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Research report

Perceptions of university students regarding calories, food healthiness, and the importance of calorie information in menu labelling ☆



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ABSTRACT

This study investigated Brazilian university students' perceptions of the concept of calories, how it relates to food healthiness, and the role of calorie information on menus in influencing food choices in different restaurant settings. Focus groups were conducted with 21 undergraduate students from various universities. Transcriptions were analysed for qualitative content, by coding and grouping words and phrases into similar themes. Two categories were obtained: *Calorie concept and connection to healthiness*; and *Calorie information and food choices in restaurants*. Calories were understood as energy units, and their excessive intake was associated with weight gain or fat gain. However, food healthiness was not associated to calorie content, but rather to food composition as a whole. Calorie information on restaurant menus was not considered enough to influence food choices, with preferences, dietary restrictions, food composition, and even restaurant type mentioned as equally or more important. Only a few participants mentioned using calorie information on menus to control food intake or body weight. Students' discussions were suggestive of an understanding of healthy eating as a more complex issue than calorie-counting. Discussions also suggested the need for more nutrition information, besides calorie content, to influence food choices in restaurants.

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Introduction

One of many strategies proposed to decrease obesity rates and related chronic diseases worldwide is menu labelling (Burton, Creyer, Kees, & Huggins, 2006; Malik, Willett, & Hu, 2013). In the United States, the Patient Protection and Affordable Care Act of 2010 requires the disclosure of calorie information on menus of all chain restaurants with 20 or more outlets (USA, 2010a). In the United Kingdom, the government's Responsibility Deal (food pledges) includes the provision of calorie information in out-of-home settings (UK, 2011). Similar initiatives have emerged in various countries (McGuffin et al., 2013). In Brazil, big fast-food chains already

disclose calorie information on menus, and some municipal and state regulations on menu labelling are also being implemented (Oliveira, Proença, & Salles, 2012).

The main focus of menu labelling public policies as a way of fighting obesity has been the energy content of food (USA, 2010a; UK, 2010; Oliveira et al., 2012). Although obesity is a multifactorial disease, an imbalance between energy intake and expenditure is commonly cited as its only cause (Hall et al., 2012). However, beyond calorie imbalance, causes of obesity include metabolic-disturbing behaviours and dietary products which promote lipogenesis (Simopoulos, Bourne, & Faergeman, 2013; Wells, 2013).

How calorie information is understood at a deeper level by consumers is yet to be determined. Evidence of consumers wanting calorie information in spite of not understanding the meaning of "calorie" has been uncovered, as well as the infrequent use of this information when eating in restaurants by those who claim to understand the concept (Burton & Kees, 2012; Krukowski, Harvey-Berino, Kolodinsky, Narsana, & DeSisto, 2006; Watson et al., 2013).

Conflicting results have been reported concerning the effect on food choices of calorie information displayed on restaurant menus. Some studies have reported that consumers indeed chose

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lower-calorie options when information was given, but also considered the low-calorie options to be healthier. Other studies, however, have claimed that evidence of calorie information reducing calorie intake or promoting overall healthier choices in restaurants was lacking (Burton et al., 2006; Harnack & French, 2008; Sinclair, Cooper, & Mansfield, 2014; Swartz, Braxton, & Viera, 2011).

It has been suggested that the aim of menu labelling policies should move from the reduction of obesity rates towards healthy eating in general (Loewenstein, 2011), since food healthiness involves food patterns as well as synergistic interactions among nutrients and other food constituents (Simopoulos et al., 2013; Wells, 2013). Healthy eating is much broader and more difficult to define, and not necessarily at odds with reduced caloric choices.

Moreover, not many studies have explored the meaning of calorie information as understood by consumers. Only one qualitative study about consumer understanding of energy terms and its relationship with healthy eating has been identified, but that study focussed only on food product labels. The research with 40 Australian adults revealed that consumers who read the nutrition information on product labels considered higher energy products to be healthier because they provide sustained energy (Watson et al., 2013).

