Research Article

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Perceived Healthiness of Breakfasts in Women with Overweight or Obesity Match Expert Recommendations

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Abstract: The aim of the present study was to examine the perceived healthiness of breakfasts and the underlying beliefs influencing that perception against expert nutritional evaluation. Women with overweight or obesity (N = 120) were asked to recall the food items they consumed during a recent "healthy" or "unhealthy" breakfast. They also reported why the breakfast was healthy or unhealthy and rated its healthiness. Two nutritionists categorised the beliefs about why the breakfasts were "healthy" or "unhealthy" and evaluated the healthiness of each breakfast following nutrition guidelines. Generally, the meals considered as healthy versus unhealthy breakfasts and related beliefs about why the breakfasts were healthy or unhealthy matched food-based nutrition guidelines. Participants were found to perceive healthy breakfasts as more healthy and unhealthy breakfasts as less healthy than nutritionists did. Participants frequently mentioned the belief that their breakfast was healthy because "it contained fruit" or that their breakfast was unhealthy because "it contained fat." Such salient healthy or unhealthy food items may guide the perception of breakfast healthiness and could be a target for nutrition counselling.

Keywords: beliefs; food healthiness; breakfast; episodic memory; obesity

Introduction

The present study aims to compare the perceived healthiness of eating episodes with evaluations made by nutritionists. We review research showing how beliefs about food-related factors can influence the perception of how healthy a food item is and how this can create a potential mismatch between the perceived healthiness and the objective nutritional profile of an eating episode. Specifically, we examine breakfast episodes perceived as healthy or unhealthy by women with overweight or obesity. For this purpose, the present study scrutinises the recent memories of typical eating episodes reported by individuals.

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Individuals' perception of food healthiness

The perception of food items that individuals consume at meals as healthy or unhealthy is consistent with food-group based dietary guidelines and expert opinion (Cloutier, Mongeau, Pageau, & Provencher, 2013; Laguna-Camacho & Booth, 2015; Larkin & Martin, 2016). However, beyond this simple categorisation of healthy or unhealthy foods one can also assess the extent to which individuals perceive a food item to be healthy or unhealthy, a measure known as "perceived food healthiness" (Provencher, Polivy & Herman, 2009; Provencher & Jacob, 2016).

Some characteristics of food items may lead to perceiving them as more or less healthy or unhealthy (Brown-Kramer, Kivinemi, & Winseman, 2009). For instance, people rate some foods (like apples) as healthier than other foods (like potatoes) in spite of both foods being nutritious (Cloutier *et al.*, 2013; Oakes & Slotterback, 2004). The perceived degree of healthiness or unhealthiness may depend on the salience of specific food names or components. For example, people rate high-fibre food as healthier than low-fibre food, and high-fat food as less healthy than low-fat food (Rizk & Treat, 2015). Similarly, while fruit, vegetables, and fibre relate to perceived food healthiness, sugar and fat relate to perceived food unhealthiness (Bucher, Müller, & Siegrist, 2015). Furthermore, people perceive lower vitamin content to foods high in sugar and fat (Oakes, 2004). In addition, people may rate healthiness of a food item guided by its name more often than on the basis of nutrition information regarding it (Oakes, 2006; Oakes & Slotterback, 2001). This would indicate that labelling food items as healthy or unhealthy can occur, at least in part, regardless of their nutritional value. In line with this possibility, cereal with the label "fruit sugar" was perceived as healthier than the same cereal with the label "sugar" (Sütterlin & Siegrist, 2015).

Having salient healthy or unhealthy foods as a part of a meal could thereby skew one's perception of the healthiness of that meal as compared to its actual nutritional profile, particularly in case less salient food items are overlooked. This cognitive influence relates to the well-known "health halo" effect that refers to underestimating the calorie content of main dishes or to opting for high-calorie dishes when a food outlet claims to sell healthy food (Chandon & Wansik, 2007). Indeed, people have the tendency to rate healthy foods as lower in calories than they actually are and do the opposite for unhealthy foods (Carels, Harper, & Konrad, 2006; Carels, Konrad, & Harper, 2007; Larkin & Martin, 2016). Interestingly, one study has shown that individuals estimated the calorie content of a meal to be lower when it was served with a healthy side dish (salad) than when the same meal included an unhealthy side dish (cookies) (Chernev & Gal, 2010). The belief that a food is high or low in calories or that it contains a "healthy" (i.e. fiber, vitamins) or an unhealthy (i.e. sugar, fat) nutrient factor seems to influence the perception of how healthy or unhealthy a meal is. In accord with this, the perceived healthiness of meals has been shown to be related to the presence of particular food factors (such as fruit, vegetable, fiber, protein, energy density, sugar, and sodium) but unrelated to the amounts of foods of the same meals (Bucher *et al.*, 2015).

