected to generate a target sample of 800; each received a self-administered questionnaire identifying medical specialization, work setting, health self-perception, body mass index (BMI), PA and smoking habits. **Results:** 762 physicians responded (52% female). Almost one in two (49.3%) exercised sufficiently, nearly all self-perceived good health, while 80.5% were non-smokers. Almost 6 in 10 males reported overweight or obesity (56.9%) versus 18.2% of females. Active physicians dominated specific groups; (i) aged 45-55 years, (ii) specializing either in primary care or surgery, (iii) working in the private sector, (iv) BMI <25 kg/m<sup>2</sup>, (v) perceiving themselves in good health, or (vi) having free leisure time. **Conclusions:** Only half of Catalan physicians met current PA recommendations; male physicians were particularly at risk of overweight/obesity. Overweight and under exercise were associated with private workplaces and positive health perceptions, meaning that it is now possible to target inactive and/or overweight Catalan physicians in future interventions.

**Keywords:** physical activity, prescription, habits, obesity.

## Introduction

Physical inactivity, overweight/obesity and smoking are the most important worldwide behavioral risk factors, raising the risk of chronic diseases and premature death.<sup>1</sup> Addressing the ill-health associated with physical inactivity that is then imposed on health-care systems worldwide requires consideration not only of patient lifestyles but also of staff delivering this care. Approximately, 60% of adults are physically inactive and overweight/obesity is a modern day pandemic; these issues also play out among physicians' groups.<sup>2,3</sup>

Given that secondary and tertiary prevention has been largely unsuccessful for reversing the negative societal trends toward physical inactivity, more emphasis should be placed on primary prevention.<sup>4</sup> There is a compelling case here; one analysis from Scotland has suggested that primary prevention, including modification of health-related behaviors, contributes about four times as much to health outcomes as medically-based secondary prevention efforts.<sup>5</sup> Given their wide access within the population, physicians can have a unique and strong influence on patients' health.<sup>6</sup> As the single most universally important area for improved health behaviour<sup>7</sup>, it makes sense that all physicians promote physical activity among their patients.

Importantly, Petrella and Lattanzio<sup>8</sup> found that patients increased their levels of PA when their primary care physicians counsel them. In general practice, this increase also improved quality of life over 12-months.<sup>9</sup> However, systematic PA counseling is still relatively uncommon.<sup>6</sup> In Catalonia, 88% of physicians and nurses promoted PA infrequently.<sup>10</sup> Lack of time, training or effective protocols are each regarded as powerful barriers to more systematic PA promotion.<sup>11</sup>

While a number of factors can positively increase PA promotion, including physicians' self-confidence, knowledge, appearance and/or professional motivation<sup>10,12,13</sup> several studies highlight the importance of physicians' personal health behaviours.<sup>14</sup> The effectiveness of PA promotion is influenced by physicians' own PA level<sup>6,15,16</sup>, perhaps because exercising physicians are more confident about helping patients to handle the specific issues around becoming more physically active. Thus, it is important to explore the health-related habits of physicians and identify those groups presenting some lifestyle risk factor.

The present study has three aims, (i) to assess PA level and other health-related habits from a sample of physicians from the Catalan Medical Association, (ii) to identify factors characterizing physically active physicians and (iii) to identify combinations of lifestyle risk factors (LRFs) among physicians.

## **Methods**

### **Context**

In Catalonia, a Spanish region of around 7.5 million inhabitants, 40% of the population is sedentary and around 50% are either overweight or obese.<sup>17</sup> For PA prescription to be effective and to be cost-effective, the role of physicians' own behaviors, PA level and health-related habits should be explored. At the time of undertaking this work, no existing data were available regarding the promotion or adoption of the current PA recommendations by Catalan physicians.

