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## ORIGINAL

### ARE TOMORROW'S SPANISH DOCTORS PREPARED TO COMBAT PHYSICAL INACTIVITY?

### ¿ESTÁN PREPARADOS LOS MÉDICOS ESPAÑOLES DEL MAÑANA PARA COMBATIR LA INACTIVIDAD FÍSICA?

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## ABSTRACT

The aim of this study was to evaluate the level of knowledge that Spanish medical students had about current global physical activity (PA) recommendations provided by the World Health Organization (WHO). A total of 334 medical students (2<sup>nd</sup>-6<sup>th</sup> degree years) from 29 Spanish universities completed a questionnaire of knowledge about WHO's global PA recommendations. All respondents (100%) stated that recommending PA is an important part of a physician's role, but only 34.1% felt prepared for it. 85.0% and 72.5% of respondents did not know the PA recommendations for adults and children respectively. Likewise, 94.3% of respondents demanded more education in PA, with an optional/elective subject during the degree, being the preferred method of learning. The lack of knowledge regarding PA recommendations by medical students is evident and alarming. Increasing the education focused on these contents through optional subjects could reverse this situation.

**KEY WORDS:** Exercise; Delivery of Health Care; Noncommunicable Diseases; Curriculum; Medical Education.

## RESUMEN

El objetivo del estudio fue averiguar que conocimientos tenían los estudiantes de medicina españoles sobre las recomendaciones actuales de Actividad Física (AF) de la Organización Mundial de la Salud (OMS). Un total de 334 estudiantes de medicina (2<sup>o</sup>-6<sup>o</sup> curso) de 29 universidades españolas cumplieron un cuestionario de conocimientos sobre las recomendaciones de AF de la OMS. El 100% de los encuestados afirmaron que recomendar AF es una parte importante del trabajo de un médico, pero sólo un 34,1% se sentían preparados para ello. Un 85,0% y un 72,5% desconocían las recomendaciones de AF de la OMS para adultos y niños respectivamente. El 94,3% demandaron una mayor formación académica en AF, siendo el método de preferencia la asignatura optativa. La falta de conocimiento sobre las recomendaciones de AF de los estudiantes de medicina españoles es evidente y alarmante. Aumentar la formación en dichos contenidos mediante asignaturas optativas podría revertir esta situación.

**PALABRAS CLAVE:** Ejercicio; Prestación de asistencia sanitaria; Enfermedades no transmisibles; Currículum; Educación médica.

## INTRODUCTION

Physical inactivity is the 4<sup>th</sup> cause of death in developed countries (1). In spite of the effectiveness of physical activity (PA) to prevent diseases with the highest mortality rates, PA recommendations (according to the World Health Organization (WHO)) were not achieved by 66.8% of the Spanish population (2). Although life expectancy in developed countries is rising, that is different from healthy life expectancy, defined as the number of years a person can be expected to live with complete health (3). In Spain this difference is increasing,

for instance, the percent of healthy life in 2016 was 53.7% and 44.0% for men and women respectively (4). This difference is associated with a decrease in life quality mainly due to functional capacity loss (5). The association between physical inactivity and functional capacity loss is direct (6).

Cardiovascular diseases (CVD) are the most frequent cause of death in developed countries (7). CVD have been found to be associated with several risk factors that in turn will induce the pathology. A variety of risk factors such as physical inactivity, poor nutrition, smoking, hypercholesterolemia, hypertension, diabetes or obesity are associated with an unhealthy lifestyle (8). Physical inactivity has been defined as a main pandemic (9), with several investigations showing that removing physical inactivity would produce a decrease in: general mortality, colon and breast cancer, type II diabetes and up to 26 other diseases (10). This would entail an increase of 0.68 and 0.78 years of life expectancy in the world and Spain respectively (11,12), as well as better quality of life along these years (13,14). PA is a protective factor against non-communicable diseases and their risk factors with the same efficiency or even more than drugs, and therefore can be considered like a poly-pill (15).

Looking at the European Credit Transfer and Accumulation System (ECTS) focused on PA and Health contents in the medical degree of the different Spanish universities, we found that only 2.38% of the overall contents were related to PA and/or exercise (16). This lack of PA education is also evident among other countries such as US (17), Australia (18), Turkey (19) or England (20). Recent research carried out in United Kingdom has demonstrated the lack of knowledge of medical students regarding PA guidelines for health (21,22).

