

Level of Physical Activity and Knowledge about the Physical Activity Guidelines in a Group of Medical Residents from Puerto Rico

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Objective: Physicians who know about physical activity guidelines (PAG) and those who adhere to the PAG themselves may have a greater tendency to recommend physical activity (PA) to their patients. This study was aimed at evaluating the level of PA in a group of medical residents from Puerto Rico and to assess their knowledge regarding the PAG for adults.

Methods: A total of 104 medical residents from Puerto Rico completed a self-administered questionnaire designed to obtain standardized estimates of their PA and to determine their level of knowledge regarding the PAG.

Results: Most of the medical residents (66.3%) declared that they did not have any knowledge of the existence of the PAG and that their residency programs had not provided any educational activities about the PAG (96.2%). The level of inactivity among medical residents was high; 41.35% reported not engaging in any PA during their leisure time.

Conclusion: Most of the medical residents in this group from Puerto Rico did not know about the PAG and many of them did not engage in PA. As a means of improving patient care, medical residents from Puerto Rico might benefit if their programs implemented educational activities aimed at increasing knowledge of both PA and the PAG. [*P R Health Sci J* 2019;38:226-230]

Key words: Exercise, Physicians, Puerto Rico, IPAQ

There is an increasing amount of evidence about the health benefits of physical activity (PA) and its contribution to an individual's overall wellbeing. Specifically, there are studies showing the favorable effects of exercise on several common chronic conditions, such as high blood pressure, high total cholesterol levels, high low-density lipoprotein cholesterol levels (1, 2), and diabetes mellitus (3).

Although the benefits of PA are documented in the literature, several studies suggest that physicians might not counseling their patients about these advantages to an appropriate extent (3–6), as the frequency of physicians recommending PA to their patients is low, overall (4). For instance, in a study from VanWormer et al, most patients (60%) with a high risk for cardiovascular disease did not receive counseling regarding PA during their most recent medical visit (5). In another study, this one by Lobelo and his coworkers, only 34% of the adults in the United States (US) reported having received counseling about exercise during their most recent medical visit (7).

A reason why physicians might not be advising their patients sufficiently regarding PA could be because of a global lack of knowledge about the topic. In a study by Chatterjee and his collaborators, 80% of the general practitioners in England were unfamiliar with the national guidelines for PA (6). Similarly, in a study in Brazil, 80% of the participating physicians reported

needing more information about guidelines for PA (8). There is little specific data, if any, regarding the level of knowledge that US physicians have about the specific quantity of PA that they need to be recommending to their patients.

In addition to lack of knowledge, other common barriers to counseling about PA are inadequate time and little experience with exercise (9). Clinicians could be failing to advise their patients about the benefits of PA because they are physically

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inactive themselves. Regarding this topic, low levels of PA have been documented among healthcare workers (10). In a study in Northern Ireland, physical inactivity among physicians was found to be high, although lower than in the general population (43.4% vs. 56.2%, respectively) (11). Assessing the level of PA in physicians and other healthcare workers is important because some investigators have found a positive association between healthcare workers' PA habits and the frequency of counseling about exercise (12). Physicians who regularly engage in aerobic exercise or strength training are more likely to give advice to their patients regarding the benefits of these exercises (9).

The previous facts suggest that in order to prospectively increase the frequency of patients that are counseled by their physicians about exercise, it would be beneficial to increase the level of PA among physicians and, most importantly, among physicians in training. However, studies show that, globally, PA is low not only in physicians but also in medical students (13) and medical residents (14–17). Increasing the level of PA in physicians in training might, in the future, lead to incremental increases in the frequency of patients being counseled about PA; a plan of action for doing so in teaching centers might be warranted now.

In 1995, the Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) issued national guidelines on PA (18). These guidelines were endorsed by the American Heart Association (AHA) and later revised in 2007 for further clarification (18). One year later, the US Department of Health and Human Services issued the 2008 Physical Activity Guidelines (PAG) for Americans (19). The PAG for adults encompasses a series of recommendations. These recommendations advocate performing 2 hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity (including brisk walking) every week. In addition to aerobic activity, muscle-strengthening activities that work all the major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) should be performed on 2 or more days, weekly. An alternate regimen consists of 1 hour and 15 minutes (75 minutes) of vigorous-intensity aerobic activity every week (which could be jogging or running), while also carrying out a muscle-strengthening routine 2 or more days a week. The final regimen mentioned in the guidelines is a mix of moderate-intensity and vigorous-intensity aerobic activity accompanied by muscle-strengthening activities on 2 or more days a week. The second edition of the PAG, released in 2018, has not changed the amount of PA recommended (20).