### **Sample and design**

The data of the present study was part of the survey “Health, lifestyle and work conditions of physicians from Catalonia”.<sup>18</sup> It was targeted on all physicians registered in the Catalan Medical Council, aged 30 to 55 years, and whose professional activity involved patient care. Physicians were selected randomly from blind lists provided by the local medical colleges. Physicians on special leave or who worked exclusively in management, training, or research were excluded. The internal distribution of selected participants was proportional to the known characteristics of gender, age, area and medical specialty. Care was taken to adhere to all ethical research standards, as prescribed by Spanish law, to prevent linking the identities of study participants to their responses (Spanish Organic Law 15/1999 of 13 December on the Protection of Personal Data).

The survey was based on self-reported responses to 86 pre-coded items. The field work, mailing and completion of the questionnaire spanned December 2005 to April 2006. The sample was designed to generate 800 completed questionnaires (4.2% of the total of registered staff) to be representative of physicians aged 30-55 years involved in patient care in the Catalan Medical Council. Questionnaires were posted to 2,400 registered physicians (13% of the total registered) in Catalonia. An intensive telephone follow-up process was established to obtain the required response rate. Replacements for non-responders were identified by matching for age, gender, medical specialization and postal district.

The present study focuses on data related to PA, health-related habits and socio-demographic variables that could influence PA level. To assess PA level, a 2-week PA recall test was used. Walking, sports and other form of PA were assessed. The frequency (days/week), duration (time/day), and type were also identified.

Outcome measures

Total PA was calculated by summing the weekly minutes devoted to walking, sports or PA. These same data were also converted to Metabolic Equivalents (METs): the energy cost of PA as multiples of resting metabolic rate, which is defined as the ratio of metabolic rate during a specific PA to a reference rate of metabolic rate at rest ( $3.5 \text{ ml O}_2 \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ ). Weekly PA was reclassified according to the current PA recommendations into (i) sedentary, (ii) under-exercising and (iii) exercising (achieving 150+ minutes a week of moderate PA or 75+ minutes of weekly vigorous PA or an equivalent combination of moderate- and vigorous-intensity aerobic activity).<sup>19</sup> Body Mass Index (BMI) was calculated from height and weight ( $\text{kg}/\text{m}^2$ ). Health status was reported through a self-perception rating<sup>20</sup>, while mental health was obtained from the General Health Questionnaire 12 (GHQ-12). Scores of  $>2$  were considered to indicate poor mental health.<sup>21</sup>

## Analysis

Double data entry helped to ensure data entry quality. The normality of distribution for numerical variables was tested using the Kolmogorov-Smirnov test. Categorical variables were described by frequencies and percentages. Differences between categorical variables (demographic-, work- and lifestyle/health-related data) were analyzed by chi-square test. Binary logistic regressions with Wald selection were used to predict the likelihood of reporting lifestyle risk factors. The binary dependent variables were under-exercising ( $\leq 150$  minutes PA/week, including sedentary),  $\text{BMI} \geq 25 \text{ kg}/\text{m}^2$  or having both lifestyle risk factors (LRFs). Odds ratio (OR) and 95% confidence intervals (CI) were calculated as a measure of strength of association for each variable. The model was adjusted by demographic (gender, age group, work sector) and health-related variables (BMI, PA level, smoking habit, having chronic disease, health status and mental health status). Data were analyzed using SPSS version 18.0.

## Results

From 2,400 sent questionnaires, 762 physician response sets (31.8%; 403 women aged 43.5  $\pm$ 6.8 years; 359 men aged 46.2  $\pm$ 6.3 years old) were analyzed. This sample is representative of all of the male and female doctors in Catalonia (according to previously stated criteria in the methods: aged 30-55 years, involved in patient care and registered in the Catalan Medical Council) and achieves a margin of error of  $\pm$ 3.55% of the total.

Sample characteristics are described in Table 1. Almost all physicians reported a positive perception of health and were non-smokers. However, 36.4% reported a BMI  $\geq$ 25 kg/m<sup>2</sup>, with a higher percentage of overweight and obesity index among males (56.9%) over females (18.2%), ( $p < .01$ ).