Therefore, the aim of this study was to evaluate Spanish medical students' knowledge about PA guidelines for health.

## **METHODS**

Of the 700 students who attended to XI Medical Education Congress that took place in Zaragoza in 2018, 334 completed the questionnaire. Participants were from several academic years (2<sup>o</sup>- 6<sup>o</sup>) and came from 29 Spanish universities, not only public universities but also private universities, their characteristics are shown in table 1. First academic year students have not been included in the study due to their limited academic background and experience in the medical degree.

**Table 1.** Number of students per university and academic year.

	UNIVERSITY	No.	ACADEMIC YEAR				
			2º	3º	4º	5º	6º
<b>PUBLIC</b>	Universidad de Extremadura	17	3			4	10
	Universidad Autónoma de Barcelona	2			2		
	Universidad Autónoma de Madrid	4					4
	Universidad Castilla la Mancha	2				2	
	Universidad Complutense de Madrid	6		2	3	1	
	Universidad de Alcalá	3	1	2			
	Universidad de Cantabria	25	6	7	7	3	2
	Universidad de Córdoba	12			4	8	
	Universidad de Girona	3		1			2
	Universidad de La Laguna	5		4	1		
	Universidad de Lérida	2	2				
	Universidad de Málaga	6	1		1	3	1
	Universidad de Murcia	70	32	13	6	13	6
	Universidad de Salamanca	19	5	1	6	7	
	Universidad de Santiago de Compostela	1	1				
	Universidad de Sevilla	3		2		1	
	Universidad de Valencia	5		1	3		1
	Universidad de Valladolid	21	3		4	14	
	Universidad de Zaragoza	61	14	4	4	27	12
	Universidad del País Vasco	7	6				1
Universidad Jaume I	1	1					
Universidad Rey Juan Carlos	24		1	15	2	6	
<b>PRIVATE</b>	Universidad Católica de Murcia	4			1	3	
	Universidad CEU Cardenal Herrera	21			4	15	2
	Universidad de Navarra	1			1		
<b>UNIVERSITY NON REPORTED</b>		9	2		2	3	2
<b>TOTAL PUBLIC UNIVERSITY</b>		299	75	38	56	85	45
<b>TOTAL PRIVATE UNIVERSITY</b>		26	0	0	6	18	2
<b>TOTAL</b>		334	77	38	64	106	49

All the participants completed a PA recommendation knowledge questionnaire focused on current PA recommendations for health from the WHO. This questionnaire was used by Osborne *et al.* in the University of Edinburgh. The translated questionnaire used in the present study is presented in supplement 1 (Physical Activity for Health Questionnaire).

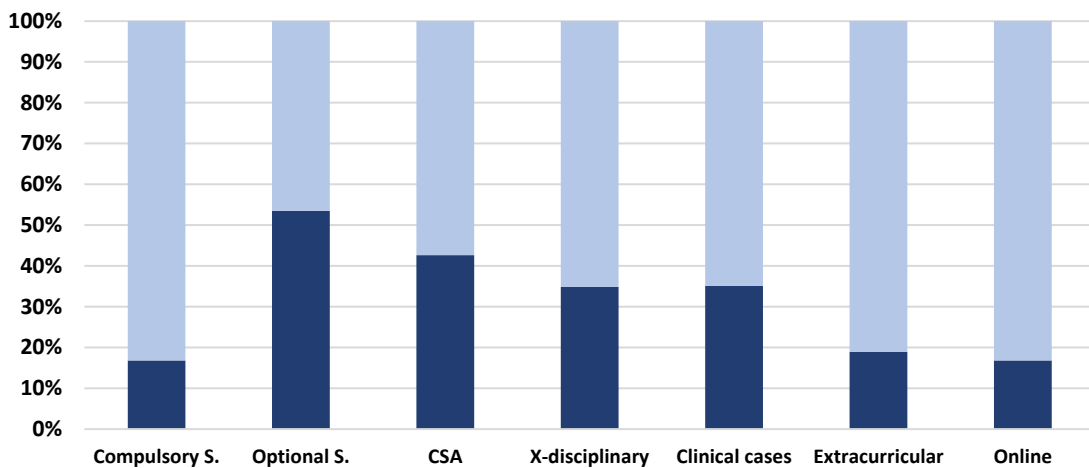
Statistical analyses were based on answer frequencies which were calculated for the overall sample and stratifying by academic years. T-tests for independent samples were performed in order to verify if differences of knowledge were found between groups divided according to self-perceived preparation of the participants to give good advice on PA.

