Conocimientos y prácticas relacionadas con el uso de la sal: una investigación exploratoria de chefs iberos para promover universidades saludables

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Resumen

Fundamentos: Es importante comprometer a los chefs, actores principales en la producción de comidas, en estudios exploratorios de comportamientos para formular intervenciones efectivas para promover una alimentación saludable en las universidades. Por tanto, el objetivo de este estudio fue evaluar los conocimientos y prácticas de los cocineros asociados a la sal.
Métodos: Se trata de un estudio transversal con manipuladores de alimentos de comedores de universidades públicas del norte de Portugal (PT) y España (SP) mediante cuestionario para evaluar los conocimientos y prácticas asociados al uso de sal.
Resultados: Un total de 36 manipuladores de alimentos (12 de PT y 24 de SP) completaron la encuesta. Los manipuladores de alimentos SP eran significativamente más jóvenes (p = 0,034) y la mayoría de los sujetos eran mujeres. La mayoría reconoció el nivel recomendado de ingesta diaria de sal y conocía los impactos en la salud del consumo excesivo. El factor más importante que determinó la cantidad de sal agregada a las comidas fue el gusto del manipulador de alimentos y la mayoría estaba de acuerdo con la reducción de sal. La principal dificultad en la reducción de la sal fue la opinión del consumidor. La mayoría tenía interés en la inclusión de tecnología o nuevas herramientas para ayudar a la medición de la sal. El componente de la comida más adecuado para la reducción de sal fue la sopa (PT) y las ensaladas (SP) (p = 0,013).
Conclusiones: Los resultados de este estudio proporcionan información valiosa sobre los muchos factores que influyen en el uso de la sal y las opiniones de los chefs con respecto a las posibilidades de reducción de la sal. Esta encuesta podría ser un primer paso en el desarrollo de estrategias para hacer que las comidas en los comedores universitarios sean más saludables.

Palabras clave: Sal; Catering; Universidad; Cocineros; Promoción De La Salud.

Knowledge and practices related to salt usage – an exploratory investigation of ibero chefs to promote healthy universities

Summary

Background: It is important to involve chefs, the main players in the production of meals, in exploratory studies of behaviours to formulate effective interventions to promote healthy eating at universities. Therefore, the aim of this study were to assess the knowledge and practices of chefs associated with salt.
Methods: This was a cross-sectional study with food handlers from canteens from north of Portugal (PT) and Spain (SP) public universities by questionnaire to assess the knowledge and practices associated with salt usage.
Results: A total of 36 food handlers (12 from PT and 24 from SP) completed the survey. The SP food handlers were significantly younger (p=0.034), and the majority of subjects were female. The majority recognized the recommended level of daily salt intake and knew health impacts of excessive consumption. The biggest factor that determined the quantity of salt added to meals was the taste of food handler and the majority agreed with salt reduction. The main difficulty in salt reduction was the opinion of the consumer. The majority has interest in the inclusion of technology or new tools to help the salt measurement. The component of the meal more suitable to salt reduction was the soup (PT) and salads (SP) (p=0.013).
Conclusions: The results of this study provide valuable insight into the many factors that influence salt usage and the opinions of chefs regarding salt reduction possibilities. This survey could be a first step in the development of strategies for bringing university canteen meals more healthy.

Key words: Salt; Catering; University; Chefs; Health Promotion.

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Introducción

The university period during the life span, usually young adult age between 18 and 24 years old, is characterized by major changes in lifestyle accompanied by an increase in independence and freedom from parental control and from the limitations of an active professional life. Some studies pointed that college students may be at risk for inappropriate eating habits (high intake of fast food, sweets, soft drinks and alcoholic beverages, and low intake of fruits, vegetables, fish, whole grains and vegetables), exacerbation of behavioral food disorders and weight gain. It is often this the first time in their life that these young adults are responsible for autonomous choosing, buying (with limited budget) and cooking food (1-4). This risk situation could be exacerbated in younger and those that are away from their family home (2, 5).