In the previous two weeks, 79.8% of respondents reported walking as a leisure time exercise and 54.9% reported engaging in sports or some other type of PA. The average weekly minutes ( $\pm$ SD) for walking were 122.5 ( $\pm$ 154.5) and 446.1 ( $\pm$ 981.1) minutes/week for sports and PA. Average MET min/week ( $\pm$ SD) were (i) walking, 416.8 ( $\pm$ 612.9); (ii) PA, 2525.2 ( $\pm$ 5832.8); (iii), overall PA (including walking and sports) 2942.0 ( $\pm$ 5930.9). The most common types of PA were walking for exercise ( $n=608$ ; 79.8%), exercising in a fitness centre ( $n=148$ ; 19.4%), cycling ( $n=86$ ; 11.2%), swimming ( $n=75$ ; 9.8%) and running ( $n=50$ ; 6.6%).

Almost half of respondents (49.3%) met current PA recommendations, 38.5% were under-exercisers and 12.2% were sedentary. Significant differences were found between PA levels and these following demographic, health and workplace variables; exercising physicians were proportionately most common among (i) 45 to 55 year olds (53.3%), (ii)



those without children (56.7%) (table 2), (iii) those specializing in primary care (55.8%) or (iv) in medical-surgical (54.1%); (v) those working in the private sector (59.3%) (table 2), (vi) those reporting a healthy BMI (53.6%), (vii) those with a positive self-perceived general health (56.7%), (viii) a positive mental health (51.6%) or (ix) those who reported 'always' having leisure time (84.0%) (table 3). The most sedentary physicians were those who reported 'poor' self-perceived general health (25.0%), obesity (27.8%) or current smokers (19.1%) (table 3).

No significant differences were found between PA levels for gender, family structure (living alone, as a couple or with children), and number of acknowledged health problems (having one or two+ chronic conditions).

While 27.4% of physicians did not present any LRFs, 72.6% presented one or more from under-exercising, BMI  $\geq 25$  kg/m<sup>2</sup> and a current smoking habit. Physical inactivity was the commonest of the LRFs (24.1%), while the most common combination paired under-exercising with BMI  $\geq 25$  kg/m<sup>2</sup> (17.5%).

Table 4 shows the predictors for (i) under-exercising, (ii) a BMI  $\geq 25$  kg/m<sup>2</sup> or (iii) both. After controlling for demographic (gender, age, work sector) and health-related data (BMI, PA, smoking habit, having chronic disease, health status and mental health status), under-exercising was best predicted by being aged 30 to 44, working in the public sector, having a BMI  $\geq 25$  kg/m<sup>2</sup> and poor mental health. For BMI  $\geq 25$  kg/m<sup>2</sup> the best predictors were being male, aged 45 to 56, under-exercising, having one or more chronic diseases and self-reporting 'poor' health status. Males were three times more likely than females to present the combination of under-exercising and a BMI  $\geq 25$  kg/m<sup>2</sup> (OR=3.38; 95% CI=2.31-4.95,  $p < .01$ ). Furthermore, those who perceived 'Poor' health status were three times more likely to report both LRFs (OR=3.61; 95% CI=1.88-6.94) than those who perceived positive health status ( $p < .01$ ).

## Discussion

Physicians represent the core of the Catalan health care system and their well-being reflects not only its processes but also its outcomes. Collectively, this underlines the importance of the current study.