In addition, people may assume what normal food amounts are on the basis of portion sizes that they see in their surroundings (Robinson & Kersbergen, 2018). A portion size evaluated by nutritionists as "large" could also be perceived by someone as "medium" because this may be the portion size that is normally served in his/her social group. There are inconsistent associations between perceived portion size and body mass index (BMI) (Brunstrom, Rogers, Photos *et al.*, 2008; Burger, Kern, & Coleman, 2007; Labbe, Rytz, Brunstrom, Forde, & Martin, 2017), which backs up the fact that how much we eat is not entirely a function of biological needs. Thus, people may be influenced by salient names, components or visual nutritional information that could generate discrepancies between their judgments with regard to the healthiness of meals and the objective measures used by the nutritionists (i.e. number of portions, calories, nutrients, etc.).

Memories of eating episodes

Perception of eating behaviour in naturalistic settings can be explored through the recall of episodic memories. Previous research indirectly showed that autobiographical memory is useful for examining eating behaviour. For instance, a study found that in response to dieting-related cue words dieters reported autobiographical memories with more weight- or body-related elements than non-dieters (Johannessen &

Bertsen, 2009) and discussed that memories were related to current goals and concerns (i.e. losing weight). This would show that autobiographical memory is consistent with the behavioural patterns of dieters and non-dieters respectively. A similar study found that people with dieting concerns who were asked to think about positive and negative aspects of fulfilling their goals to eat healthier or lose weight reported after two weeks that they consumed less high-calorie foods and more low-calorie foods as compared to the time when they did not engage in such mental contrasting (Johannessen, Oettingen, & Mayer, 2012). Therefore, it can be implied that some ways of gathering information on eating healthy or losing weight could influence individuals' responses. To prevent that bias, the Cognitive Interview technique is recommended to obtain a free report on a past autobiographical event using non-leading prompts to guide its reconstruction in memory (Armstrong, McDonald, Booth *et al.*, 2000; Knibb & Booth, 2011; Laguna-Camacho & Booth, 2015).

Two previous studies used episodic memories to examine the content of everyday meals and their associations with internal or external factors. One of the studies looked at the recall of eating episodes that were followed by the symptoms of food intolerance and made a distinction between the episodic recall of specific food items consumed versus general beliefs held of these foods that were not based on any particular episode (Knibb & Booth, 2011). Another study was carried out to find out if the foods recalled with regard to recent eating occasions were perceived as healthy or unhealthy in accordance with food-based guidelines and its results confirmed this for fruit, vegetables, sugar, fat and alcohol (Laguna-Camacho & Booth, 2015). Besides these studies, we are not aware of other research in which people were simply asked for memory accounts of their recent eating occasions. Individuals can reliably recall such aspects of the activities they carried out in the preceding week as place, time, people present, and objects which they interacted with (Armstrong *et al.*, 2000; Kristo, Janssen, & Murre, 2010; Skowronski, Thompson, Betz *et al.*, 1991). Therefore, such an approach has the potential to directly access the aspects of eating episodes as perceived by individuals in their everyday life.

The current study

The aim of the present study was to examine the perceived healthiness of everyday meals and the beliefs behind such individual perceptions. Specifically, we focused on breakfasts perceived to be healthy or unhealthy by women with overweight or obesity. Breakfast is a meal potentially relevant for maintaining healthy weight (i.e. Leidy, Gwiin, Roenfeldt *et al.*, 2016). Despite consistent evidence showing no difference in the perceived healthiness of foods in relation to weight status (Oakes & Slotterback, 2001; Rizk & Treat, 2015), a few studies from a different research line including women with overweight or obesity do report mixed findings as far as their ability to judge portion sizes of food items or meals is concerned (Burger *et al.*, 2007; Brunstrom *et al.*, 2008; Labbe *et al.*, 2017). This indirectly provokes the question that if women with overweight or obesity misjudge food amount visually, this would skew their perceived healthiness of meals from an objective nutritional perspective. Such a potential mismatch between the perceived healthiness and the actual nutritional profile of breakfast gives cause for concern as it could contribute to the exacerbation of the nutrition-related health risks in women with excessive adiposity, among whom poor eating practices are prevalent (Laguna-Camacho, Castro-Nava, & López-Arriaga, 2017).

