



Physicians', nurses' and community health workers' knowledge about physical activity in Brazil: A cross-sectional study☆

Laura Burdick^a, Gregore I. Mielke^a, Diana C. Parra^{b,c,*}, Grace Gomes^d, Alex Florindo^e, Mario Bracco^{f,g}, Felipe Lobelo^h, Eduardo J. Simoesⁱ, Michael Pratt^j, Luiz R. Ramos^k, Lenildo Moura^l, Ross C. Brownson^m, Pedro C. Hallal^a

^a Federal University of Pelotas, Postgraduate Program in Epidemiology, Pelotas, Brazil

^b Washington University in St. Louis, School of Medicine, Program in Physical Therapy, St. Louis, MO, USA

^c Gerontology Department, Federal University of Sao Carlos, São Carlos, SP, Brazil

^d School of Arts, Sciences and Humanities, University of Sao Paulo, Sao Paulo, Brazil

^e Hospital Israelita Albert Einstein, São Paulo, SP, Brazil

^f Hospital Municipal Dr. Moyses Deutsch, M'Boi Mirim, São Paulo, Brazil

^g Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA, USA

^h University of Missouri, School of Medicine, Department of Health Management and Informatics, USA

ⁱ Global Health Promotion Office, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

^j Department of Preventive Medicine, Federal University of Sao Paulo, São Paulo, SP, Brazil

^k Non-communicable Diseases Coordination and Field Epidemiology Training Program EPISUS, Health Surveillance Secretariat, Ministry of Health, Brasilia, Brazil

^l Washington University in St. Louis, Brown School, Prevention Research Center in St. Louis, St. Louis, MO, USA

^m Washington University in St. Louis, School of Medicine, Division of Public Health Sciences, Alvin J. Siteman Cancer Center, St. Louis, MO, USA

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ABSTRACT

Objectives. To measure knowledge of current recommendations of physical activity and consequences of physical inactivity among healthcare providers throughout Brazil.

Methods. A phone survey of 1600 randomly selected primary healthcare units in Brazil was conducted between January and July 2011. At each unit, a physician, nurse or community healthcare worker ($n = 798$) responded to a 40-minute survey, eliciting information about demographics, knowledge, and health behaviors pertaining to physical activity.

Results. Among nurses and community healthcare workers, >95% reported needing more information on physical activity guidelines. Among physicians this proportion was 80%. Nearly 40% of the professionals incorrectly believed 90-min of moderate-intensity physical activity per week is the recommended amount for health benefits; nearly 30% believed that 90-min of vigorous-intensity activity per week is needed for the same purpose. More than 75% of all groups reported that type II diabetes, hypertension, depression, and coronary heart disease might result from physical inactivity, but on average only 60% from each group are aware of osteoporosis as a possible consequence of physical inactivity.

Conclusions. Training health professionals in how to convey all relevant information about physical activity to their patients is critical for health promotion within the primary care system in Brazil.

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Introduction

Participation in recommended amounts of physical activity (PA) is an integral part of disease prevention and health promotion (Anon., 1996; U.S. Department of Health and Human Services, 1996; Hallal et al., 2012). However, one-third of adults and four-fifths of adolescents

worldwide do not achieve public health PA goals (Hallal et al., 2012). PA reduces the risk of coronary heart disease, diabetes, colon cancer, hypertension, and obesity (Anon., 1996; U.S. Department of Health and Human Services, 1996, 2011; Lee et al., 2012). People often obtain information about physical activity and other health habits from their physician, nurses, and community healthcare workers (Glasgow et al., 2001; Honda, 2004; Kreuter et al., 1997; Nawaz et al., 2000). Of 1818 U.S. adults whom reported seeing a physician in the past year, 28% received advice to increase PA level (Glasgow et al., 2001). These patients were likely to be white and already have been diagnosed with chronic illness. In several cross-sectional studies from the United States and United

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* Corresponding author at: Washington University in St. Louis, Program in Physical Therapy, 8150 Whitburn Dr 2 W, St. Louis, MO 63105, USA. Fax: +1 314 935 0150.

E-mail address: Dparrape34@gmail.com (D.C. Parra).