Although following the PAG would improve a given individual's health, the level of inactivity in the US remains high nationwide. According to the CDC, only 50.9% of all adults meet the 2008 PAG (at least 150 minutes a week of moderate-intensity PA or 75 minutes a week of vigorous aerobic activity), while 24.2% have reported not engaging in any leisure-time PA (21). Men in the US are more likely to meet the recommendations for aerobic activity than US women (51.9%

vs. 50.1%) (21). In Puerto Rico, the most recent data available (from 2016) show that the level of inactivity in adults is one of the highest nationwide (among the 50 states, Washington DC, and the remaining territories): 41.7% of adults reported that they had engaged in no leisure-time PA during the previous month (21).

These alarming facts show that, in order to develop effective strategies for education on lifestyle modification, it is imperative to understand why patients are not receiving counseling regarding the PAG for adults. Therefore, this study was aimed at evaluating the level of PA in a group of medical residents from Puerto Rico and to assess their knowledge about the PAG for adults. We hypothesized that inactivity was high and knowledge about the PAG was poor in this group of physicians.

Methods

Medical residents from 21 to 65 years of age who were affiliated with medical or surgical residency and fellowship programs at the University of Puerto Rico, Medical Sciences Campus (UPR-MSC), were invited to participate in the study during educational activities or morning reports in April and May, 2011. The medical residents received a document with information about the study and a consent form. If they agreed to participate, they were asked to complete a self-administered survey consisting of the validated International Physical Activity Questionnaire (IPAQ) (22) and a Knowledge Assessment Questionnaire (KAQ) (Figure 1). The exclusion criteria included not being a medical resident in the UPR-MSC system, being younger than 21 years old (because 21 is the age of majority in Puerto Rico) or older than 65 years old, and self-reporting being too physically impaired to exercise.

UPR-MSC has a long tradition of post-graduate training in medical and surgical specialties and subspecialties. It sponsors 38 residency and fellowship programs accredited by the Accreditation Committee of Graduate Medical Education (ACGME), with 432 residents and fellows spread among the University District Hospital (UDH), the University Pediatric Hospital (UPH), and the University of Puerto Rico Hospital in Carolina.

The IPAQ is a publicly available questionnaire that is used to obtain standardized estimates of PA that can be compared at the international level (22). For this project, the long, last 7 days, self-administered version of the IPAQ (revised on October 2002) was employed. As medical residents at UPR-MSC are fluent in both English and Spanish, we used the English version of the IPAQ. The IPAQ assesses PA performed across a comprehensive set of domains: leisure time PA, domestic and gardening activities, work-related activity, and transportation-related activity. In the short IPAQ, the questions are focused on walking, moderate-intensity activities, and vigorous-intensity activities. The scores are computed by adding up the scores from all the questions, taking into account the duration (in minutes) and frequency (in days) of a given activity.

Testing the extent of knowledge on Physical Activity Guidelines

- Sex: F M
- Age: _____
- Residency Program:

<input type="checkbox"/> Anesthesiology (1)	<input type="checkbox"/> Dermatology (10)
<input type="checkbox"/> Internal Medicine (2)	<input type="checkbox"/> Pediatrics (11)
<input type="checkbox"/> General Surgery (3)	<input type="checkbox"/> Neurosurgery (12)
<input type="checkbox"/> ENT (Ear/Nose/Throat) (4)	<input type="checkbox"/> Ophthalmology (13)
<input type="checkbox"/> Urology (5)	<input type="checkbox"/> Dermatology (14)
<input type="checkbox"/> Emergency Medicine (6)	<input type="checkbox"/> Family Medicine (15)
<input type="checkbox"/> PM&R (7)	<input type="checkbox"/> Obstetrics and Gynecology (16)
<input type="checkbox"/> Pathology (8)	<input type="checkbox"/> Neurology (17)
<input type="checkbox"/> Psychiatry (9)	
- Residency Level:

a. I <input type="checkbox"/>	e. V <input type="checkbox"/>
b. II <input type="checkbox"/>	f. VI <input type="checkbox"/>
c. III <input type="checkbox"/>	g. VI <input type="checkbox"/>
d. IV <input type="checkbox"/>	h. VIII or more <input type="checkbox"/>
- Did you know there are established Physical Activity Guidelines?
YES NO
- Has this topic been described as an educational activity in your residency program?
YES NO
- Did you know adults 18-65yers old need at least 150 minutes/week of moderate – intense or 75 minutes/week of vigorous/intense activity?
YES NO
- Did you know aerobic activity should be done on at least 10 minutes episodes?
YES NO
- Did you know that for additional benefit you may increase aerobic exercise to 300 minutes/week?
YES NO
- Did you know that for additional benefit adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week?
YES NO