Consumer research studies usually focus on teenagers and adults – not much attention is given to the situation of young adults in their transitional life phase as university students. This period is characterized by the transition from eating with parents at home to planning and preparing their own meals at their new homes (Blichfeldt & Gram, 2013). Such changes may lead to lower consumption of fruits, vegetables, meats and fish; higher consumption of fast food, sugar and alcohol; and weight gain (Papadaki, Hondros, Scott, & Kapsokafalou, 2007; Pelletier & Laska, 2013; Vella-Zarb & Elgar, 2009).

Only one study addressing perceptions and choices of university students who received nutrition information in restaurants was identified. Students who ate at a North-American university canteen which provided information on serving size, ingredients, calorie, sugar, fat, carbohydrate, protein, sodium, cholesterol and trans fat content were surveyed. Most of them (88%) reported that nutritional information could eventually affect their choices; only 39% reported actually using the information. Despite considering the available information to be excessive, students acknowledged that calorie information alone would be insufficient. They stressed the importance of displaying a list of ingredients and fat content (Martinez, Roberto, Kim, Schwartz, & Brownell, 2013).

Few studies were identified which dealt with the issues being proposed here, but using different approaches. Some were quantitative (Lee, Fowler, & Yuan, 2013; Wie & Giebler, 2014; Yang & Heo, 2013), others explored different issues regarding menu labelling (Feldman, Hartwell, & Brusca, 2013) or were conducted with adults in general (Carels, Harper, & Konrad, 2006; Lando & Labiner-Wolfe, 2007).

The aim of the present study was to qualitatively investigate Brazilian adult university students' perceptions of the concept of calories, how it relates to food healthiness, and the importance of calorie information on menus in guiding food choices within different restaurant settings.

Methods

Since the primary interest of this study was to capture the diversity of opinions in specific and uncontrolled contexts (Neutens & Rubinson, 2002), the focus group technique was chosen. Nutrition research frequently employs this technique to explore and understand perceptions, behaviours and attitudes towards food (Feldman et al., 2013; Jones, 2010; Schindler, Kiszko, Abrams, Islam, & Elbel, 2013). Focus groups allow interaction and in-depth discussions, which in turn provide richer data than those obtained by

surveys or individual interviews (Krueger & Casey, 2009; Sofaer, 2002).

Participants were recruited using student mailing lists from Universities in a state capital in Southern Brazil. Online advertisements contained a link to the registration form, allowing eligible students to be contacted by the research team. Participants were required to be Portuguese-speaking undergraduates aged over 20 years, who eat out at least once per week, and are not enrolled in any kind of food or nutrition programme. Groups were designed to include four to eight participants and additional students were enrolled to compensate for withdrawals. Recruitment was discontinued once the same themes continued to emerge across groups and when participants no longer contributed new themes to the overall discussion (Krueger & Casey, 2009). This occurred after the third group, and even then one more group was conducted to ensure complete data saturation. All students provided informed consent before participating. Research protocol was approved by the institution's Ethics Committee.

Focus groups were conducted in November 2013, with six, five, six, and four participants, respectively, each lasting on average 50 minutes. A moderator led all the discussions while two observers took notes. At the beginning of each session, the moderator outlined the aims of the study to the participants, explained how the activity would be conducted and how the data would be managed, assuring confidentiality. Participants were instructed to give honest and straightforward answers about what they thought and did, since as the study was about perceptions, there could be no right or wrong answers. A semi-structured guide (Fig. 1) with open-ended questions was employed (Krueger & Casey, 2009). At the end of each session, participants completed a brief questionnaire about their weight, height and any dietary restrictions.

Audio from the focus groups was recorded and transcribed by the moderator, incorporating notes taken by the observers. Transcription was then analysed for content, with codification only starting after the transcript was carefully read three times by the moderator. Codification consisted of highlighting segments of text that reflected different ideas in order to identify and merge issues into themes and overarching categories (Hsieh & Shannon, 2005; Onwuegbuzie, Dickinson, Leech, & Zoran, 2009). To ensure reliability, categorization was repeated by the moderator one month after the initial codification. Discrepancies between the first and second categorization were reviewed and refereed by a second researcher, and agreed upon by all authors after careful and detailed discussion.

