



New food product consumer's behaviour: Health literacy and neophobia

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ABSTRACT

Background

The development of a new food product aims to respond to consumer's concerns related to food and health promotion. Education plays a fundamental role in consumer's behavior by providing tools that allows them to make informed decisions. Consumer's empowerment is essential to the success of a health promotion strategy, also the knowledge of health literacy level is important to define a proper health policy. The aim of this study is to evaluate health literacy level and new foods consumption behavior (especially neophobic and neophilic behavior) of the Lisbon area residents in Portugal.

Methods

A questionnaire, that includes the Portuguese version of the Newest Vital Sign, was applied to a stratified sample of 384 individuals (over 15 years old) living in the Lisbon area in Portugal distributed accordingly to 2001 Census. Health literacy was evaluated by the Portuguese version of NVS, a tool by which a number of health-related information, in this case nutritional information written in a food label, is used to demonstrate one's ability to use it to answer to questions. Data analysis was performed in SPSS®, version 19.

Results

Study results show that there is a close relationship between health literacy and general literacy. It is also clear that health literacy level is low for the majority of the participants and that this factor is relevant in new foods consumption, by positively affecting neophilia. Older individuals, with lower school years attendance and health literacy, are the main consumers with neophobic behavior. Higher health literacy is also directly associated with consumers concerns on how the product was manufactured and on environmental characteristics. There is no statistical association between gender and health literacy, but it is of relevance the fact that an association between health literacy and food neophilia is statistically significant.

Conclusion

Considering that new food products may improve health and diet aspects of a population, our findings allow us to conclude that educational strategies are needed to improve health literacy and consequently food neophilia, especially in the older population with lower school years attendance. Significant determinants of the acceptance of novel food products include: educational level, health literacy level and age.

Keywords: Consumer Education, Consumer Behavior, New Food Products, Health Literacy, Neophobia, Neophilia

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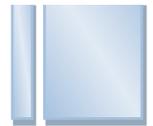
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INTRODUCTION

At the present time increasing attention is devoted to the relationship between food consumption and health. Even aspects such as environmental sustainability, fair trade, ethical production, and manufacturing technologies are key to food consumption.¹ Consumer's needs and worries should be in the center of food production and development,² and its goal should be to fulfill those needs and concerns offering technical solutions and a new nutritional perspective. However not all consumers can profit from new products since, in humans, there are huge differences in the way people react to a new food related situation.³⁻⁷ A neophobic behavior can prevent consumers from eating a novel food⁸ and, in extreme cases, conduce to malnutrition.⁹ There are several factors that can explain this aversion, such as age and culture.^{1,10} On the other hand, neophilic behavior, which considers the unknown as a stimulus, is characterized by a high acceptance to experimentation,³ allowing consumers to experience an array of dietary sources that might better fulfill their nutritional needs.¹¹ Age, gender, cultural and educational aspects can also impact on consumer's health literacy and on the ability to access nutritional and health related information. Literacy skills are related to health outcomes and are fundamental to empower individuals, not only to develop their potential to control daily events but also to fully participate in society.¹ Poor literacy skills are common even in developed countries, abilities like reading and writing are essential for a good rapport with health education and self-management of health, as well for the decision making process. Literacy definitions may show different perspectives of the same concept, ranging from the simple understanding of the written word, to the understanding of the same word in an everyday context, or even to the use of language associated to writing and numeracy. Same happens with the health literacy concept since its definition sometimes states a written material in a health environment or, in other occasions, it can be understood as the use of more elaborated skills.¹ Overall it is accepted that the concept of health literacy refers to the ability of an individual to obtain, interpret and understand basic information on health and services in a way that promotes health.¹² This is more than being able to

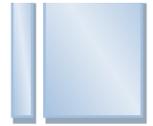
transmit information since it implies, also, the acquisition of competences to acquire particular information and to apply it, successfully, to the real world. Low health literacy may be regarded as a risk factor for decision making in health¹³ and individuals presenting superior general literacy abilities, have a higher probability to present increased health literacy abilities, showing also a strong association among literacy, social factors and health status.¹⁴