## RESULTS

### OVERALL SAMPLE:

All the students who completed the questionnaire strongly agreed (83.8%) or agreed (16.2%) with the idea that counseling PA to their patients is an important function of the physicians. Moreover, 34.1% asserted to feel prepared to advice PA to the population, while a 65.9% did not feel prepared.

On the other hand 94.3% of 334 participants expressed that they would like more PA academic training, with contents regarding epidemiology, health benefits, promotion and exercise prescription. When students were asked about how they would like to obtain PA related knowledge, the preferred sources were compulsory subjects (16.8%) or optional subjects (53.5%) during the degree, curricular supplementary activities (42.6%), cross-disciplinary content in other subjects (34.8%), clinical cases in other subjects (35.1%), extracurricular classroom courses (18.9%), and extracurricular online courses (16.8%) (figure 1).

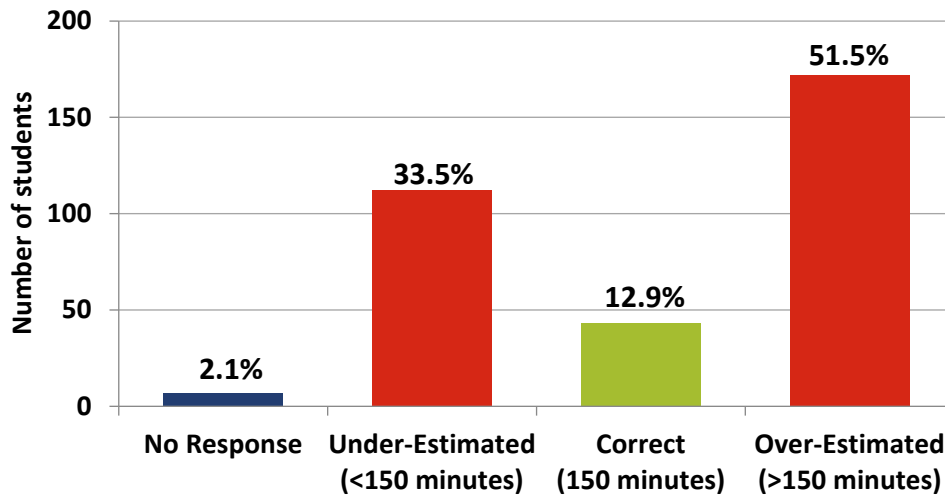


**Figure 1.** Teaching methods demanded by Spanish medical students to receive greater preparation in contents related to physical activity for health.