Results

Participants' overall characteristics

Twenty-one students (Table 1) from four different Universities participated in the focus groups. More than half were female (12); 10 had normal BMIs while 10 were overweight. They were enrolled in 13 different undergraduate degree courses. Nearly half reported dietary restrictions (43%), including vegetarianism (60%), lactose intolerance (20%), self-guided dieting for weight control (10%) and avoidance of fried foods (10%).

Categories and themes from focus groups

Data analysis led to themes being organized into two categories: *Concept of calories and their connection with healthiness* and *Calorie information and food choices in restaurants*. Categories, themes and examples of quotes are presented in Table 2.

Concept of calories and their connection with healthiness

Most students defined calories as a synonym for energy or fuel; some related the excessive intake of calories to body fatness and

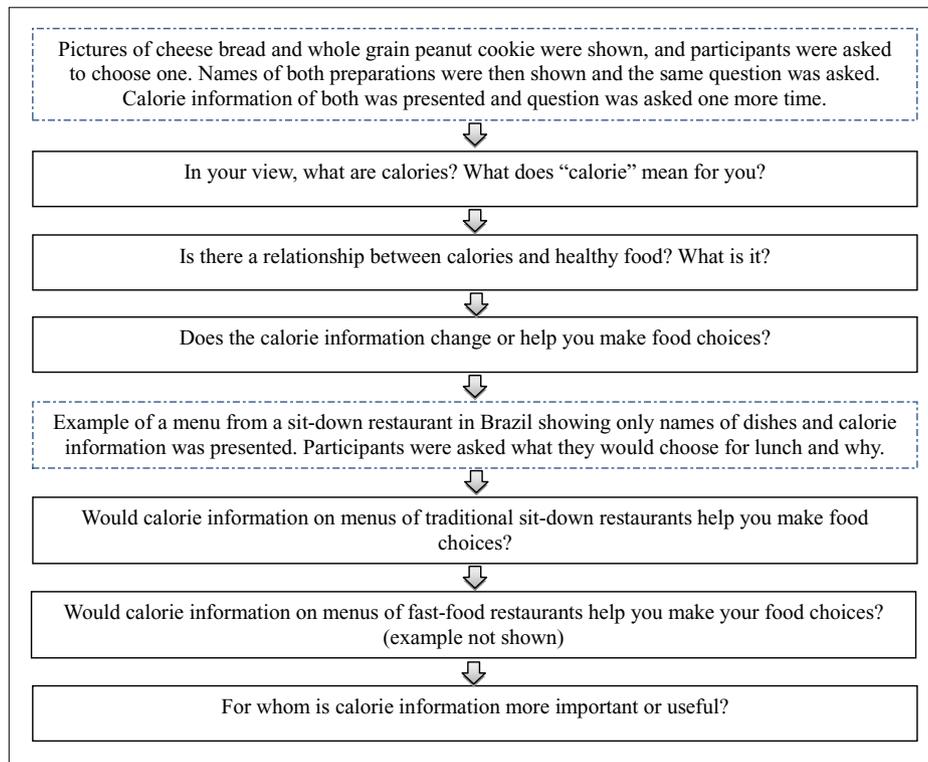


Fig. 1. Semi-structured guide used to conduct focus groups with Brazilian university students about calorie labelling in restaurants and food choices.

weight gain. In three of the four groups, participants spontaneously started talking about the disconnection or weak connection between calories and food healthiness. When asked specifically about the relationship between calories and healthiness, most participants mentioned that one was not associated with the other. Students associated food healthiness with being natural, containing whole ingredients, being rich in fibre, vitamins, and minerals, employing few ingredients, not being processed, containing fat from a vegetable source, and little amounts of additives and sodium.