Kingdom, less than 40% of patients who have seen a healthcare provider in the last year report that they did not receive counseling on PA (Glasgow et al., 2001; Honda, 2004; Kreuter et al., 1997; Nawaz et al., 2000; Wee et al., 1999). A survey in Brazil completed by 4060 adults and 4003 elderly individuals indicated that adults believe a healthy diet (33.8%) and regular exercise (21.4%) are the two most important factors relevant to their health, while elderly indicated a healthy diet (36.7%) and not smoking (17.7%) were the two most relevant factors (Siqueira et al., 2009b). From this survey, only 28.9% of adults and 38.9% of elderly reported receiving counseling for PA (Siqueira et al., 2009a).

Academic and scientific groups have been developing and frequently revising guidelines and recommendations for health promotion behaviors. For instance, current recommendations from the Center for Disease Control and Prevention (CDC) for physical activity among adults include 150 min of moderate-intensity activity, or 75 min of vigorous-intensity activity, per week and two or more days a week of muscle-strengthening activities (U.S. Department of Health and Human Services, 1996, 2011). The World Health Organization (WHO) concurs with muscle-strengthening activities two days per week, but sets out different recommendations for three age groups: 5–17 years, 18–64 years, and over 65 years. WHO recommends 150 min of moderate-intensity activity in which the duration is at least 10 min each time but only for those 18–64 years of age. They also recommend increased benefits from more moderate intensity and incorporation of vigorous-intensity PA (Anon., 2010). Previously, guidelines placed emphasis on the number of recommended days per week of physical activity (five days of moderate-intensity or three days of vigorous intensity) (Anon., 2010; Blair et al., 2004), while current guidelines refer to minutes per week. The previous recommendation was five days of moderate-intensity or three days of vigorous-intensity. As these recommendations change or become more complex, healthcare providers must stay knowledgeable and aware of general PA recommendation for discussions, counseling, and plan creation with their patients.

This article evaluates the knowledge of current recommendations among physicians, nurses and community healthcare workers in Brazil, as well as the diseases they think can be caused by physical inactivity. It also evaluates the differences in the knowledge among these categories of professionals, namely physicians, nurses, and community healthcare workers.

Methods

A cross-sectional study was conducted in primary health care units in Brazil as part of Project GUIA (Guide for Useful Interventions in Brazil and Latin America) (Pratt et al., 2010). The Sistema Único de Saúde (SUS), or the National Public Health System of Brazil, is a decentralized program whose responsibility for healthcare delivery and programs lies within the local level. SUS includes 65,000 outpatient clinics with both primary and secondary care units. Each state and municipal health department is responsible for conducting their own disease surveillance and reporting (Paim et al., 2011). This study was conducted through the use of phone interviews including proportional allocation of contacts throughout the twenty-seven states of Brazil.

The sample size of the present study, considered 50% of professionals with positive answer to each outcome of interest, 95% confidence level and 5 perceptual points of confidence limits. Thus, we would need a sample of 381 professionals in each category (physician, nurse and community health worker). The sample was inflated by 10% due to loss and refusal, totaling a required sample of 419 professionals in each category. Due to the multi-purpose characteristic of this study, we randomly sampled 1600 units out of 42,486 primary care units in Brazil, selecting 534 physicians, 533 nurses, and 533 community healthcare workers.

Each phone call included interviewing the health coordinator at each unit as well as a physician, nurse or community healthcare worker. Before each call was placed, it was determined which professional was to

be interviewed at each location. For example, in unit 1 we interviewed the coordinator and a physician; in unit 2 we interviewed the coordinator and a nurse, and the coordinator and a community healthcare worker in unit 3. In each unit only one professional was selected. When there was more than one target professional working (e.g. there were units with 2 physicians/nurses/community healthcare workers), a list of all professionals was given by the coordinator and a random sample was obtained. Thus, the individual interviewed at each location was randomly selected to be interviewed, despite their professional category. The individual interviewed at each location, despite of their professional category, was randomly selected for the interview. There were not any exclusion criteria as only eligible primary care units in Brazil were contacted to collect data. We did not analyze data collected from health coordinators of the units in this paper.