Figure 1. Knowledge Assessment Questionnaire

The KAQ was designed by the investigators for this study to determine if the medical residents had any knowledge of the PAG. This appraisal included questions to determine each participant’s sex, age, residency program, and residency level and questions concerning knowledge of the PAG for adults. The KAG also included a closed question to determine whether the topic of the PAG for adults had been discussed in a resident educational activity (Figure 1).

Univariate statistics were computed, including, mainly, frequencies, percentages, and mean and standard deviation to describe the medical-resident population. Also, a correlation analysis was computed to assess significance among continuous variables from the demographic data and the sub-scales from the questionnaires, and other bivariate and trivariate analyses were computed to assess differences between variables. The Statistical Package for the Social Sciences (SPSS, v.18) was used for all the analyses. This project was approved by the Institutional Review Board (IRB) of UPR-MSU.

Results

A total of 104 medical residents from UPR-MSU who reported not having any medical condition preventing them from exercising completed the questionnaires. Of the sample group, 51% were female physicians and 62.5% were younger than 30 years. Most of the residents in the sample were from the 1st, 2nd and 3rd post-graduate years (25%, 21.2%, and 24%, respectively), but post-graduate years 4, 5, and 6 were also represented (19.2%, 8.7%, and 1.9%, respectively) (Table 1). When questioned about the PAG for adults, most of the participating residents (66.3%) claimed to be unaware of the existence of the PAG and most (96.2%) said that their residency programs had not provided any educational activities concerning the PAG (Table 2).

Table 1. Characteristics of physicians surveyed (n = 104)

Sociodemographic	Frequency (%)
Gender	
Male	51 (49%)
Female	53 (51%)
Age (years)	
<30	65 (62.5%)
30–40	34 (32.7%)
>40	5 (5%)
Level of training	
PGY1	26 (25%)
PGY2	22 (21.2%)
PGY3	25 (24%)
PGY4	20 (19.2%)
PGY5	9 (8.7%)
PGY6	2 (1.9%)

Table 2. Knowledge about the PAG among surveyed residents (n = 104)

Knowledge of the PAG for adults	Frequency (%)
<i>Did you know there are established physical activity guidelines for adults?</i>	
Yes	34 (32.7%)
No	69 (66.3%)
No answer	1 (1%)
<i>Has this topic been covered in an educational activity in your residency program?</i>	
Yes	4 (3.8%)
No	100 (96.2%)

Male residents in our sample were more likely to report performing PA than their female counterparts were (67% vs. 47%). Likewise, of the medical residents who knew about the PAG for adults, the majority (58.82%) reported performing some PA. From the 3.8% of medical residents that had participated in educational activities on the topic of the PAG for adults (n = 4), 50% reported performing some PA. When the 104 medical residents were asked about their PA during leisure time, 58.63% reported some PA. The different forms

of PA performed by those who engaged in some PA during their leisure time included walking (43.3%), moderate exercise (25%), and vigorous exercise (37.5%) (Table 3).

Trivariate analysis showed a trend of association between men who knew about the PAG for adults and participation in vigorous PA ($p = 0.054$). There was also a significant negative association in men between increasing levels of training and vigorous PA ($p = 0.03$) (data not shown).

Table 3. Physical activity among medical residents ($n = 104$)

Physical activity	Frequency (%)
<i>Engaged in physical activity (by gender)</i>	
Male	34 (67%)
Female	25 (47%)
<i>Amount of physical activity in residents who knew about the PAG for adults ($n = 34$)</i>	
Some activity	20 (58.82%)
No activity	14 (41.17%)
<i>Amount of physical activity during leisure time ($n = 104$)</i>	
Some activity	61 (58.63%)
No activity	43 (41.35%)
<i>Type of activity ($n = 104$) (participants could select more than 1)</i>	
Walking	45 (43.3%)
Moderate	26 (25%)
Vigorous	39 (37.5%)
<i>Amount of physical activity in those who had learned of the PAG for adults at an educational activity ($n = 4$)</i>	
Some activity	2 (50%)
No activity	2 (50%)

Discussion

A considerable number of the residents in the sample (41.3%) did not perform any PA in their leisure time. Since other investigators have found that physicians who practice aerobic exercise regularly are more likely to counsel their patients on the benefits of exercises (9), patients under the care of the participating residents from Puerto Rico might not be receiving enough counseling about the PAG.