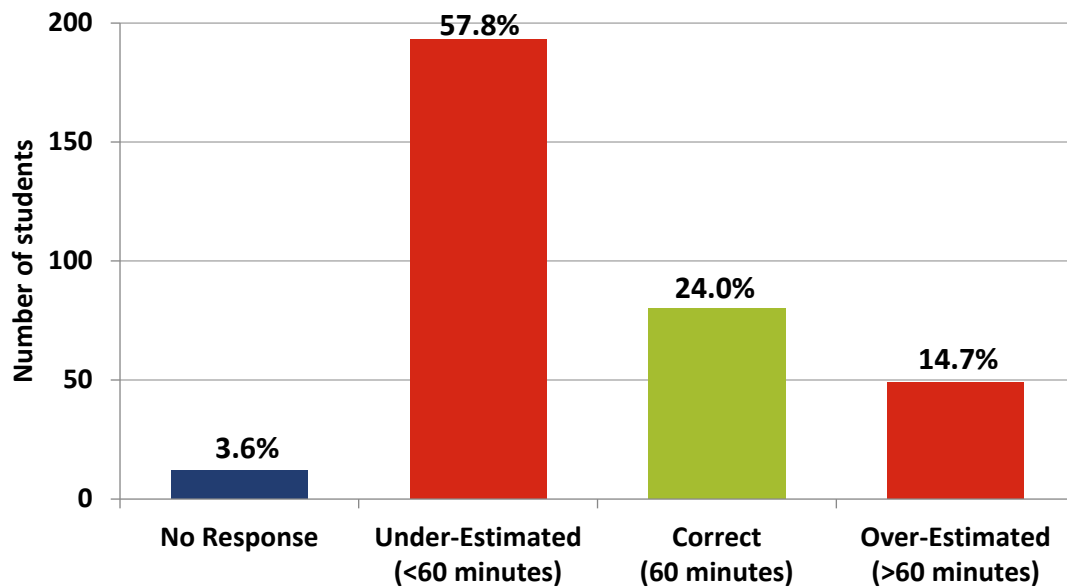
*Abbreviations: Compulsory S.= Compulsory subjects; Optional S. = Optional subjects; CSA= Curricular supplementary activities; X-disciplinary= Cross-disciplinary content in other subjects; Clinical cases= Clinical cases in other subjects; Extracurricular= Extracurricular classroom course; Online= Extracurricular online course.*

In relation to the participants' knowledge about PA recommendations, 85.0% of the respondents gave a wrong answer to the question "How many minutes of moderate physical activity (MPA) should adults accumulate, as a minimum, over one week" (underestimating or overestimating the value), 2.1% did not respond, and 12.9% gave a right answer (figure 2). Regarding moderate to vigorous physical activity (MVPA), 72.5% of the respondents answered wrongly to the question "How many minutes of MVPA should children and young people engage in every day" (underestimating or overestimating the value), 3.6% did not respond, and 24.0% gave a right answer (figure 3). In the same line, 65.9% of the respondents gave a wrong answer to both previous questions, 31.4% of

the respondents gave a right answer to one of both previous questions, and 2.7% answered correctly to both questions.

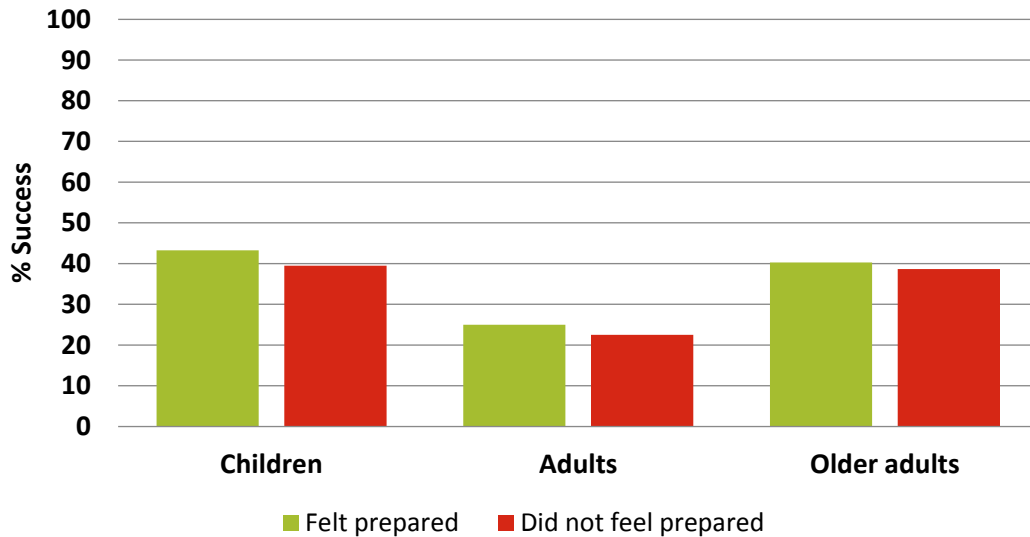


**Figure 2.** Frequency of answers to the question: How many minutes of moderate intensity physical activity should adults accumulate over one week?



**Figure 3.** Frequency of answers to the question: How many minutes of moderate to vigorous physical activity should children and young people engage in every day?

No significant differences were found regarding participants' PA recommendations knowledge for the different age groups when comparing participants based on self-perceived preparation to give a good advice on PA ( $p > 0.05$ ), figure 4.