Universities manage a complex ranging of food and catering services inside the campus, providing most of the meals consumed by students through coffee shops, canteens, restaurants and food vending machines (6). Thus, there is a need to develop health policies in university campus to promote healthy eating habits among students, promoting the construction of dietary patterns that will follow during adulthood (3, 7). The concept of Health Promoting Universities supported by the World Health Organization (WHO) describes the importance of the university by protecting the health and promoting the well-being and health of students, staff and the wider community through their policies and practices (8).

Barbosa and colleagues have studied the sodium content of meals served in university canteens in the North of Portugal, and found that with a single university meal, composed by soup and main dish, students can reach 53% of the maximum daily value recommended for sodium (9). Table salt, or sodium chloride, is an essential mineral to several physiological functions in human body; however, its chronic excessive consumption is dangerous for health, being causally linked to high blood pressure and increased risk of cardiovascular diseases (10). In 2017, the dietary risks (including high intake of sodium-rich foods) and the high blood pressure are in the top 5 causes of disability-adjusted life years (DALYs) of Portugal and Spain (11). Moreover, the cardiovascular diseases are the main causes of death in these ibero countries, causing morbidity, mortality and a tremendous economic impact in the societies (12, 13).

The WHO recognize that the reduction of salt intake was a priority to reduce non-communicable diseases, and recommends that daily sodium ingestion should be less than 5 g (2000 mg sodium/day) (14). Small reductions in the consumption can bring great benefits to the health of the population, not only in terms of cardiovascular diseases, but also in relation to other chronic diseases (15). In 2013, all WHO member states adhered to the goal of reducing salt consumption in the population by 30% until 2025 (16).

In European countries, a large proportion of the dietary salt is added by the industry in the production of food and in food consumed outside the home provided by catering, it is estimated that 75-85% of the salt intake comes from these sources (15, 17). Therefore, involving food industry and catering industry is basilar to reduce populations' salt intake (18).

It is very important to involve food handlers and chefs, the main players in the production of meals, in exploratory studies of behaviours

to formulate effective interventions to reduce salt addition in catering. Therefore, the aim of this study were to assess the knowledge and practices of food handlers associated with salt intake and added salt in meals in ibero public universities.

Material y métodos

Sample

This was a cross-sectional study performed to assess the knowledge, attitudes, and practices related to salt use among food handlers from two public canteens from north of Portugal and Spain. Eligibility criteria included all food handlers from restaurants and canteens that cook hot meals (for lunch and/or dinner) inside the university campus.

The catering systems used by the universities were different. The Portuguese (PT) University had a direct management of the meal production and distribution system, with only one central kitchen providing all meals for the entire university campus (including one restaurant, one canteen and four snack bars). The Spanish (SP) University had a concessionary management of the system of production and distribution of meals, and each school had a canteen with a differentiated management (at the total five different canteens or cafeterias were analyzed).

Survey respondents were the restaurants' owners and/or chefs, those who knew the most about the restaurants' cooking practices and assumed responsibilities of the addition of salt to foods. All participants were informed that the questionnaire was anonymous and individual, and previous informed consent to the treatment and scientific dissemination of results was obtained from each participant, following the principles of the Declaration of Helsinki.

Survey

The questionnaire used to collect the data, was adapted from the previously developed by Gonçalves and colleagues (19) and consisted in three main parts: 1) assessment of knowledge about adequate intake of salt and the relationship between salt consumption and health; 2) evaluation of the concerns about the use of salt, practices and difficulties; 3) sociodemographic data. This questionnaire was originally developed in PT, and was adapted to the Spanish by two steps: 1st translation from PT into SP by an independent researcher; 2nd translation review performed by two independent Spanish native reviewers; and 3rd reconciliation of translations, that is, the synthesis of translations in a version with possible discrepancies resolved.

Statistical Analysis

All analyses were performed using IBM Statistical Package for Social Sciences v.25 (SPSS, Chicago, Illinois, US). Descriptive statistics of the questions were performed. Mann-Whitney and Pearson's chi-square tests were performed to examine differences between the two countries. A p-value of <0.05 was regarded as significant.