To address this, the memories of recent healthy and unhealthy breakfasts eaten by participant women with overweight or obesity were evaluated in the present study. Many beliefs about healthy and unhealthy food may develop from food-group based dietary guidelines disseminated among the general public (Brown, Timotijevic, Barnett *et al.*, 2011). Thus, our first hypothesis was that food items reported in healthy and unhealthy breakfasts would be consistent with the food groups adopted in the dietary guidelines (Hypothesis 1). However, because salient healthy or unhealthy foods would be likely to influence the perceived healthiness of breakfast (Cloutier *et al.*, 2013; Oakes & Slotterback, 2004), the present study also examined the degree to which the perceived healthiness of the breakfast reported by participants corresponded with the evaluation of those breakfasts made by nutritionists. Our second hypothesis was that participants would overrate the healthiness of healthy breakfasts and minimise the healthiness of unhealthy breakfasts as compared to nutritionists' ratings (Hypothesis 2). In addition, we assessed if the above associations differed by weight ranges (overweight vs. obese) or by neighbourhoods (urban vs. semi-urban).

Method

Participants

The participants were 120 adult women (mean age: 31.6 ± 4.6 years, mean BMI: 30.0 ± 3.8 kg/m^2) including persons with overweight (54.2%) or obesity (45.8%) from two urban/semi-urban neighbourhoods. The researchers delimited the area of each neighbourhood using a satellite image from Google maps and consecutively numbered the houses of all streets. Sixty houses from each neighbourhood were then selected by probabilistic sampling with the use of an online tool (randomizer.org). The numbered houses were allocated to each condition in an alternated sequence; the conditions involved talking about either healthy or unhealthy breakfast. Eligibility criteria included being female, between 18 and 60 years of age, and having a BMI above 25 kg/m^2. Exclusion criteria included having chronic illnesses and/or being on a diet. Potential participants were informed that the study involved completing an anonymous questionnaire that explored the characteristics of eating practices in their neighbourhood. Participants provided informed consent. The study protocol was approved by the Ethics Committee of the Medical Sciences Research Centre of the Autonomous University of the State of Mexico.

Procedure and measures

A female researcher approached each preselected house in the morning and screened women for eligibility on the basis of the criteria described above. If the resident of the preselected house failed to respond, did not give their consent or was ineligible, the next house was approached. This procedure was repeated until the approached woman agreed to take part. Women who agreed to take part in the study received one version of the study questionnaire and were asked to provide a written description of a recent episode when they had consumed either a healthy or an unhealthy breakfast along with their belief about why that breakfast was healthy or unhealthy. They were also asked to provide their age, education level, occupation, weight, and height.

Breakfast episode. The Cognitive Interview technique was applied to facilitate the recall of the healthy or unhealthy breakfasts. Prompts were provided in the form of open-ended questions about the foods consumed, their rough amounts, the place where they were eaten, the time of the day on which the consumption occurred, the number of people present and their relationship with the participant.

The reported foods were classified into the groups of fruit, vegetables, grains, high-protein food (protein), and dairy, which are all used in public educational tools such as the Eatwell plate in México (NOM, 2012) and UK (Boylan & Levy, 2014) or the myPlate in USA (USDA, 2015). Additionally, water, sugar, and fat were distinguished, along with the estimated number of portions of food from each category (Laguna-Camacho, 2009; Whybrow, Macdiarmid, Craig, Clark, & McNeill, 2016). The place where the participants ate the breakfast was categorised into *home* or *away from home*. The people present were classified as *family members*, *acquaintances*, or *alone* if nobody was present. To measure the perceived healthiness of the reported breakfast, the participants rated how healthy they thought it was using a 0–10 scale ranging from *not at all healthy* to *very healthy*.

Belief about why breakfast was (un)healthy. The participants reported in an open-ended response format why they thought the breakfasts they reported on were healthy or unhealthy. The categorisation process consisted of matching descriptions on the basis of similarity between words or phrases regarded as conveying the equivalent meaning. The most representative or repeated term was used as a category name. This procedure has been applied in related research (Laguna-Camacho & Booth, 2015) and is consistent with the principles of the thematic analysis (Braun & Clarke, 2006). Descriptions were allocated to a category by consensus between a nutritionist from the research team and an external nutritionist. The matches in categorisation between both nutritionists were above 95% and the remaining discrepancies were consulted on with the third nutritionist from the research team until a consensus was reached. The mentions of every category in each condition were counted and converted into percentages.