**Figure 4.** Percentage of success on the global recommendations of physical activity for each age group divided according to the self-perceived preparation of the participants to give good advice on physical activity.

## LAST ACADEMIC YEARS STUDENTS

Of the overall sample, 219 were 4<sup>o</sup>, 5<sup>o</sup> or 6<sup>o</sup> degree students. All respondents strongly agreed (87.7%) or agreed (12.3%) with the idea that counseling PA to their patients is an important function of the physicians. As long as 37.3% asserted to feel prepared to advice PA to the population, while 62.7% did not feel prepared enough. In relation to the participants' knowledge about PA recommendations, 81.7% of the respondents gave a wrong answer to the question "How many minutes of MPA should adults accumulate over one week" (underestimating or overestimating the value), 1.4% did not respond, and 16.9% gave a right answer. Regarding the recommendations for children and young people, 70.8% of the respondents gave a wrong answer to the question "How many minutes of MVPA should children and young people engage in every day" (underestimating or overestimating the value), 3.2% did not respond, and 26.0% gave a right answer.

## DISCUSSION

The success of a good treatment is based on a correct diagnosis. Without identifying inactive subjects, it will be difficult to act on this behavioral anomaly.

All respondents agreed with the idea that counseling PA to their patients is an important function of the physicians. Despite the fact that approximately one third of respondents felt prepared to counseling PA to general population, 97.3% did not know the PA guidelines provided by the WHO. This research demonstrates that, for medical students, the curricular contents related to PA and health in their degree are insufficient. Spanish students demand greater academic training in that field (94.3% of respondents), being the optional subject the most demanded teaching method.

This problem does not only take place in Spain, the same trend is observed worldwide. Similar results were found in our study and in the study developed by Osborne *et al.* in the University of Edinburgh regarding PA recommendations knowledge in adults (85.1% and 85.0% respectively did not answer correctly) and children (75.7% vs. 72.5% respectively did not answer correctly)(22). In the same line, another study carried out in Scotland also highlights the lack of knowledge regarding PA recommendations for general population among medical students of two universities (21).

This serious knowledge gap demonstrated by medical students (21,22), is present in the current health system, as indicated by Wheeler *et al.*, who showed that physicians, nurses and other health workers do not show an adequate level of knowledge regarding PA recommendations for general population and do not know the benefits of leading an active life (23). At this point, it must be asked if the health system complied with *Lex artis ad hoc*, looking at the irrefutable evidence in favor of PA (15), medical practice can be clearly improved. It is acknowledged that general physicians must not be experts in exercise prescription, but they should have enough knowledge regarding PA so that they can give good advice to their patients (24), thus complying with *Lex artis ad hoc*. If a more efficient and sustainable health system is aspired, the inclusion of PA recommendations and exercise prescription in healthcare services should be considered.

Globally the medical schools' curricula barely include content related to PA and health, and those which include it, do it unsatisfactorily (16–20). This is a problem that must be solved by providing PA and health learning, not only to medical students, but also to all students that will soon become part of the health system (25). The preferred teaching method to learn about PA and health is different among studies, with previous studies showing the workshop as the preferred method (22), while participants of our study preferred an optional subject within the medical degree. In spite of these discrepancies, what seems obvious is that increasing the number of ECTS and the contents related to the prevention and treatment of chronic diseases through PA and exercise in undergraduate and postgraduate courses might favor a greater promotion of health related PA by physicians and health workers. This would cause an increase in PA levels of the population and a decrease of healthcare expenditure (25,26). A recent study carried out in Turkey shows more training in PA and health can help future physicians to believe in the role of PA and exercise in health, and their capacity to give a good PA advise to their patients (19).

The main strength of the study is that it analyzes for the first time the Spanish medical students' knowledge about global recommendations on PA from 29 different universities (public and private) throughout the country. Sample size and its heterogeneity are elements that must be taken into account in the interpretation of the results.



## CONCLUSIONS

Based on the obtained results, it can be concluded that most of the medical students evaluated in this study ignore the PA recommendations provided by the WHO. Training in this area should be improved through optional subjects or curricular supplementary activities.

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