Data collecting was carried out between January and July 2011. Six research assistants from the Federal University of Pelotas conducted the survey. Each interviewer called the randomly chosen primary care unit and interviewed a coordinator and a professional, each survey lasting approximately 40 min. Sex, age, race, marital status, height, weight, and self-reported general health status were recorded for each interviewee. Dependent variables included multiple-choice and open-ended self-reported questions about current recommendations for physical activity (vigorous and moderate), fruit and vegetable consumption, recommended waist circumference and body mass index, as well as knowledge about diseases caused by a physically inactive lifestyle.

All collected data were entered into EPIdata to check for consistency and missing values. Current recommendations for moderate-intensity PA and vigorous-intensity PA are based on minutes per week. Professionals were asked to report their knowledge of physical activity using both days per week and minutes per active day. Total minutes per week were calculated using days and minutes reported. This was done to compare with current recommendations, which reflects minutes per week (Anon., 2010; U.S. Department of Health and Human Services, 2011; Blair et al., 2004). We calculated relative frequencies of responses across the three groups of professionals. All analyses were conducted using software Stata, 11.0. Graphs 1 to 4 depict frequencies or percentages of responses for questions measuring knowledge of physical activity and current recommendations. The Research Ethics Committee of the Federal University of Pelotas and Washington University in St. Louis approved this study.

Results

A total of 798 healthcare professionals were interviewed and included in this study. After the interview and excluding those with missing data, the final response rates were as follows: 182/534 (34.1%) physicians, 347/533 (65.1%) nurses, and 269/533 (50.5%) community healthcare workers. Demographic characteristics varied across the three professional groups: physicians, nurses, and community healthcare workers (Table 1). Physician interviewees were predominantly male (56.6%) whereas the other two were mainly female: nurses (84.7%) and community healthcare workers (89.2%). Overall, 70% of those interviewed were between the ages of 20 to 39 with less than 3% being older than sixty years. Physicians and nurses were primarily white, 67.6% and 61.9%, respectively, and 47.6% of community healthcare workers reported their race as multi-racial.

More than 50% of physicians and nurses reported having excellent or very good health status, whereas 65% of community healthcare workers reported good or fair health status. Physicians reported the highest percentage of excellent health status (32.4%). The professionals were also asked about their overall knowledge of PA and health recommendations (Fig. 1). The majority of professionals reported needing more information: community healthcare workers 97%, nurses 97%, and physicians (80%). Physicians reported having sufficient knowledge more frequently than the other categories of professionals (15.2%).

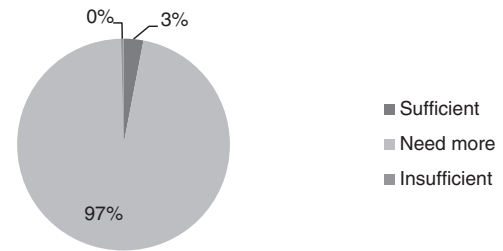
Table 1
Distribution of age, sex, race, self-reported health status and marital status. Primary healthcare units survey in Brazil, January–July 2011. N = 798.

Variable	Physician		Nurse		Community health worker		Total	
	n	%	n	%	n	%	n	%
Sex								
Male	103	56.59	53	15.27	29	10.78	185	30.18
Female	79	43.41	294	84.73	240	89.22	613	69.82
							798	
Age (years)								
20 to 29	44	24.18	164	47.4	76	28.25	284	35.63
30 to 39	59	32.42	117	33.82	107	39.78	283	35.51
40 to 49	32	17.58	44	12.72	58	21.56	134	16.81
50 to 59	31	17.03	18	5.2	24	8.92	73	9.16
>60	16	8.79	3	0.86	4	1.49	23	2.89
Total							797	100
Race								
White	123	67.58	215	61.96	104	38.95	442	55.53
Black	10	5.49	24	6.92	27	10.11	61	7.66
Asian	5	2.75	12	3.46	8	3	25	3.14
Multi-racial	44	24.18	96	27.66	127	47.57	267	33.54
Indigenous	0	0	0	0	1	0.37	1	0.13
Total							100	
Health status								
Excellent	59	32.42	88	25.36	48	17.84	195	24.44
Very good	53	29.12	105	30.26	44	16.36	202	25.31
Good	57	31.32	127	36.6	123	45.73	307	38.47
Regular	13	7.14	22	6.34	54	20.07	89	11.15
Bad	0	0	5	1.44	0	0	5	0.63
Total							100	
Marital status								
Single	56	30.94	153	44.35	65	24.16	274	34.47
Married/with partner	111	61.33	171	49.56	180	66.91	462	58.11
Separated	12	6.63	19	5.51	17	6.33	48	6.04
Widow	2	1.1	2	0.58	7	2.6	11	1.38
Total							100	