In relation to our intended target sample of 800, 95% (n=762) was achieved. However, calculated against the total number of distributed questionnaires (2,400), the response rate was 31.8%. We must take into account that the survey was sent by mail, the questionnaire was relatively long and it was addressed to a group with little spare time during their working hours. Other studies have also shown that initial response rates among physicians population are often problematic<sup>22-24</sup> and exhaustive follow-ups are needed. The current sample size of 762 compares with similar studies based on 298 in the US<sup>15</sup>, 735 in the UK <sup>25</sup> and 496 in Switzerland.<sup>26</sup>

There are three main findings from this study. First, there was low compliance with PA recommendations by Catalan physicians. Second, males demonstrated the highest prevalence of overweight and obesity. Third, the most physically active physicians were characterized by being aged 45-55 years, having a primary care or surgery medical specialty, working in the private work sector, reporting a BMI <25 kg/m<sup>2</sup> along with positive self-perceived health, having free leisure time. In contrast, the less physically active physicians were characterized by poor self-perceived general health, BMI ≥30 kg/m<sup>2</sup> and smoking habit.

Most Catalan physicians presented themselves as having positive health and not smoking. Yet, 70% presented at least one modifiable LRF. Compared to non-smoking, which is supported by smoking cessation counseling, the current data confirm that a

more positive approach is needed to promote physical activity and healthy weight among Catalan physicians, especially males. Although PA prescription was implanted in Catalan primary health care by the "Plan of Physical Activity, Sport and Health" (PAFES) <sup>27</sup> in 2008, the impact on physicians should be explored.

These findings are relevant to managers of health care systems for at least three main reasons; healthy staff attend work more regularly<sup>28</sup>, they counsel more regularly on healthy lifestyle habits and they do it more effectively.<sup>6,15,16</sup> The findings can help managers to target the groups of physicians who themselves are most in need of PA and health-related promotion. The current study also extends previous work by showing the most common LRFs, their combinations and what predicts them. Unsurprisingly, table 4 shows that overweight and under-exercising were linked; multiple unhealthy behaviors were also commonly combined. While older physicians were more likely to present overweight/obesity, younger physicians under-exercised. Further, physicians working in the public sector were more likely to under-exercise although they were not overweight. Table 4 identifies that being male and having poor health were the strongest predictors for both under-exercise and obesity. Low compliance with PA recommendations could also adversely influence the PA promotion that, in turn, influences patients' health. Physicians who do not exercise sufficiently may not present positive role modeling of behavior, self-discipline or commitment that supports regular PA.<sup>29</sup>

Previous literature, based on US and EU physician samples, has shown similar (49%)<sup>30</sup> or slightly higher (54-59%)<sup>25,31,32</sup> PA levels than in these Catalan physicians. Two other studies, using questionnaires similar to those in the present study (two-week and 7 days-recall), reported lower PA levels than was found in Catalan physicians. One Canadian study reported that only 30% of physicians were physically active<sup>33</sup>, while another study of US resident physicians showed that only 41% met current PA recommendations<sup>34</sup>. In contrast, higher levels of compliance with PA guidelines (92%) were found among a

sample of female Estonian physicians.<sup>35</sup> Although these differences may reflect genuine gender differences, i.e., women physicians tend to have better healthy habits than men, the use of different questionnaires or differences in the Health care systems make it difficult to compare between studies. These data confirm that, like physicians from other countries, Catalan physicians comply with the general PA recommendations. Comparing the results with the Catalan General Health Survey, more physicians than Catalan adults exercised regularly, where around 40% did not achieve the recommended level.<sup>17</sup>

Beyond the immediate health concern for individual physicians, the high prevalence of overweight/obesity among Catalan males' physicians may also undermine the credibility of lifestyle messages they deliver. However, this may not be a uniquely Catalan concern; these levels of overweight/obesity were similar to those found in US physicians, where overweight/obesity prevalence among males' physicians was also high.<sup>36,37</sup> Previous literature has shown that physicians with overweight or poor personal habits such as physical inactivity, are less likely to counsel patient about healthy lifestyle.<sup>16,38</sup> Moreover, patients are less confidence in their advice than in that from normal weight physicians.<sup>15,38,39</sup> Patients may also perceive overweight/obesity as being less unhealthy when they see it in their own physician or in large groups of physicians. Given the high prevalence of physical inactivity (40%) and overweight and obesity (50%) in Catalonia<sup>17</sup>, many Catalan patients have considerable potential to improve lifestyle, potentially facilitated by the help of their physician.

