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Physical activity and healthy diet: determinants and implicit relationship



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ABSTRACT

Objective: People who decide to lose weight by dieting often do so without participating in any associated physical activity. Although some people who participate in sports are unconcerned about their diet, it is generally believed that people who exercise tend to eat a healthy diet and those who do not exercise eat a less healthy diet. There is no clear relationship between the decisions regarding participation in physical activity and eating a healthy diet when choices are taken freely and not influenced by policy factors promoting healthy behaviour. However, these decisions may reveal some common explanatory factors and an implicit link. As such the aim of this study was to identify the common explanatory factors and investigate the existence of an implicit relationship.

Study design: Econometric estimate – bivariate probit estimation.

Method: Using data from the Portuguese National Health Survey, a bivariate probit was undertaken for decisions regarding participation in physical activity and eating a healthy diet. The correlation between the residuals gives information on the implicit relationship between the healthy choices.

Results: Common explanatory factors were found between the decisions to eat healthy snacks and participate in physical activity, such as being married. However, holding voluntary private health insurance, smoking, getting older, living alone and unemployment were found to dissuade people from making healthy choices. Positive correlation was found between the residuals of the probit estimations, indicating that other unmeasurable variables have a similar influence on both decisions, such as peer pressure, cultural values, fashion, advertising and risk aversion.

Conclusions: Further research is needed to improve understanding of decision making related to participation in physical activity and eating a healthy diet. This will facilitate the design of policies that will make a greater contribution to healthy lifestyles.

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Introduction

Belloc and Breslow¹ identified the relationship between health practices and health in 1972. They reported that good

practices, such as regular meals and physical activity, are positively associated with health. Some 40 years later, concern about the relationship between health, healthy food and physical activity has risen significantly, and in 2004, the World Health Organization published the ‘Global strategy on

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diet, physical activity and health'.² The strategy addresses the two main risk factors of non-communicable diseases, namely diet and physical activity. Unhealthy diets and physical inactivity are among the leading causes of the major non-communicable diseases, including cardiovascular disease, type 2 diabetes and certain types of cancer, and contribute substantially to the global burden of disease, death and disability. Other diseases related to diet and physical inactivity, such as dental caries and osteoporosis, are widespread causes of morbidity.² These facts provide the backdrop to the present study, showing that diet and exercise are conducive to a healthy life.

Research has been undertaken into the determinants of physical activity,^{3,4} the relationship between diet and health,^{5,6} and the relationship between physical activity and health.^{7,8} Some researchers have explored the links between all three elements.^{9–13} Research into multiple health behaviour changes^{14–18} has been attracting attention, mainly due to public health recommendations and public health programmes. However, the relationship between free (as opposed to induced) choices to participate in physical activity and eat healthy food seems to be undocumented or little studied. People who decide to lose weight by dieting often do so without any associated physical activity. Other people participate in sports, thus allowing them to have a less restrictive diet; however, most commonly, people who do less physical exercise eat less healthy food.^{19,20} In other words, the lifestyle patterns linking exercise and diet are diversified.^{21,22} There is no clear relationship between the decision to participate in physical activity and the decision to eat a healthy diet. Research on this topic is ongoing and the debate on how to improve policy recommendations is open.^{14,15,23}

Much of the existing evidence for a relationship between diet and physical activity was obtained from health programmes or projects designed to improve peoples' behaviour, or for a particular social group.^{12,17,24–27} Less attention has been paid to the issue of how people generally behave of their own free will, when their decisions are not influenced by recommendations or other coercing factors.

In Portugal, many people are concerned about their body's appearance, possibly because the beach season lasts for nearly six months of the year. Many Portuguese eat a Mediterranean diet, which includes a substantial component of fruit and vegetables. However, although people in Portugal are concerned with their diet and their body's appearance, the percentage of the population which is overweight has been increasing in recent years.^{28,29}

This study contributes to the debate regarding factors explaining healthy choices and the relationship between diet

and physical activity. To the authors' knowledge, this is the first study to use this method.

Data and variables

The data analysed in this study were provided by the 2005 Portuguese National Health Survey (PNHS), which covered all regions of Portugal. (This survey is neither annual nor periodical. Surveys exist for 1987, 1995, 1998 and 2005. Due to the debt crisis, there is no estimated date for a new survey.) A sample of 19,581 private households was selected using a multistage random probability method, resulting in a nationally representative sample of the Portuguese population. The PNHS includes a broad set of questions covering several topics from personal identification to sport, food and chronic diseases. The questions are given and answers recorded by trained interviewers during a face-to-face interview with the household representative. The PNHS is an initiative of the National Health Institute (Instituto Nacional de Saúde Ricardo Jorge³⁰) in conjunction with Statistics Portugal (Instituto Nacional de Estatística). All adults (age >18 years) from the 2005 PNHS were considered in the present study ($n = 33,770$; 47.5% males and 52.5% females).

The dependent variables in this study were the decision to undertake physical activity (represented by *PhysAct*) and the decision to eat healthy snacks (represented by *Hsnack*). Both variables are binary, assuming a value of 1 for 'yes' and 0 for 'no'. The dependent variables are described in [Table 1](#).

The variable *PhysAct* is captured by all the answers that combine the number of days (>2 days) and the time per day (>20 min) spent participating in physical activity. The question about physical activity was asked during the second trimester of the PNHS, and covered approximately 25% of the households from the whole sample. As it is not possible to identify these households in the database, a null value relating to this question may mean that there was no physical activity or that the question was not asked.

The variable *Hsnack* is a proxy to capture the behaviour that people have towards food. No information is available regarding the type and quantities of food consumed during meals. However, food choices between main meals provide a good indication of how and what people decide to eat. As such, *Hsnack* accounts for the answers that included fruit, bread or yogurt, as opposed to juice, soda, cakes, sweets, salted snacks and chips.

In order to apply the estimation method, several independent (explanatory) variables were taken into account ([Table 2](#)). The variables were grouped into four types: economic, social, occupational and health. It follows that the

Table 1 – Dependent variables.

Dependent variable	Number of observations	Description	Number of observations	%
<i>PhysAct</i>	33,770	1, engaging in moderate or intense physical activity	3460	0.102
		0, otherwise	30,310	0.898
<i>Hsnack</i>	33,381	1, eating healthy snacks such as fruit, bread or yogurt	22,311	0.668
		0, otherwise (i.e. eating unhealthy snacks such as juice, soda, cakes, sweets, salted snacks and chips)	11,070	0.332

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