Also, in every group participants mentioned high-calorie foods and drinks – such as peanuts, avocado, and fruit smoothies containing fruit, milk, and oats – as examples of healthy foods. However, other high-calorie foods and drinks, such as hamburgers, ice cream, and soda, were considered unhealthy. Some participants associated food healthiness with being low-calorie foods, arguing that this relationship applies to a lot of foods. Discussion about satiety not

being associated with calorie content, but instead with food healthiness and fibre content, spontaneously emerged in one group.

Calorie information and food choices in restaurants

Most participants considered calorie information to be of no help when making food choices in general or specifically in restaurants. According to the students, personal preferences, dietary restrictions and types of restaurants mattered more. For instance, fast food restaurants were described as places for infrequent indulgence, where calorie information was less important. Students also indicated that other information besides calorie content was more important in restaurant settings. Many quotes were obtained about examples of further important information to be disclosed in restaurants, with food and/or nutritional composition cited most frequently. But participants considered it even more important for schools and universities to give classes about healthy eating.

Some discussions revolved around the idea that it was better to have calorie information available in restaurants than no information at all, since it could be useful for different people in different situations. Students considered calorie information important for consumers in general, if not for themselves. Some of them insisted on the idea that calorie information would only help them make food choices if complemented with additional information, while others acknowledged that it would depend on the moment and mood of the day. Also mentioned was the fact that standardized portions could allow people to use the information to compare similar food products at markets, or similar dishes in restaurants.

When discussing who might benefit from calorie information, participants mentioned that it would depend on the type of consumer, such as those with a knowledge of the significance of calories, those with health problems, nutritionists, dieters or those 'obsessed' with calorie counting.

Table 1
Characteristics of participants in focus groups on calorie labelling in restaurants and food choices (N = 21).

	n	%
Sex		
Female	12	57
Male	9	43
BMI^a		
Underweight	1	5
Normal range	10	47
Pre-obese	9	43
Obese	1	5
Dietary restrictions		
No	12	57
Yes	9	43

^a BMI = Body Mass Index calculated from reported weight and height and classified according to the World Health Organisation (WHO) – http://apps.who.int/bmi/index.jsp?introPage=intro_3.html.

Table 2
Categories, themes and quotes of university students' perceptions about the concept of calories and information, health and food choices in restaurants.

Categories	Themes	Quotes
Concept of calories and their connection to healthiness	Calories are connected with energy and fuel to the body. Calories are connected with energy balance and its excessive intake is associated to fatness and weight gain. Spontaneous disconnection or weak connection between calories and food healthiness/food quality. Food healthiness is not just about calories.	<p>"It is energy to the body. It is how much energy the food is supplying." "If the food is very caloric and I do not spend the calories, they will turn into fat."</p> <p>"Energy is not necessarily related to food quality."</p> <p>"Calorie information is not enough for us to consider whether it (the food) is healthy or not."</p> <p>"Healthy food is what it is, and calories are how much [energy] it has. It is difficult to say without [knowing] the ingredients. . ." "Healthy food has to do with the type of fat used... [and] depends on the industrial processing."</p> <p>"Nuts have lots of calories, but they also have minerals and polyunsaturated fat, which are very beneficial for the body."</p> <p>"(...) I was satisfied with fewer calories than if I ate sweets, or a cake. I think it had to do with the fibres."</p> <p>"I think that sometimes calories match a lot with whether the food is healthy or not. They usually match. Like the tomato, which is low-calorie and is healthy, while the potato mayonnaise salad has mayonnaise, which is more caloric."</p>
	Food healthiness is not associated with calories but with type of fat, with food not being processed, with being natural or whole, and with the ingredients and/or sodium.	
	Examples of high calorie foods that are healthy.	
	Satiety is not associated with the calorie amount.	
	Association between food healthiness and low-calorie foods.	
Calorie information and food choices in restaurants	Calorie information does not help when making food choices in restaurants: There are other issues that matter especially preferences, dietary restrictions and the types of restaurants.	<p>"If I could choose I would rather eat less meat..." "In a fast-food outlet, I would not ask to see [calorie information]. It is a place that I go to eat mainly for the taste."</p> <p>"It [calorie information] does not help me. ...interests me much more to know the ingredients or how the food was prepared, as well as the amount of sodium and if it is made from whole grain." "It is better to discuss what healthy eating is [at schools] than to simply show the amount of calories [in restaurants]."</p>
	Further food and nutrition information are more important in restaurants.	
	Information on healthy eating as a whole in schools and universities is more important than menu labelling. Calorie information can help when making food choices in restaurants: Only as a supplement to other nutrition information.	<p>"[Calorie information helps] only if you have more info. We can take into account the sodium, saturated fat, that sort of thing. The calorie information alone is too little, you cannot make a conclusion whether it is good for you or not." "Now at the end of the (university) semester I would not change my choice." "It depends on the mood; there are days when we want to pig out anyway." "If the person is very worried about calories, if it is neurotic, the calorie information will help." "If there is calorie information I will have a guilty conscience you know [I will think]: 'all this!'" "It [calorie information] would be better if it was per 100 g. I think [calorie information] like this helps." "It [calorie information] is more for thinking, for information, for people to know."</p>
	Depending on the time of year (season or time of the semester) or the person's mood on the day. For those who understand what calories are; those on a diet; who are neurotic about diet or have health problems. Calorie information could scare other consumers.	
	Only if it were possible to compare the same food or same portion sizes. To inform consumers and to continue nutrition education. Calorie information helps when making food choices in restaurants: To decrease the calorie or food amount consumed, to stop eating some foods and to compensate with exercise or less caloric foods.	