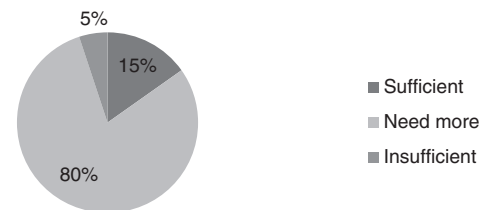
Most of the participants in each of the three professional groups reported that three days per week of moderate-intensity PA is recommended to attain health benefits (Fig. 2). Previous recommendations include five days of moderate-intensity physical activity and two days of vigorous-intensity physical activity. All three professional groups mostly reported that the recommended amount of moderate intensity (Fig. 3a) and vigorous intensity (Fig. 3b) of physical activity per day to achieve health benefits was only 30 min. Answers to questions regarding days and minutes per day of physical activity had more variability since they were open-ended, as such we grouped the minutes in increments of ten. The second most common answer in each of the groups was 60 min. The amounts suggested by the professionals are fewer days and minutes than the previous recommendation state. Most of the members of each group did however recognize that vigorous and moderate intensity PA can be used in combination to achieve health benefits.

Fig. 4a, depicts the response rate for all three professionals combined regarding physical activity recommendations through moderate-intensity activity per week, and Fig. 4b refers to the recommended amount of vigorous-intensity activity per week (U.S. Department of Health and Human Services, 2011; Blair et al., 2004; Pratt et al., 2010). Nearly 40% of the professionals believe that 90 min of moderate-intensity physical activity is the recommended amount for health benefits, and nearly 30% believe that 90 min of vigorous-intensity activity per week is needed. It is important to consider the percentage of healthcare providers that answered 150 min of moderate-intensity and the percentage that answered 75 min vigorous-intensity. The answers for 150 min of moderate were as follows: physicians (7.9%), nurses 9.1%, and community healthcare workers (3.6%). The answers for 75 min of

Community health care worker's self-reported knowledge of PA



Physicians' self-reported knowledge of PA



Nurses' self-reported knowledge of PA

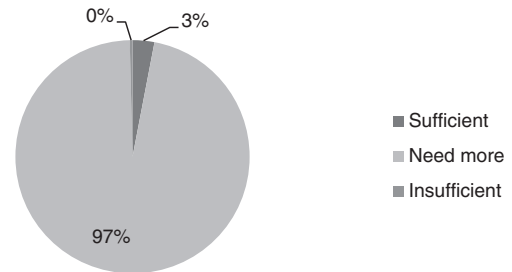


Fig. 1. Health Professionals reported knowledge of physical activity recommendations. Primary healthcare units survey in Brazil, January–July 2011. N = 798.

vigorous-intensity were as follows for physicians (0.0%), nurses (<1%), and community healthcare workers (<1%).

All professional groups were aware of the negative impacts on health from a sedentary lifestyle. Questions related to knowledge about diseases resulting from a physically inactive lifestyle had the following results. More than 80% from all groups reported type II diabetes, and more than 75% reported that high blood pressure, depression, and heart attack were consequences of a physically inactive lifestyle. More than 60% from each group recognized osteoporosis as a possible consequence of physical inactivity. A small percentage reported that a physically inactive lifestyle could be a risk factor for lung disease. Less than 10% reported that AIDS and cirrhosis are associated with physical inactivity (data not shown).