Previous literature<sup>29</sup> has shown that physicians with positive health behaviors tend to deliver more effective counseling. Our findings suggest that females support the most optimal lifestyles, yet almost one of four physicians in the current study presented one or more LRFs, with under-exercising or/and overweight/obesity being the most prevalent. Compared to females, males were six times more likely to be overweight and were three times more likely to present the combination of under-exercising and overweight. With

every Catalan physician handling around 1500 patients, these 370 under-exercising and sedentary physicians may be offering a less than optimal service regarding lifestyle counseling for more than 555,000 patients.<sup>40</sup> Furthermore, this number will expand by including physicians who exercise, but who do not currently promote PA because of the range of barriers that limit delivery and impact in most health care systems.

Although these data relate to the Catalan system, they align with results from studies in other countries. This confirms that the value of such case studies; the specific often illustrates the general. Further, these are all issues that influence current moves toward global management of non-communicable disease.

There are two main implications of the present study. Firstly, the evidence provides a better understanding of the health status of physicians in Catalonia and their exposure to different risk factors, especially physical inactivity. Secondly, the support, together with the Galatea Foundation<sup>18</sup>, the promotion and development of activities focussing on improving healthy habits and lifestyle amongst this professional collective. Gender is one of the principle variables that should be taken into account. Future interventions should focus on improving prevention and early detection of health-related problems, and promotion of healthy habits among male physicians. Future studies should investigate the impact of the Plan of Physical Activity, Sport and Health (PAFES) on PA level and PA counselling by Catalan physicians.

The study strengths included its size, reaching almost all the expected sample, its thoroughness and originality; it is the first study in Catalonia assessing PA level among physicians, reflecting current PA recommendations. The main study limitation is the reliance on self-reported data, which can be influenced by under- and/or overestimation of responses. Another limitation was the lack of information from non-responders, meaning that the representativeness of the sample is uncertain. Finally, the

questionnaire was focused on leisure time PA. Validated questionnaires such as the International Physical Activity Questionnaire (IPAQ)<sup>41</sup> that assess all PA domains could be used in future studies among physicians' populations.

In conclusion, the low compliance with the PA recommendations and the higher rate of overweight and obesity among males' physicians may each negatively impact on the Catalan health care system. Beyond concerns for the lifestyles and well-being of physicians, there are concerns about the spill-over of personal behavioral profiles into counseling of Catalan patients about viable and effective lifestyle options. Our data underline the importance of implementing programs aimed at engaging physicians in healthy and active lifestyle as a strategy to improve physicians' own health and increase PA level in the general population. Previous literature concluded that this type of interventions should be implemented in the process of the medical education, because it will affect the future advice and prescription by physicians (Lobelo, 2009, Frank 2008). In US, only 13% of 102 medical schools in 2002 included PA and health in their curricula (Lobelo, 2009). In Catalan Universities, PA promotion has not been on the medical curriculum since 2010. It is important that medical schools promote healthy lifestyle among students. Combining this with training on PA prescription through the PAFES program may offer a powerful approach for improving both physicians' own health and physicians' future attitudes towards positive preventive counseling.

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## Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

## Founding source

The authors declare no founding source.

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**Table 1** Sample distribution according to PA recommendations of ACSM/AHA<sup>†</sup> (demographic data).  
Groups differences according  $\chi^2$  test.