The participants who admitted that calorie information helped them make food choices mainly did it when asked in a general context, mostly regarding food purchases at the supermarket. Few comments were obtained when students were asked about the influence of calorie information in restaurants. These students reported that calorie information in restaurants could help them to decrease the amount of food ordered, to avoid eating a certain food, or to compensate either by exercising or by consuming smaller amounts of high-calorie food items in meals.

Discussion

The key finding of this study was that most participants had concepts of healthy eating which goes beyond calories, mentioning ingredients, level of processing, and nutrient composition as more important. This concept of healthy eating was apparently not considered in initial menu labelling policies, although it is consistent with the definition of a healthy diet by the World Health Organisation (WHO, 2014). Food guides and similar initiatives around the world focus on food components, food groups, nutrient composition and

healthy eating patterns rather than on calories (Brazil, 2014; EUFIC, 2009; FAO, 2009; Ge, 2011; USA, 2010b).

One of the main reasons mentioned by the students for not considering calorie information when eating in restaurants was that they perceived a disconnection or weak connection between calorie content and food healthiness. They reported being more interested in information which could lead to a healthy diet, as opposed to a low-calorie diet. This view is in alignment with results reported by other authors and with published scientific evidence that diet planning based solely on calorie content is insufficient to promote good health and nutrition, and even to fight obesity, since obesity is not a simple function of caloric intake (Cohn, Larson, Araujo, Sawyer, & Williams, 2012; Simopoulos et al., 2013).

Participants reported that calorie information would only contribute to their food choices if supplemented by information on ingredients and/or nutrients. Similarly, a survey conducted with North-American university students identified that ingredient composition and portion size were more relevant than the amount of calories when choosing a restaurant meal (Avcibasoglu, Cardinale, Dommeyer, Lebioda-Skoczen, & Schettig, 2011). A survey with British

consumers identified that the most valued information at six different types of food service outlets was the list of ingredients, followed by energy and fat content (Mackison, Wrieden, & Anderson, 2009).

Participants mentioned that taste and food preferences guided their choices especially when eating out for pleasure, a result similar to the ones obtained by a focus group study with Belgian university students (Deliens, Clarys, De Bourdeaudhuij, & Deforche, 2014).

As for the answers obtained regarding restaurant type, it seemed that food choice had already been predefined at the time when students chose where to eat. Similar behaviour was observed in studies with university students from Arkansas, USA, (Burton, Howlett, & Tangari, 2009), and reported by mothers and elderly people (Jones, 2010).