Resultados

A total of 36 food handlers (12 from PT and 24 from SP) completed the survey. The SP food handlers were significantly younger ($p=0.034$), and the majority of subjects were female and were chef or kitchen assistant (Table 1).

Table 1. Sociodemographic characteristics of the participants.

	Portugal (n=12)	**Spain (n=24)**	*p*
Age (years)	54.1 ± 10.3	46.1 ± 10.6	**0.034**[a]

Gender			
Male	6 (50.0%)	6 (25.0%)	0.134[b]
Female	6 (50.0%)	18 (75.0%)	
Education level			
Primary education	3 (25.0%)	1 (4.2%)	0.232[b]
Secundary education	2 (16.7%)	5 (20.8%)	
Professional/Bacharelor	7 (58.3%)	16 (66.7%)	
Higher education	0	2 (8.3%)	
Professional category			
Manager	2 (16.7%)	4 (16.7%)	**0.018** [b]
Head or Sous chef	1 (8.3%)	11 (45.8%)	
Kitchen Assistant or Other	9 (75%)	9 (37.5%)	

a Mann-Whitney test | **b** Qui-square test

The large majority had heard or read any information about an adequate intake of salt, recognize the recommended level of daily salt intake and knew that excess salt consumption was associated with high blood pressure, osteoporosis and stomach cancer (Table 2). Significant differences were found in the perception about the level of salt by the population, since PT food handlers considers that the salt consumption of the population is high or very high and SP considers that is average or high (p=0.004). They also differs when chose which factor contributes more to total salt intake, since PT select sausages and smoked sausages (72.7%) and SP select fast food and pizzas (62.5%) (p=0.002). Interestingly, none PT and only a residual quantity of SP food handlers selected the food produced by catering (4.2%).

Table 2. Knowledge related to salt usage.

		Portugal (%)	**Spain (%)**	*p*[a]
Have you heard or read any information about an adequate intake of salt?	Yes	90.9	87.5	0.769
	No	9.1	12.5	
Which do you think is the value of the recommended daily salt intake?	< 5 g/day	63.6	54.2	0.651
	Between 5 and 7.9 g/day	27.3	41.7	
	Between 8 and 10.9 g/day	9.1	4.2	
Do you know any national salt consumption reduction policy?	Yes	66.7	33.3	0.058
	No	33.3	66.7	
Do you consider consumption by the population is:	Very low	0	4.2	**0.004**
	Low	0	0	
	Average	0	41.7	
	High	41.7	45.8	
	Very high	58.3	8.3	
In your opinion, which factor contributes more to total salt intake?	sausages and smoked sausages	72.7	20.8	**0.002**
	cheese	0	4.2	
	food produced by catering	0	4.2	
	homemade food	0	4.2	
	fast food and pizzas	27.3	62.5	
	bakery and pastry	0	4.2	
Is the excessive intake of salt associated with any effects on health: (multiple answers)	enhance health	8.3	0	0.066
	mood changes	8.3	8.3	
	hypertension	91.7	95.8	
	osteoporosis	83.3	54.2	
	stomach cancer	41.7	16.7	
	without influence in health	33.3	0	

a Qui-square test

The majority of participants states that have some concern about the quantity of added salt in foods produced in its catering unit, and 16.7% PT and 22.7% SP recognize that the quantity of salt present in foods produced could be harmful to health of the consumer. However, the majority considers that the level of salt used is beneficial or do not affect the health of the consumer (Table 3).

Regarding the practices related to salt usage by food handlers, the biggest factor indicated to determine the quantity of salt added to foods/meals was the taste of food handler responsible to seasoning the food, the majority assumes usually taste food before and after add salt and agree with one reduction of salt in foods produced.

Table 3. Practices related to salt usage by food handlers.