			PA recommendations of ACSM/AHA				
	n	%	Sedentary % (n)	Under- exercising % (n)	Exercising % (n)	Sig (p)	X <sup>2</sup>
Gender						0.111	2.541
Males	359	47.1	11.2 (40)	38.5 (138)	50.3 (180)		
Females	403	52.9	13.2 (53)	38.3 (154)	48.5 (195)		
Total	760	100	12.2 (93)	38.4 (292)	49.3 (375)		
Age (years)						0.002	12.494
30-44	330	43.4	16.7 (55)	39.1 (129)	44.2 (146)		
45-55	430	56.6	8.8 (38)	37.9 (163)	53.3 (229)		
Total	760	100	12.2 (93)	38.4 (292)	49.3 (375)		
Are you a parent?						0.027	7.198
Yes	525	69.3	13.0 (68)	41.0 (215)	46.1 (242)		
No	233	30.7	10.3 (24)	33.0 (77)	56.7 (132)		
Total	758	100	12.1 (92)	38.5 (292)	49.3 (374)		

<sup>†</sup>Physical activity (PA) recommendations of the ACSM/AHA:  $\geq 150$  minutes of moderate PA at least 5 days a week or  $\geq 60$  minutes of vigorous PA at least 3 days a week; p= significant level;  $\chi^2$ =chi squared.

**Table 2** Sample distribution according to PA recommendations of ACSM/AHA<sup>†</sup> (work-related data). Groups differences according  $\chi^2$  test.

	PA recommendations of ACSM/AHA					Sig (p)	$\chi^2$
	n	%	Sedentary % (n)	Under- exercising % (n)	Exercising % (n)		
Medical speciality group						0.008	20.730
Generalist	89	11.7	19.1 (17)	36.0 (32)	44.9 (40)		
Primary care	249	32.8	8.8 (22)	35.3 (88)	55.8 (139)		
Biomedical	203	26.7	16.3 (33)	40.4 (82)	43.3 (88)		
Medical-surgical	133	17.5	9.8 (13)	36.1 (48)	54.1 (72)		
Surgical	73	9.6	8.2 (6)	52.1 (38)	39.7 (29)		
Total	747	100	12.2 (91)	38.6 (288)	49.3 (368)		
Work sector						0.017	12.034
Private	167	22.0	11.4 (19)	29.3 (49)	59.3 (99)		
Public	329	43.3	10.3 (34)	42.9 (141)	46.8 (154)		
Public and private	263	34.7	14.8 (39)	38.8 (102)	46.4 (122)		
Total	759	100	12.1 (92)	38.5 (292)	49.4 (375)		
Main work setting						0.001	25.413
Primary care center	251	33.0	10.4 (26)	40.2 (101)	49.4 (124)		
Hospital-surgical services	126	16.6	10.3 (13)	47.6 (60)	42.1 (53)		
Hospital-medical services	155	20.4	18.1 (28)	38.7 (60)	43.2 (67)		
Private clinic	117	15.4	9.4 (11)	23.9 (28)	66.7 (78)		
Others	111	14.6	13.5 (15)	38.7 (43)	47.7 (53)		
Total	760	100	12.2	38.4	49.3		

<sup>†</sup> Physical activity (PA) recommendations of the ACSM/AHA:  $\geq 150$  minutes of moderate PA at least 5 days a week or  $\geq 60$  minutes of vigorous PA at least 3 days a week; p= significant level;  $\chi^2$ =chi squared.

**Table 3** Sample distribution according to PA recommendations of ACSM/AHA<sup>†</sup> (lifestyle/health related data). Groups differences according  $\chi^2$  test.