Other studies suggest that there are low levels of PA among medical residents in the US (not including Puerto Rico) (16, 17, 23, 24). However, low levels of PA among young physicians do not seem to occur exclusively in Puerto Rico and the rest of the US. A recent study (similar to ours and using the IPAQ) of medical residents in Saudi Arabia showed that 68.4% of the participants had low levels of PA (≤ 600 -MET min/week) (15).

In our study, men were more likely to meet the PAG recommendations than women were (67% vs. 47%). These results are similar to the findings from surveillance data, nationwide (21). The medical residents surveyed in our study reported a higher level of physical inactivity (41.35%) than was reported by the CDC with regard to the nation's general population (24.2%) (21), but that same level of inactivity among

the medical residents in our study (41.35%) is comparable to the inactivity reported for the general population of Puerto Rico in the CDC prevalence and trends data (41.7%) (21).

Male medical residents at higher levels of training in our population were less likely to engage in vigorous PA than their counterparts below them ($p = 0.03$). We theorize that this might be secondary to increasing levels of responsibility during residency programs, busier schedules, the practice of moonlighting, increasing biological age, or any combination of two or more of the previous, but further studies in this area would be beneficial.

It is important to note that the great majority of residents in this study (96.2%) reported not having participated in any kind of educational activity regarding the PAG. This compares with other studies in the literature that report that less than 15% of the medical residents agreed that they had received adequate training in exercise counseling (25) and that only a low proportion of physicians felt confident in their ability to prescribe exercise for patients (26).

In our study, most of the medical residents who had previous knowledge of the PAG for adults engaged in some PA. There was also a trend association between male medical residents who knew about the PAG for adults and their participation in vigorous PA. These findings suggest that knowledge about the PAG might also contribute to the health of the physicians because they might be more likely to adhere to the PAG themselves. However, given that knowledge about the PAG in our study population was low, overall, a plan of action may be warranted. As a means of improving patient care, medical residents from Puerto Rico might benefit if their programs implemented educational activities aimed at increasing knowledge of both PA and the PAG.

There are few studies in the US (including Puerto Rico) regarding levels of PA and knowledge of the PAG among medical residents, making the findings of this study relevant. Nevertheless, there are some limitations. As we surveyed only medical residents affiliated with UPR-MSU, conclusions might not be generalizable to all the medical residents from Puerto Rico. In addition, due to the relatively small size of our sample, we could not determine whether residents in medical residency programs differed from residents in surgical residency programs in terms of their levels of PA and knowledge of the PAG. It would also be beneficial to increase the sample size and to assess for possible confounders. Further studies in this population of young physicians are necessary in order to increase our understanding and design innovative strategies.

Resumen

Objetivo: Los médicos que conocen sobre las guías de actividad física (AF) y aquellos que las siguen en su propia vida tienen una tendencia mayor a recomendarle AF a sus pacientes. Este estudio quería evaluar el nivel de AF en un grupo de médicos residentes de Puerto Rico y medir el conocimiento que

ellos tienen sobre de las guías de AF en adultos. Metodología: En total, 104 médicos residentes de Puerto Rico contestaron un cuestionario auto-administrado diseñado para obtener un estimado de su AF y para determinar su conocimiento acerca de las guías de AF. Resultados: La mayoría de los residentes contestó que no conocen sobre la existencia de guías de AF (66.3%) y que sus programas de residencia no les habían brindado ninguna actividad educativa sobre las guías de AF (96.2%). El nivel de inactividad entre estos médicos residentes fue alto, ya que el 41.35% de ellos reportó no hacer ninguna AF durante su tiempo libre. Conclusiones: La mayor parte de este grupo de médicos residentes de Puerto Rico no conocía sobre las guías de AF y muchos de ellos no hacían AF en su tiempo libre. Para mejorar el cuidado al paciente, los médicos residentes de Puerto Rico se beneficiarían si sus programas implementaran actividades didácticas destinadas a educarles sobre las guías de AF.

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