		Portugal (%)	**Spain (%)**	*p* [a]
Do you have some concern about the quantity of added salt in foods produced in your business unit?	Yes	75.0	56.5	0.283
	No	25.0	43.5	
The quantity of salt present in foods produced in your business unit…	is beneficial to health of consumer	58.3	27.3	0.250
	don't affect health of the consumer	16.7	45.5	
	could be harmful to health of the consumer	16.7	22.7	
	don't have idea about the quantity	8.3	4.5	
What are the most important factors that determine the quantity of salt added to foods/meals produced in your business unit? (multiple answers)	the consumer acceptance	16.7	41.7	0.183
	the price	0	0	
	the taste of food handler responsible	41.7	54.2	
	one usual quantity, measured previously	8.3	41.7	
	other	16.7	0	
Do you usually taste foods **before** adding salt?	Never	0	8.3	0.272
	Rarely	25.0	4.2	
	Sometimes	0	4.2	
	Frequently	16.7	29.2	
	Always	58.3	54.2	
Do you usually taste foods **after** adding salt?	Never	8.3	4.2	0.896
	Rarely	0	0	
	Sometimes	16.7	12.5	
	Frequently	16.7	25.0	
	Always	58.3	58.3	
What do you think about trying to reduce added salt to foods in your business unit?	totally disagree	0	13.6	0.066
	disagree	16.7	13.6	
	indifferent	8.3	13.6	
	agree	25.0	50.0	
	totally agree	50.0	9.1	
If you reduce the quantity of salt usually added to foods, the meals produced would become:	much worse	0	4.5	0.139
	worse	9.1	27.3	
	similar	36.4	50.0	
	better	18.2	13.6	
	much better	36.4	4.5	
In your opinion, what difficulties you may have in salt reduction in your business unit?	opinion/knowledge of consumer	50.0	66.7	0.932
	time spend in reduction	0	0	
	opinion/knowledge of food handlers	16.7	16.7	
	the costs associated	0	0	
	never try	8.3	16.7	
	other	0	4.2	

a Qui-square test

The main difficulty that they waiting to happen in salt reduction was the opinion and/or the knowledge of the consumer. When they think about making a reduction, the majority recognize that was interested in the inclusion of technology or new tools to help the measurement of the amount of salt to be added to meals according to health recommendations (Table 4). The component of the meal identified as more suitable to the reduction of salt was the soup by PT and salads by SP (p=0.013).

Table 4. Approaches to reduce salt.

		Portugal %	**Spain %**	*p* [a]
Would you be interested in using one salt measuring equipment that quickly and easily calculates the amount of salt to be added to meals according to health recommendations?	Yes	90.9	58.3	0.138
	No	9.1	16.7	
	don't know	0	25.0	
What do you think is the component of the meal that could most easily be reduced its salt content	soup	42.9	4.2	**0.019**
	meat	28.6	8.3	
	fish	0	29.2	
	rice / pasta / potatoes / pulses (beans, grain…)	14.3	16.7	
	bread	14.3	4.2	
	salads	0	37.5	

a Qui-square test.

Discusión

This is the first study in ibero countries (North of PT and SP) examining catering workers from university canteens and collecting perceptions and ideas for salt reduction interventions in a university specific setting.

When tailored multilevel intervention programs aiming to improve healthy eating behaviours in university students, the relationships between several components including the physical environment (e.g. availability and accessibility of food products) should be taken into account (20). One study with 964 university students belonging to one SP public university states that the use of meal services (canteens or cafeterias) from university was around 2.3 times per week and the degree of satisfaction with the university meal service was low (21). With this frequency of eating in canteens, is natural that the caterer's role in healthy eating is becoming increasingly important and recent research has shown that consumers believe it is the responsibility of the caterer to provide healthy choices (22).