Discussion

While our results show that a higher percentage of nurses and physicians are more knowledgeable about current recommendations in regard to number of physical activity minutes needed per week to achieve health benefits compared to community health workers, all professionals lacked knowledge of accurate recommendations. This difference may be due to differences in the professional and academic training of nurses and physicians compared to that of community health workers. While a combination of the minutes suggested may be effective for health benefits, the reported PA alone does not align with recommendations. All

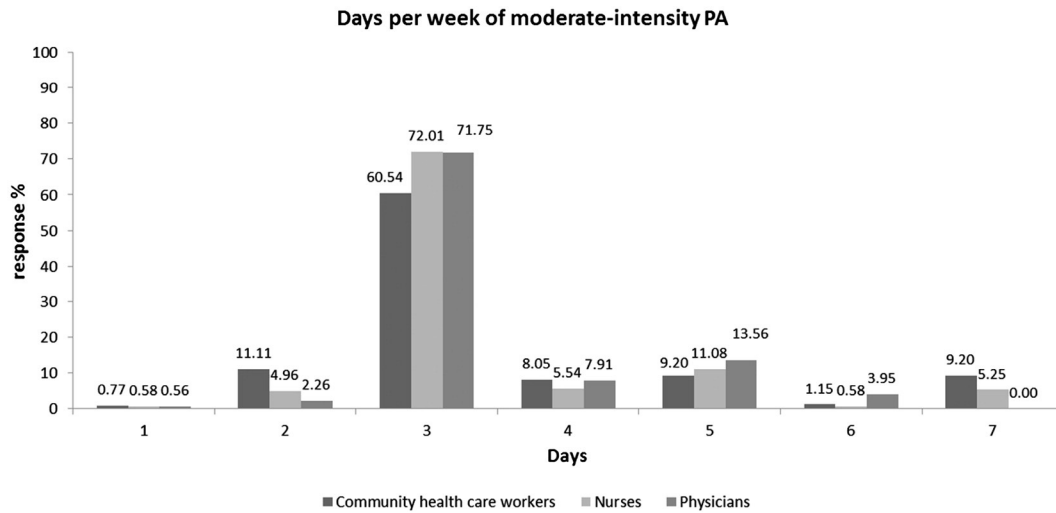


Fig. 2. Reported recommendation of days per week of moderate intensity physical activity by all three professionals combined. Primary healthcare units survey in Brazil, January–July 2011. N = 798.

three professionals demonstrated similar knowledge about what diseases may result from a physically inactive lifestyle. Physicians are more likely to counsel their patients on appropriate physical activity

recommendations if they are able to identify a health-related problem with a low-level screening tool. Recommendations can occur within the context of a visit and if the outcome of physical activity outweighs