In this study, students indicated that the helpfulness of calorie information was limited to certain groups of people, such as dieters or nutrition experts. It has been demonstrated that among users of calorie postings in restaurants, women, people of Latin background, obese individuals, dieters and those already aware of calorie information on food products are more motivated to seek and understand nutrition information (Bates, Burton, Howlett, & Huggins, 2009; Lando & Labiner-Wolfe, 2007).

In our study, students stressed the importance of teaching nutrition skills at schools and universities. According to systematic reviews and interventional studies, nutrition education programmes in schools indeed seem to be effective not only in improving student knowledge about healthy eating, but also in increasing fruit and vegetable consumption and reducing BMI (Silveira, Taddei, Guerra, & Nobre, 2013; Suarez-Balcazar, Kouba, Jones, & Lukyanova, 2014).

Nevertheless, we highlight the importance of calorie information availability for allowing consumers to make informed choices, even if it does not lead to a reduction of obesity levels. Recognizing the importance of evidence on the complexity of eating behaviours leading to obesity (Roberts, Urban, & Das, 2014; Simopoulos et al., 2013), it seems advisable to acknowledge that informative policies alone may not completely change consumer behaviour. Other changes in restaurant settings – such as reducing portion sizes, making healthier items the default option, and modifying the internal restaurant architecture – may be necessary to achieve meaningful reductions in obesity and diet-related disease rates, as well as to promote health (Deliens et al., 2014; Liu, Wisdom, Roberto, Liu, & Ubel, 2014; Loewenstein, 2011).

We acknowledge that this study has limitations. Because it is a qualitative study that considers the views of only a small number of subjects, results cannot be generalized. The study did not aim to verify whether or not calorie information led consumers to make healthier food choices, but gathered their opinion on whether this could be the case. Appropriately, the focus group technique was employed to understand perceptions and reflect a diversity of opinions, not to draw generalizations (Krueger & Casey, 2009). Although focus groups were conducted in only one Brazilian city, university students have similar characteristics worldwide, potentially allowing the use of the current results to discuss perceptions about calorie information among university students in general. Finally, the participants were volunteers, who may have been more interested or knowledgeable about the topic than other students. University students also represent a more educated sample and this can affect the understanding and use of nutrition information. Nevertheless, none of the students were nutrition graduates and there was variety in degree subjects and universities, as well as heterogeneity regarding sex, dietary restrictions and self-reported BMI.

To our knowledge, this is the first qualitative study examining university students' perceptions of calorie information in restaurants that also explores the concept of calories and the relationship between calories and food healthiness. This relationship is rarely

discussed as a starting point for the development of menu labelling policies, and is not deeply explored from the consumers' viewpoint. The role of different restaurant scenarios in consumer choice was also examined. We highlight the importance of discussions considering nutrition education and other interventions in schools and universities in order to improve the use of menu labelling.

To complement our results, further focus group studies exploring university students' preferences regarding menu labelling information should be conducted, as well as experimental studies in real settings, testing such information. Therefore, future experimental studies which compare different restaurant settings could be carried out.

Conclusion

This study highlighted the fact that most university students hold a view of healthy eating which goes beyond calorie levels, encompassing types of ingredients, food processing techniques and nutrient content. Nevertheless, calorie labelling in restaurants was deemed to be better than having no information at all, since it could be useful as an educational tool to supplement other information or to help people who are already calorie-counters. Calorie labelling was considered helpful – by few students – to control energy intake in sit-down restaurants, but not in fast food places. However, according to the respondents' view, in both types of restaurants further information besides calorie content would be more helpful to guide food choices.

Results suggest that energy content information as the main focus of menu labelling policies should be reconsidered as it is unclear whether adults use it to make healthier choices. Information on ingredients, fat type and sodium content could be supplementary or more important to the consumer. Moreover, consumer's rights should be warranted beyond simply calorie information, since they are entitled to know what they are eating (e.g. ingredients).

Further research could be conducted to explore university students' perceptions in other countries, but based on the present results, different approaches to menu labelling could be adopted by university canteens.

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