Breakfast healthiness rated by nutritionists. The nutritionist of the research team and the external nutritionist individually evaluated the healthiness of the reported breakfasts against a standard breakfast with adequate food portions, energy content, and macronutrient distribution tailored to participants' age, height, and weight (Laguna-Camacho, 2009; Raynor & Champagne, 2016). The standard breakfast was given the perfect score of 10, which was reduced if any criterion was not met (Supplemental Table 1). The agreement on scores among nutritionists was high ($\kappa = .77$, $p < .001$). Discrepancies between the two nutritionists were solved with the third nutritionist of the research team to obtain a consensus for the ratings of breakfast healthiness, which were then compared with the ratings of breakfast healthiness made by the participants themselves.

Data analysis

Differences in values of each variable examined between conditions of healthy or unhealthy breakfasts were assessed by analyses of variance for mean values and by the exact probability test for proportions. Correlations between variables were analysed as well. Differences between two correlation coefficients (r) were tested by the conversion of r to z scores. A probability of .05 or less was considered statistically significant based on the correction applied.

Participants had similar demographic characteristics in both weight ranges (overweight and obese) and in both neighbourhoods (urban and semi-urban), except for higher education levels in the urban neighbourhoods as compared to the semi-urban ones (Supplemental Table 2). There was, however, no evidence for differences between the two weight ranges or both types of neighbourhoods with regard to the characteristics of the reported breakfasts, beliefs of (un)healthy breakfasts, and mismatch between study participants' and nutritionists' evaluation of breakfast healthiness (Supplemental Tables 3–5). Hence, to test differences between healthy and unhealthy breakfast conditions, the data of all participants were combined.

Results

Characteristics of reported breakfasts

The time between the reported breakfast episode and the questionnaire completion was on average less than 3 days, and this did not differ between healthy and unhealthy breakfasts (Table 1). Not surprisingly, the descriptions of breakfasts differed when the participants were prompted to characterise their healthy breakfast or unhealthy breakfast. More portions of fruit and vegetables were reported in the descriptions of healthy breakfasts as opposed to unhealthy ones (Table 1). In contrast, more portions of grains, sugar and fat were reported for unhealthy breakfasts. Unhealthy breakfasts were higher in total energy content and showed the higher proportion of energy from lipids than healthy breakfasts (Table 1). Also, healthy breakfasts were consumed mostly at home and unhealthy breakfasts were often consumed away from home (Table 1). The mean number of companions was three people – most commonly family members; no difference with respect to this was observed between healthy and unhealthy breakfasts.

Table 1. Characteristics of reported healthy (HB) and unhealthy (UB) breakfasts.

	HB (n = 60)	UB (n = 60)	Effect size	*t*	*p*
Episode recency, days back	2.7 ± 2.3	2.8 ± 2.0	.052	0.28	.78
Place of the episode, %					
Home	90.0	48.3	.740	3.93	.001
Out of home	10.0	51.7			
Number of people present	2.6 ± 1.7	2.7 ± 2.5	.058	0.30	.77
Relationship, %			.101	0.55	.58
Alone	20.0	23.3			
Family	70.0	65.0			
Acquaintances	10.0	11.7			
Food portions reported					
Fruit	1.6 ± 1.5	0.3 ± 1.1	1.058	-5.56	.001
Vegetables	0.4 ± 0.6	0.1 ± 0.2	.805	-3.49	.001
Grains	1.7 ± 1.8	4.2 ± 2.8	1.152	5.81	.001
Higher protein foods	1.1 ± 1.1	1.3 ± 1.5	.144	0.75	.45
Dairy	0.5 ± 0.7	0.2 ± 0.5	.514	-2.63	.01
Water	0.4 ± 0.6	0.4 ± 0.5	.098	-0.53	.60
Sugar	0.6 ± 0.7	2.2 ± 2.3	1.217	5.13	.001
Fat	0.4 ± 0.7	2.7 ± 2.8	1.583	6.42	.001
Nutritional content					
Kilocalories	372.9 ± 198.3	607.9 ± 341.0	.948	4.61	.001
Carbohydrate %	70.7 ± 19.7	64.0 ± 15.1	.395	-2.08	.04
Protein %	16.2 ± 10.6	12.8 ± 7.0	.412	-2.08	.04
Lipids %	13.1 ± 10.4	23.2 ± 11.7	.923	4.98	.001

Notes: Continuous variables: mean ± standard deviation. Categorical variables: percent (%) of total participants in the condition. Effect size: Cohen's *d*. *t*: independent samples *t*-test. *p*: probability value – *p* value for reliable differences adjusted for 16 comparisons from 0.05 to 0.003.