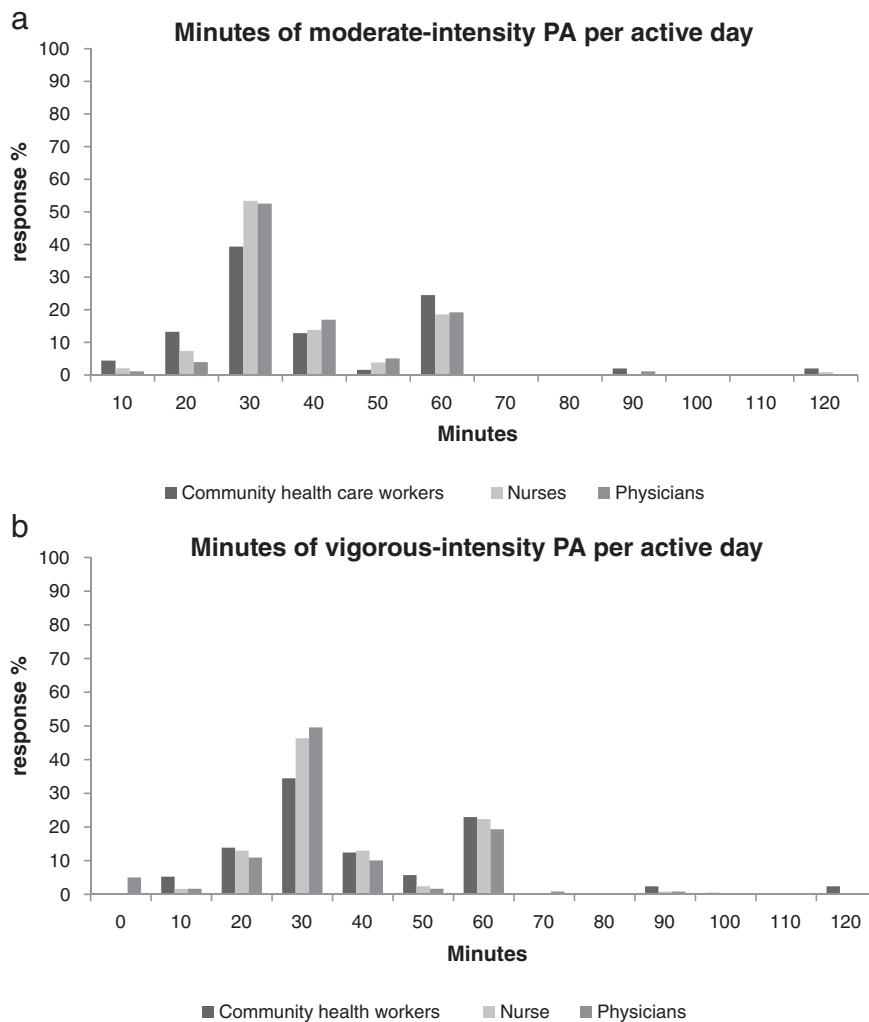


Fig. 3. a Reported recommendation of minutes of moderate intensity physical activity per day by all three professionals combined. Primary healthcare units survey in Brazil, January–July 2011. N = 798. b. Reported recommendation of minutes of vigorous intensity physical activity per day by all three professionals combined. Primary healthcare units survey in Brazil, January–July 2011. N = 798.

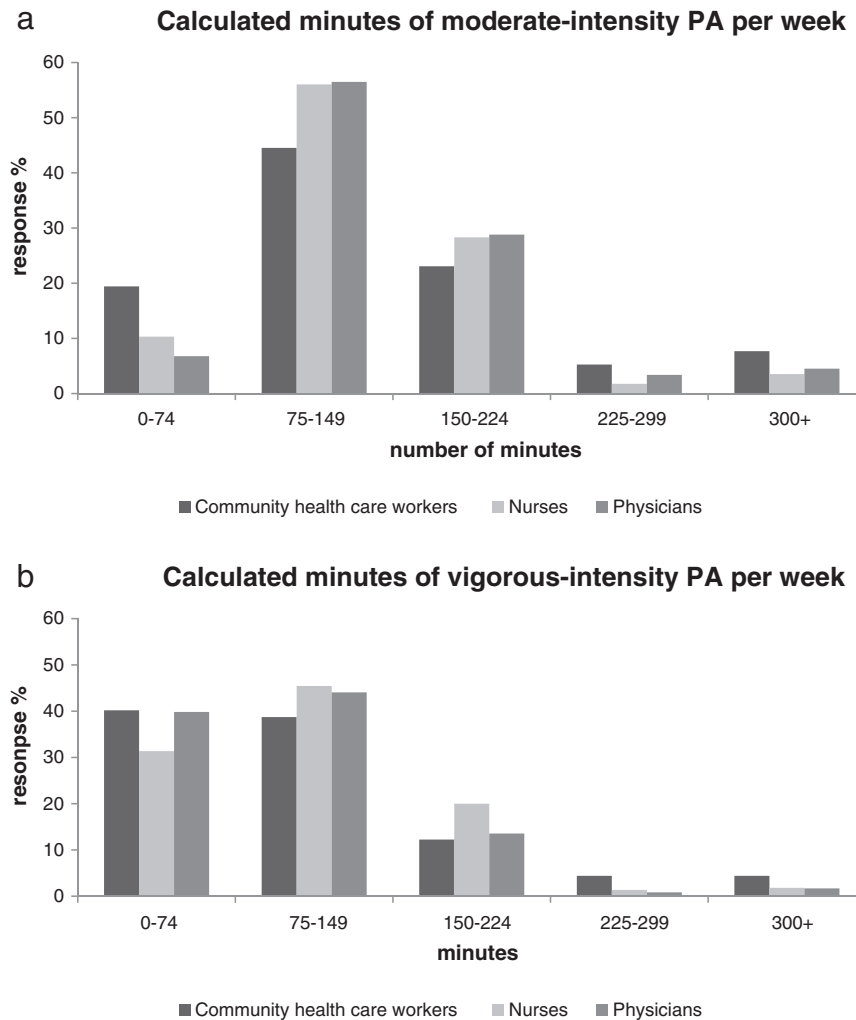


Fig. 4. a. Response rate of all three professionals combined, for meeting physical activity recommendations through moderate-intensity activity per week. Primary healthcare units survey in Brazil, January–July 2011. N = 798. b. Response rate of all three professionals combined, for meeting physical activity recommendations through vigorous-intensity activity per week. Primary healthcare units survey in Brazil, January–July 2011. N = 798.