METHODS

A questionnaire, which includes the Portuguese version of the Newest Vital Sign (NVS),¹ was applied to a sample of 384 individuals¹⁵ from the Lisbon area, distributed in accordance with the 2001 Census of the Portuguese population. In the Lisbon area lives 25% of the Portuguese mainland population with a mean age very close to the Portuguese total population. From these individuals only those over 15 years old (age considered to define a consumer¹) were selected to participate in the study. The questionnaire is divided into five dimensions: sample characterization; health literacy; responsible food consumption; environmental awareness on the consumption of food products, and concern about health issues. The level of health literacy was scored in 3 groups, using the number of correct answers (six questions giving one point for each correct answer), a score of 0-1 correct answers suggests high likelihood (50% or more) of limited literacy, 2-3 correct answers indicates the possibility of limited literacy, 4-6 correct answers almost always indicate adequate literacy. Food consumption behavior was evaluated in two of the dimensions allowing the characterization of neophobic and neophilic aspects as well as environmental aspects on food consumption and finally, in the last dimension, its relation with health concerns. Data analysis was performed using SPSS®, version 19.

RESULTS

From the 384 individuals participating in this study, 53% are female; most of them (66%) are in the age group of 25-64 years old. The educational level of 34% of the participants is high-school and for 26% of them the highest degree obtained was 9 school-years. Only 18% of the sample individuals have an University diploma. Results are presented using



demographic characteristics, such as gender, age and school-years attended. Age distribution is presented (Fig.1), showing a higher percentage of individual in the 25 to 44 and 45 to 64 years old groups.

Concerning gender, female individuals are older than males, 21% of women are over 65 years old, only 15% of men are in this age group, and this reflects the findings of the 2001 census of the Portuguese population.

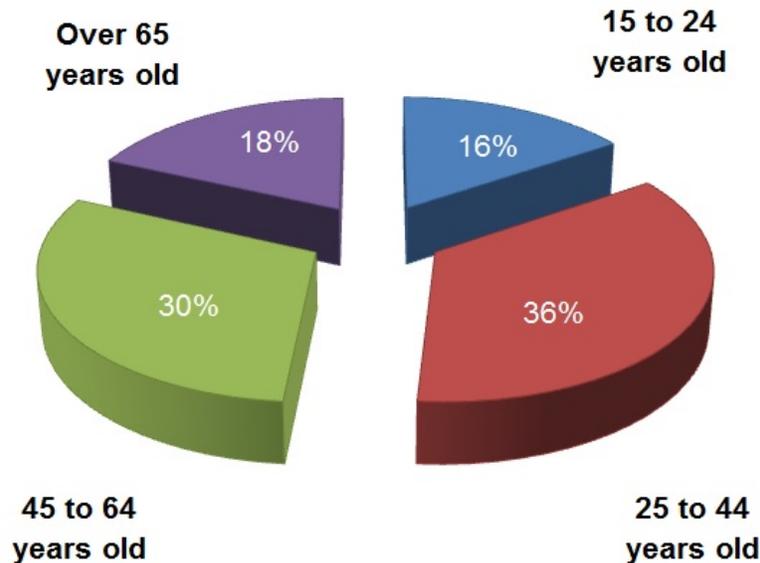


Fig 1 Participants Distributed by Age Groups

For health literacy, 54% of the participants presented a low level of literacy (Fig.2). It was possible to notice that women outnumbered men in all of the Newest Vital Sign score groups. In fact, for group 0 to 1 correct answers, 34 of the respondents were women and 29 men. For group 2 to 3 correct answers, 77 were women and 66 men, and finally for group 4 to 6 correct answers, 92 were women and 86 men. There is no statistical association between gender and health literacy ($p=0.911$). Concerning age, a highly significant value ($p<0.01$) was found for independency test between age and health literacy. Older individuals, 65 years old or more, gave more frequently 0 to 1 correct answers in the NVS, on the other hand younger people, between 15 and 44 years old, responded correctly more often to 4 to 6 questions. It was also possible to observe that 2 to 3 correct answers were given by participants in the 45 to 64 years old age group.

Concerning school-years attended, there is a statistically significant positive correlation ($p<0.01$) between health literacy and general literacy. The older the respondents are, the lower is the number of school-years attended. Answer correctly to 4 to 6 questions increases with the rise of school-years attended. Only 8% of the respondents with elementary school gave 4 to 6 correct answers and 83% of the university level respondents did the same.

Women are more concerned about the way products are manufactured than man, in a statistical significant way ($p<0.01$). Those who present higher level of health literacy have more concerns with the manufacturing ($p<0.01$) and also with the environmental aspects of food production ($p<0.01$).

