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## Original research

# Correlates of physical activity counseling by health providers to patients with diabetes and hypertension attended by the Family Health Strategy in the state of Pernambuco, Brazil

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## ABSTRACT

**Aims:** The aim of this study was to determine correlates of physical activity (PA) counseling by health providers of the Brazilian primary care delivery system, for hypertensive and diabetic subjects, as well as correlates of actual leisure-time PA of these subjects.

**Methods:** This was a cross-sectional study conducted in random samples of 785 hypertensive and 822 diabetic subjects, in the State of Pernambuco, Brazil. Relationships between PA counseling and leisure-time PA and explanatory variables were sought through multiple logistic regressions.

**Results:** PA counseling had been received by 59.4% of the diabetic and 53.0% of the hypertensive subjects; around 30% of the diabetic and the hypertensive subjects declared having leisure-time PA. After adjustment, factors associated with PA counseling for diabetic subjects were: female gender, formal schooling, hypertension, obesity; for hypertensive subjects: being on a weight-loss diet, age between 60 and 74 and over 75. For both subject groups, leisure-time PA was more frequent when they lived in a medium-sized municipality, were female, aged between 60 and 75, and on a weight-loss diet.

**Conclusion:** PA counseling appeared restricted to subjects with excess weight and/or cardiovascular risk factors when it should be directed to all subjects with hypertension or diabetes.

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**Abbreviations:** FHS, Family Health Strategy; CHA, community health agents; PA, physical activity; SERVIDIAH, Evaluation of Health Services for DIAbetic and Hypertensive Subjects; BP, blood pressure; CVD, cardiovascular disease; VIGITEL, Surveillance System of Protective and Risk Factors for Chronic Diseases Telephone Survey in Brazil.

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## 1. Introduction

The Brazilian national health system has a community-based approach to providing primary healthcare through an interdisciplinary health team, free of charge for all citizens; and, nowadays, at least 62% of the population is covered by the Family Health Strategy (FHS) designed to perform several primary care functions. Patients registered within FHS units are attended by a health team consisting of a physician, a nurse, a nurse assistant, and several community health agents—CHA. They get a monthly home visit by the CHA for family health orientations and to make appointment with the physician when required; and health promotion activities are regularly performed at the FHS unit [1,2].

One important health promotion procedure is physical activity (PA) counseling [3,4]. It is estimated that 30% of the adult population worldwide is physically inactive [5] and that physical inactivity caused more than 5.3 million of the 57 million deaths in 2008 [6]. However, a systematic review in the USA found that around 50% of the physicians provided PA counseling for the patients [7]. In Brazil, the prevalence of PA counseling for the adult population is about 20% [8].

Limited data are available in Brazil on PA counseling and leisure-time PA among hypertensive and diabetic subjects, although PA importance for blood pressure [9] and glycemic control [10,11] is well known. Consequently, the aim of this study was to study PA counseling by FHS health providers toward hypertensive and diabetic subjects in the State of Pernambuco, Brazil; and actual leisure-time PA practice in these subjects.

## 2. Methods

The present study was performed using the database of the SERVIDIAH study (Evaluation of Health SERVICES for DIAbetic and Hypertensive Subjects) which was a cross-sectional epidemiological study conducted between November 2009 and December 2010, in a representative sample of hypertensive and diabetic subjects attended by the FHS in the State of Pernambuco. The general aim of the SERVIDIAH study was to assess the implementation and actual results of the Brazilian plan to improve primary care for hypertension and diabetes within the FHS [12]. Following are summarized the main methodological procedures for the present study. Further details can be found in Fontbonne et al. [13].

### 2.1. Study sample

The study covered 35 municipalities, of which 16 had less than 20,000 inhabitants (small-sized), 16 had between 20,000 and 100,000 inhabitants (medium-sized), and three had over 100,000 inhabitants (large-sized). From these 35 municipalities, 208 FHS teams were randomly selected and within each team a random sample of between three to six hypertensives and three to six diabetics subjects, in order to ensure an even balance of subjects by municipality size category, was drawn. Subjects were considered hypertensive when they were registered by the CHA as having hypertension but not diabetes,

and diabetic when registered as having type 2 diabetes, with or without hypertension.

The final sample consisted of 785 hypertensive and 822 diabetic subjects aged over 20 years. The general response rate was 86.7%.

The SERVIDIAH study was approved by the Ethics Committee of the Aggeu Magalhaes Research Centre, Oswaldo Cruz Foundation (registration number 43/2008), and the Brazilian National Commission of Ethics in Research under the registration number 889/2008. All respondents were informed about the objectives and procedures of the study, and signed a consent form.

### 2.2. Data collection

The data were collected through a structured questionnaire by face-to-face interviews, conducted by trained field researchers. The participants were interviewed in their homes or in a room in the FHS health unit.

PA counseling was assessed through the following question: "Has any health provider of the Family Health Strategy ever counseled you to modify (improve) your physical activity habits? (Yes/No)". Leisure-time PA was self-reported as "none", "light" (e.g., walking, bicycling or dancing for more than three hours per week), "moderate" (e.g., running, practicing gymnastics or another sport activity for more than three hours per week) or "vigorous" (sports competition), and analyzed as a Boolean variable (Yes = any leisure-time PA/No = no leisure-time PA).

Socio-demographic and lifestyle characteristics were self-reported, and categorized as follows: age (20–59 years/60–74 years/75 and over); sex (Male/Female); formal schooling (Yes/No); family income (Up to minimum wage/Over minimum wage; monthly minimum wage at the time of the study was R\$545, US\$310); tobacco consumption (Yes, present smoker/No, never or ex-smoker); alcohol consumption (Yes/No); adherence to salt-free (Yes/No), sugar-free (Yes/No), and/or weight-loss diets (Yes/No).

Resting systolic and diastolic blood pressure (BP) was measured at three different times during the interview with the subjects well-relaxed for all three measures by an Omron® digital wrist BP device. The mean of the three values was used for analysis. In hypertensive subjects without diabetes, BP was considered well-controlled when systolic BP was below 140 mmHg and diastolic BP below 90 mmHg; in diabetic subjects, respective thresholds for good control were 130 and 80 mmHg [14].

For diabetic subjects, HbA1c levels were measured in a capillary blood sample using the in2it point-of-care analyzer (Bio-Rad Laboratories Inc., Berkeley, USA). Diabetes was considered well-controlled if HbA1c level was below 7% [15].

All study subjects were weighed (accurate to 0.1 kg) with a Tanita BC553 electronic scale (Tanita Corp., Tokyo, Japan). Height was measured with a portable stadiometer (Alturaexata, Belo Horizonte, Brazil). Body Mass Index (BMI) was used to classify the subjects as overweight (between 25 and 29.9 kg/m<sup>2</sup>) or obese (30 kg/m<sup>2</sup> or over) [16]. Waist circumference (WC) was measured halfway between the lowest rib and the upper ridge of the iliac crest; men with WC ≥ 102 cm and women with WC ≥ 88 cm were classified as having high WC [16].

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