potential harms, such as injury, death or osteoarthritis (Harris et al., 1989).

Although the sample from this study intended to obtain national representativeness, a relatively small number of physicians, nurses, and community healthcare workers were captured. Thus, small sample sizes, particularly for physicians might have limited our ability to detect differences. There is no equal distribution of response rates across the professional groups, which could lead to response bias when analyzing the sample in its entirety. However, when compared to other studies, our study reached a relatively high number of health professionals including physicians who are usually reluctant or very busy to make time for an interview or answer a survey. This study is also limited by the use of only primary healthcare units. It is not uncommon for patients to receive health information in regard to physical activity from other physicians or specialists (Anon., 2003). However, this study was not a comprehensive measure of the physical activity advice that patients are receiving in Brazil.

Despite these limitations, this study has several strengths. It is the first of its kind in the region. To the author's knowledge, there has not been another study assessing knowledge of PA across different groups of healthcare professionals. Although we mentioned the sample size as a limitation, the response rate is an improvement compared to previous studies. Also, the healthcare professionals that were selected for the

phone survey were chosen through random selection and the units were picked so as to represent Brazil in its entirety.

Moving forward, it is important that physicians remain abreast of current recommendations and ensure counseling with their own patients. In addition, previous literature states that physicians are more likely to counsel patients if they themselves perform aerobic exercise and strength training. Thus it is important for healthcare providers to engage in health behaviors and meet recommendations for physical activity. Due to the limited time that physicians have for patient's consultation, innovative methods of interaction and other opportunities should be explored to counsel and follow-up on physical activity counseling. In the United States and United Kingdom, over 30% of lay people reported using the internet, or web and email to access health information. These searches were primarily related to physical illness symptoms as well as nutrition/fitness (Abramson et al., 2000; Dickerson et al., 2004). Whether or not this information influences health decisions is yet to be known but it is a utilized and preferred method by many. Internet and email could provide opportunities for follow-up and counseling on physical activity in the patient/healthcare provider relationship.

In addition, in the last decade shared-decision making between physicians and patients has garnered attention as an effective method to engage patients. This is a big challenge in Brazil, since many primary

healthcare centers do not have information systems and are not able to use physician records to make innovative health strategies. Involving patients in their own physical activity plans increases the likelihood of meeting recommendations that are realistic and feasible. The disadvantage is the extra time required for counseling periods and appointments. Dissemination of physical activity recommendations and their updates is pertinent information for health professionals. Research into the best and most effective methods for this is vital to improve knowledge of those communicating the information to the public (Coulter et al., 1999).

A majority of all three groups of professionals hold beliefs and knowledge that do not align with previous or current physical activity recommendations. Without proper knowledge of current recommendations, professionals are limited in the type of counseling their patients receive and in their capacity to prevent diseases that result from inactive lifestyles. An important recommendation emanating from the results of this study is to build capacity and increase training of community health workers in Brazil. Although physicians are able to counsel their patients about physical activity we suggest that they may be limited by appointment times, in contrast community health workers which have more direct and prolonged contact with community members can help bridge this gap.

Author's contributions

LB, GM, and PH drafted the initial manuscript and develop all the preparation and analysis of the data. RB, DP, PH, MP, and FL conceived and designed the study and participated in the writing and interpretation of results and revisions of the manuscript. GC, AF, MB, FL, ES, MP, LM, and LR made substantial contributions to the manuscript and interpretations of results. All authors approved the final version and agreed to be accountable for all aspects of the work.

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Competing interest

The authors declare that there are no conflicts of interest.

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in this report are those of the authors and do not necessarily represent the official position of the CDC.

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Author/s:

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