Concordance of (un)healthy breakfast beliefs with dietary guidelines (Hypothesis 1)

Participants briefly described their beliefs about why their reported breakfast was healthy (HB) or unhealthy (UB). Their beliefs about healthiness of breakfast involved a given type of food (HB: "because it has fruit" or UB: "because it lacks fruit"), an attribute of the food (HB: "it has vitamins and proteins" or UB: "it does not include the necessary nutrients"), or a reference to intake balance (HB: "it is balanced" or UB: "because it has a lot of fat"). In some cases, participants' responses included more than one reason for the breakfast being healthy or unhealthy (HB: "because of the vegetables and the fruit, it is balanced" or UB: "it has a lot of fat, also it is not nutritious and has no vitamins"). Each reason was separately ascribed to its respective belief category. To identify salient beliefs about why the breakfast was *healthy* or *unhealthy*, if the same notion was mentioned either as a factor present (HB: "it had fruit") or not present (UB: "it had no fruit") in the breakfast, it was considered as the same belief and the total number of mentions were analysed in order to detect any differences in the proportion of participants who mentioned it and participants who did not mention it.

Overall, these belief categories agreed with the evaluation of healthiness indicated in the dietary guidelines (Table 2). Considering reliable data only, participants believed that the reported breakfast was healthy if it contained fruit, vegetables, grains and that the reported breakfast was unhealthy if it contained sugar, fat, and refined grains. The most frequently mentioned category of reasons for the breakfast being healthy was "it had fruit", while the most frequently mentioned category of reasons for the breakfast being unhealthy was "it had fat."

Table 2. Counts of reported beliefs about why breakfasts were healthy (HB) or unhealthy (UB) (%).

Categories	HB (n = 60)	UB (n = 60)	Effect size	*p*
It had fruit	48.3	0.0	.400	.001
It had no fruit	0.0	11.7		
It had vegetables	20.0	0.0	.260	.008
It had no vegetables	0.0	3.3		
It had grains	20.0	0.0	.227	.025
It had no grains	0.0	5.0		
It had protein	16.7	0.0	.260	.008
It had no protein	0.0	1.7		
It had dairy	16.7	0.0	.188	.075
It had no dairy	0.0	5.0		
It had water	1.7	0.0	.092	1.00
It had no water	0.0	0.0		
It had no sugar	0.0	0.0	.349	.001
It had sugar	0.0	21.7		
It had no fat	11.7	0.0	.324	.001
It had fat	0.0	40.0		
It had no refined grains	0.0	0.0	.302	.001
It had refined grains	0.0	16.7		
It was natural	18.3	0.0	.119	.191
It was not natural	0.0	10.0		
It had nutrients	11.7	0.0	.172	.097
It had no nutrients	0.0	25.0		
It was balanced	28.3	0.0	.140	.180
It is unbalanced	0.0	41.7		

Notes: % = percent of total participants in the condition. *p*: exact probability value – *p* value for reliable differences adjusted for 16 comparisons from 0.05 to 0.004.

Concordance of breakfast healthiness ratings between participants and nutritionists (Hypothesis 2)

As predicted, participants rated healthy breakfasts as more healthy and unhealthy breakfasts as less healthy than nutritionists (Table 3). Correlation coefficients did not differ between the types of breakfasts. Overall, participants' perceived breakfast healthiness was moderately positively correlated with breakfast healthiness as rated by nutritionists (Figure 1). Also, participants' perceived breakfast healthiness was negatively correlated with the estimated energy content (Figure 2).

Table 3. Associations between participants and nutritionists in rated healthiness of reported breakfasts.

	Breakfast healthiness								*r* HB vs. *r* UB	
	k	**Nutritionists** *M ± SD*	n	**Participants** *M ± SD*	*t*	*p*	*r*	*p*	*z*	*p*
Healthy breakfasts	60	6.2 ± 0.9	60	8.1 ± 1.5	-8.06	.0001	-0.02	.87	-1.07	.28
Unhealthy breakfasts	60	4.5 ± 1.3	60	3.1 ± 2.5	2.24	.0001	0.14	.29		
Healthy and unhealthy breakfasts	120	5.4 ± 1.4	120	5.6 ± 3.2	-0.79	.43	0.52	.0001		

Notes: k = number of breakfasts evaluated by nutritionists. *M ± SD* = mean ± standard deviation. HB = Healthy breakfasts. UB = Unhealthy breakfasts. *t* = *t* test. *r* = correlation coefficient. *p* = probability.