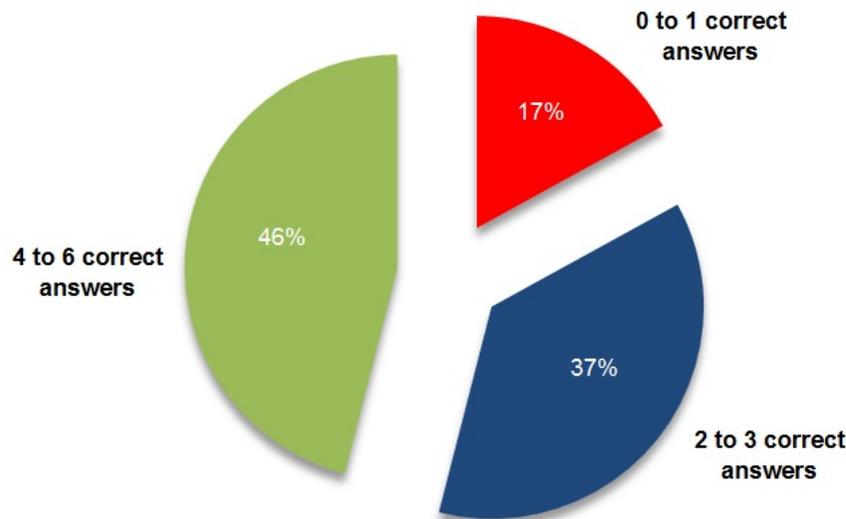
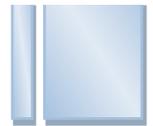


Fig 2 Participants Health Literacy Level

Higher level of health literacy is also directly related with neophilic behavior ($p < 0.01$), but there is no statistical significant relation between health literacy and health outcomes expected from acquiring food products with health claims (table 1).

Older individuals with lower number of school years attendance and lower health literacy are among those who are neophobic. Food consumption is also related to health outcomes mainly to men, although the difference is not statistical significant ($p = 0.360$) and for those who have higher levels of health literacy ($p < 0.01$).

Table 1 Statistical Relation Between Health Literacy Level and Health Outcomes Expected from Food Products with Health Claims and Neophilic Behavior

	Test Value	Degrees of freedom	p-value
Association between health literacy and: Acquiring products with health claims	2.273 ⁽¹⁾	2	0.321
Acquiring new food products	13.039 ⁽¹⁾	2	0.001 *

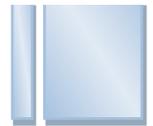
¹ Kruskal-Wallis non parametric Test

* Significant at 1%

DISCUSSION

New food products acceptance is directly related to health literacy level. It is also possible to observe an association between the numbers of correct answers in the NVS scale and school attendance years. Participants with higher instruction tend to have more correct answers. These results are similar to those found by other authors.¹⁶⁻¹⁹ If comparison is made between gender, age group and number of correct answers in the NVS, it is possible to show that young women (up to 44 years old) present better level of health literacy than older women, which can be explained by the low of education level in

Portugal, especially in women, during part of last century. This fact, by itself, may indicate a more difficult approach to sources for health promotion information. A negative relation between age and health literacy level was also found, that means that older respondents have lower health literacy levels, the same was found by other authors.¹⁹⁻²¹ Fifty-four percent of respondents have a high probability of low health literacy levels, that fact can be explained by data referred by Nutbeam¹³ in which the OECD estimates that between 7% and 47% of the world population presents low functional literacy levels. Regarding neophobic and neophilic behavior, our findings are consistent with the relation between



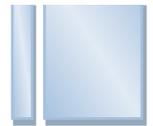
neophilic behavior and higher levels of health literacy.¹ Considering the fact that a neophobic behavior can be a barrier to novel food's health benefits,⁹ older individuals can be of risk.²² Consumer education seems to be a key factor for using health information related to food and new food products,²³ also, health literacy level knowledge may be an opportunity for education and empowerment.

CONCLUSION

Low literacy levels and the corresponding relation with health literacy is a relevant issue when dealing with health promotion. Evaluating an individual or a community's health literacy level will permit the development of strategies that will allow the adequacy of public health policies. An individual health literacy level has a direct influence on the ability to access health information; it also contributes to the empowerment and consequent action within the society, allowing a critical positioning and active participation in community decision process. As a conclusion, even considering that this study is limited to a sample of Lisbon area, a contribution to the debate on the relevance of consumer education, particularly the one related to food consumption in order to achieve health promotion, was made. The findings of the present study are an opportunity for new studies that might present strategies for consumer's education, to improve health literacy and consequently food neophilia. It is important to be able to try novel foods with health related concerns. Older adults with lower level of education are the most in need for educational programs on health literacy and food consumption.

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