This responsibility for providing healthier meals appears to be present in the health policies of the two Iberian countries. The Spanish Network of Healthy Universities (REUS) supported by the Ministry of Health, the Ministry of Education and some autonomous departments of Public Health, was established in 2008 with the aim to strengthen the role of universities as institutions promoting the health and welfare of their students, staff and society as a whole, including the promotion of healthy diet (23, 24). In Portugal, the Ministry of Health through the National Programme on Food and Nutrition promotes since 2019 the Excellence Seal project "Healthy Eating in Higher Education" within the scope of the Integrated Strategy for the Promotion of Healthy Eating (EIPAS), containing some guidelines for food in the university context

(25, 26). However, as previous studies showed that meal provision to students could have excess of energy and salt (9, 27), the healthy eating policies implementation to be successful need to be holistic and integrate all stakeholders, such as food handlers (6).

If on the one hand, consumers seem to attribute responsibilities to the caterer; on the other hand the food handlers indicate that they do not feel a social responsibility to limit public salt consumption, pointing out the lack of consumer interest and the fear that any salt adjustment would change the food's sensory acceptability putting them at a competitive disadvantage (28).

The results of the present study give new insights about the knowledge, practices and possible approaches to reduce salt through the perspective of food handlers from university canteens.

Chefs of both countries exhibited good level of daily maximum level of intake and health impacts of excessive consumption. These results are in line with other study performed with 68 chefs and food handlers from Portuguese catering industry, where 80.3% recognized the maximum advised level of salt intake (19). However, other studies showed that chefs had little nutritional understanding of the health impacts of salt intake (28). In fact, since in the training of chefs much specific nutrition content was scarce or inexistent, it was expected that chefs had a similar level of understanding about salt and sodium to that of the general public (29, 30).

The perception of salt intake by the population was different between the PT and SP food handlers, being perceived by the PT that the population have most exaggerated intake. The Portuguese adult population salt consumption is 10.7 g/d (31) and the Spanish is 9.8 g/d (32), considering the last published studies with one representative sample of the population through one single 24-hour urinary collection, the gold standard method for the estimation of dietary salt intake.

Although the food handlers studied do not consider food produced by catering as a considerable contributor to total salt intake by the population, and the majority considers that the level of salt used in their catering unit do not harmfully the consumers health, they agree with the reduction of salt in foods produced. One study with PT chefs and food handlers shows that 70.6% agree with the reduction of added salt to meals in their units (19). But, other previous studies showed that chefs had strong reluctance to make any reductions in salt use in their daily operations (28, 29), or they were willing and able to reduce sodium content in meals if customer demand could be maintained and showed a need to provide education, strategies, and support to food handlers in preparing low-salt dishes (33).

This study also pointed in this direction, the main difficulty that food handlers have indicated to salt reduction was the opinion and/or knowledge of consumer followed by the opinion and/or knowledge of the food handler responsible for the salt addition.

In one study with 50 chefs from UK, about one fifth of the chefs admitted to adding salt to foods before they tasted them, and about three fifths of the sample said they added salt to taste, or "when necessary". This depends on the chefs' palates, which tend to be less sensitive due to regular exposure to salt. In addition, most of the chefs ate out regularly, and so were well accustomed to restaurant food (29). The good practices related to salt addition includes taste food before add salt (to assess the need for salt), add salt after all other ingredients, and taste food after the addition of salt (to assess the final salty taste, and correct if necessary). In our results, a

noteworthy number of participants assumes that never and rarely tastes food before and after add salt.

Although consumers assume that they are increasingly looking for healthier food products, the biggest choice factor remains taste. This ambivalence between the beliefs and the behaviours, pressure the chefs to develop innovative culinary techniques, with tasty but also healthy dishes. Therefore, it is in this field that there is a good opportunity for the intervention of dietitians, to provide nutrition education, to empower chefs to develop a healthful menu (34).

To future intervention seems that soups and salads were the bigger candidates to more easily salt reduction (19), and new technologies and equipment to easily and quickly help to calculate the amount of salt to be added was interesting to the large majority of food handlers.

The results of this study provide valuable insight into the many factors that influence salt usage and the opinions of chefs regarding salt reduction possibilities. This survey could be an important first step in the development of strategies for bringing canteen meals more in line with the WHO recommendations to achieve bigger health goals.

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