	n	%	PA recommendations of ACSM/AHA <sup>†</sup>			Sig (p)	$\chi^2$
			Sedentary % (n)	Under- exercising % (n)	Exercising % (n)		
Self-perceived health						0.043	6.290
Positive	712	94.1	11.9 (85)	37.8 (269)	50.3 (358)		
Poor	45	5.9	17.8 (8)	51.1 (23)	31.1 (14)		
Total	757	100	12.3 (93)	38.6 (292)	49.1 (372)		
Mental health						0.023	7.573
Positive	618	81.3	12.1 (75)	36.2 (224)	51.6 (319)		
Poor	142	18.7	12.7 (18)	47.9 (68)	39.4 (56)		
Total	760	100	12.2 (93)	38.4 (292)	49.3 (375)		
Body mass index (BMI; Kg/m <sup>2</sup> )						0.000	21.534
Normal-weight (<25)	481	63.5	12.3 (59)	34.1 (164)	53.6 (258)		
Overweight (≥25 - <30)	240	31.7	9.6 (23)	46.3 (111)	44.2 (106)		
Obesity (≥30)	36	4.8	27.8 (10)	44.4 (16)	27.8 (10)		
Total	757	100	12.2 (92)	38.4 (291)	49.4 (374)		
Smoking habits						0.047	9.186
Non-smoker	612	80.5	11.6 (71)	40.0 (245)	48.4 (296)		
Ocasional smoker	58	7.6	6.9 (4)	39.7 (23)	53.4 (31)		
Current smoker	89	11.7	19.1 (17)	27.0 (24)	53.9 (48)		
Total	759	100	12.1 (92)	38.5 (292)	49.4 (375)		
Having leisure time						0.000	74.249
Always	50	6.6	0.0 (0)	16.0 (8)	84.0 (42)		
Almost always	160	21.2	7.5 (12)	29.4 (47)	63.1 (101)		
Sometimes	357	47.3	10.4 (37)	42.0 (150)	47.6 (170)		
Never	187	24.8	23.0 (43)	46.5 (87)	30.5 (57)		
Total	754	100	12.2 (92)	38.7 (292)	49.1 (370)		

<sup>†</sup> PA recommendations of the ACSM/AHA: ≥150minutes of moderate PA at least 5 days a week or ≥60 minutes of vigorous PA at least 3 days a week; p= significant level;  $\chi^2$ =chi squared.

**Table 4** Adjusted Odds ratio (95% CI) associated to Lifestyle Risk Factors (LRF)

		Lifestyle Risk Factors					
Demographic / work-related data	Predictor Variables	Under-exercising ( $\leq 150$ minutes PA/week)		BMI ( $\geq 25$ kg/m <sup>2</sup> )		Under-exercising plus BMI	
		p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)
Gender	Male vs. Female	0.393	1.20 (0.79-1.82)	0.000**	6.47 (4.56-5.75)	0.000**	3.38 (2.31-4.95)
Age	45-56 years vs. 30-44 years	0.002**	0.62 (0.46-0.84)	0.001*	1.79 (1.26-2.55)	0.161	1.43 (0.87-2.37)
Work sector	Public vs. private	0.013*	1.63 (1.11-2.41)	0.954	0.99 (0.62-1.57)	0.425	0.81 (0.48-1.37)
Lifestyle / health related data							
BMI	$\geq 25$ kg/m <sup>2</sup> vs. $\leq 25$ kg/m <sup>2</sup>	<0.001**	1.76 (1.29-2.41)	n.e.	n.e.	n.e.	n.e.
Under-exercising	$\leq 150$ vs. $\geq 150$ min. PA/week	n.e.	n.e.	<0.001**	1.85 (1.31-2.60)	n.e.	n.e.
Smoking habit	Smoker vs. Non-smoker	0.305	0.78 (0.49-1.25)	0.929	1.03 (0.59-1.80)	0.288	0.69 (0.35-1.37)
Chronic Diseases	$\geq 1$ vs. None	0.413	1.17 (0.80-1.70)	0.019*	1.52 (1.07-2.15)	0.520	1.18 (0.71-1.97)
Health status	Poor vs. Positive	0.396	1.44 (0.62-3.34)	0.004**	2.83 (1.39-5.75)	0.000**	3.61 (1.88-6.94)
Mental health status	Poor vs. Positive	0.009**	1.67 (1.14-2.44)	0.788	1.08 (0.62-1.89)	0.301	1.37 (0.75-2.50)

Note: OR=Odds ratio, CI= Confidence interval, ns=Not significant at  $p=0.05$ ; \*significant at  $p \leq 0.05$  \*\*significant at  $p \leq 0.01$ ; n.e.=variable not in the equation. This study included physicians from the Catalonia, Spain, during 2005-2006.