

Are Diet-related Factors Associated with Differences in Mean Arterial Pressure Among Portuguese Natives and African Migrants?

A Study with Medicated Hypertensive Patients followed at Lisbon Primary Health Care Centres

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Introduction

Diet-related disparities: differences in diet, as well as in the incidence, prevalence, mortality, and burden of disease between and within specific population subgroups – normally experienced by racial and ethnic minority groups¹.

What is known

- Nutrition and diet have been presented as key factors in the control of chronic diseases such as hypertension (HTN)², and also as a source of disparities between different ethnic groups¹.

- It is well known that the major dietary modifications that lower BP are: reduced salt intake, weight loss, moderation of alcohol intake, a diet rich in fruits and vegetables².

- African migrants, when compared with the other ethnic groups, have higher blood pressure (BP) and are at greater risk of BP-related complications².

- An increasing attention has been given to mean arterial pressure (MAP)³, which is a well-established marker of cardiovascular risk in different clinical settings⁴.

Aims

To explore if MAP is associated with diet-related factors such as knowledge of and compliance with the nutritional recommendations (NR) of fruit, vegetables and fish, in Portuguese natives and African migrants medicated hypertensive patients.

Methods

Design and Participants

Population-based cross-sectional study, integrated in the DIMATCH-HTA project that evaluated BP control and its determinants among hypertensive medicated patients, aged between 40-80 years, from two cohorts (African migrants and Portuguese natives). Both cohorts were randomly selected from Primary Health Care Centers of Lisbon's Region.

Data Collection and Variables

Participants were interviewed between September 2010 and March 2011. **Table 1** presents the conceptual model¹ and the relevant variables that were collected.

Table 1: Collected variables

Demographic characteristics	Social inequality factors	Psychosocial factors	Disease-related factors	Biomedical factors
Age	Ethnicity	Knowledge of NR	BP values	Diabetes
Sex	Age	Beliefs about diet	Years of disease	Cholesterol
Education	Sex	Need for information about diet	Number of medicines for HTN	Obesity
Employment	Language and literacy	Social support		
Income	Immigrant status / acculturation			
Ethnicity				

Dependent Variable

- From three BP measurements taken at baseline interview, we estimated MAP, using the following formula: $MAP = DBP + 1/3 (SBP - DBP)$.

Results

Data from 497 subjects were analyzed: 59.8% natives and 40.2% migrants, with a mean±SD age of 64.0±9.1 and 57.0±10.2 years ($p < 0.01$), respectively.

Table 2: Characteristics of the study sample.

Characteristics	All (n=497)	Natives (n=297)	Migrants (n=200)	p*
Age (yrs), mean±SD	61.2±10.4	64.0±9.1	57.0±11.0	<0.01
Male, % (n)	45.1% (224)	54.2% (161)	31.5% (63)	<0.01
MAP, mean±SD	105.2±14.5	104.2±13.5	106.8±15.9	0.18
Anthropometric data, % (n)				
Overweight/obesity (BMI ≥ 25.0 Kg/m ²)	82.1% (408)	88.4% (240)	85.4% (168)	0.04
Compliance with NR (number of times), % (n)				
Daily fruit intake (3-5)	29.2% (145)	35.0% (104)	20.5% (41)	<0.01
Daily vegetables intake (3-5)	7.4% (37)	6.7% (20)	8.5% (17)	0.46
Weekly fish intake (at least 2)	77.7% (386)	83.2% (247)	69.5% (139)	<0.01
Knowledge about NR (number of times), % (n)				
Daily fruit intake (3-5)	55.7% (277)	55.9% (166)	55.5% (111)	0.93
Daily vegetables intake (3-5)	24.9% (124)	19.5% (58)	33.0% (66)	<0.01
Weekly fish intake (at least 2)	94.6% (470)	95.6% (284)	93.0% (186)	0.21

*p-value for Chi-square (categorical variables) and Mann-Whitney U (continuous variables) tests.

As shown in **table 2**, a higher proportion of overweight/obesity was observed among migrants ($p=0.04$), who also reported more frequently to know vegetables NR ($p < 0.01$). A higher proportion of natives reported to comply with NR for fruit and fish ($p < 0.01$ for both).

Multiple linear regression models were used ($p < 0.10$) to explore predictors for MAP in both ethnic groups. Table 3 presents male and female natives, and migrants (no sex differences were found in this group) predictors.

Table 3: Multiple linear regression results.

Model	Variable	CI	p
Male Natives	Age	]-0.6;-0.1[	<0.01
	Meet the NR for fruit?	]-0.6;8.5[	0.09
Female Natives	BMI	]-0.1;1.1[	0.10
	Diabetes	]-0.5;-13.3[	0.07
Migrants	Male	]-0.4;10.2[	0.07
	Meet the NR for vegetables?	]0.5;16.7[	0.04
	Level of Education	]-1.2;0.1[	0.08
	Adherence to antihypertensive medication	]-11.4;-1.9[	0.01

Discussion and Conclusions

In agreement with the results previously stated, ours indicate that **MAP levels seem to be related with nutrition and diet** (higher MAP levels seem to be related to lower fruit consumption and overweight in male and female natives, respectively, and to lower vegetables consumption in migrants). Therefore they **support intervention strategies towards priority groups**, in order to improve eating habits while reducing CV risk.

What this study adds

- BP control is affected by:
 - Nutritional knowledge and dietary patterns, and
 - Comorbidities and sociodemographic conditions, which vary by ethnicity.
- MAP can be a useful measure to explore HTN disparities.

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