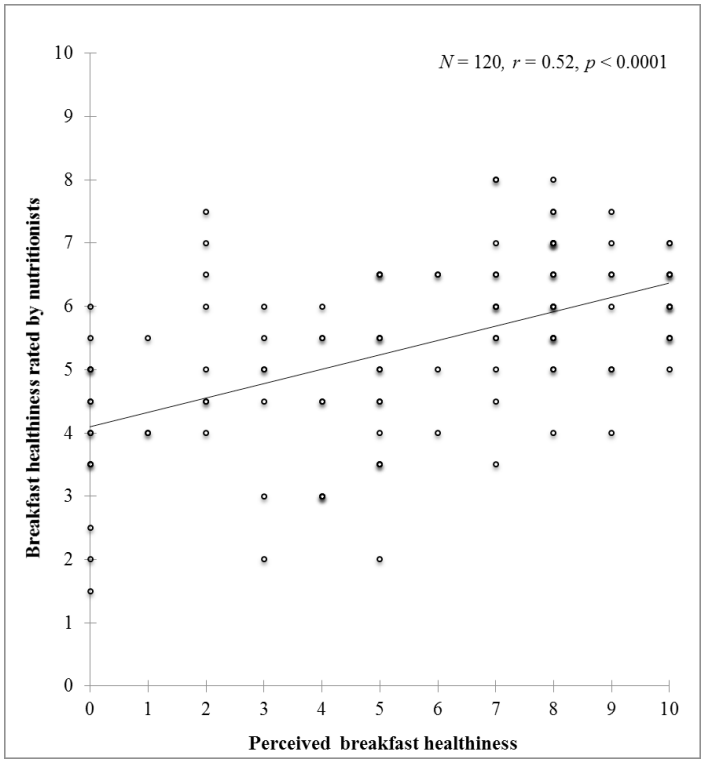

Figure 1. Association between breakfast healthiness rated by participants and breakfast healthiness evaluated by nutritionists.

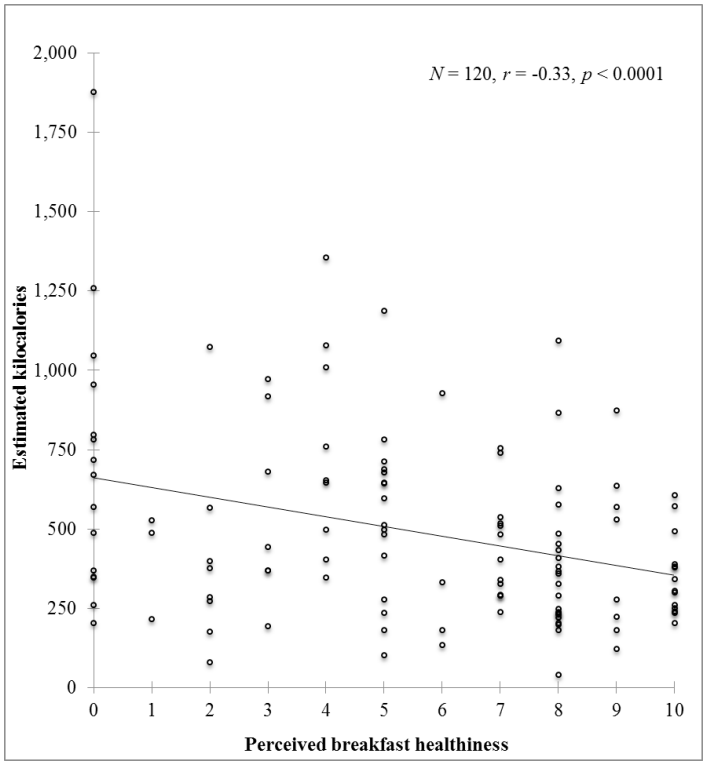

Figure 2. Association between perceived breakfast healthiness and estimated energy content of breakfast.

Discussion

In line with our first hypothesis, which suggested that many beliefs of overweight and obese women may relate to widely disseminated notions of healthy and unhealthy foods, the main finding of the present study was the match between beliefs reporting that breakfasts were healthy or unhealthy because they included certain food items (like fruit) or nutrients (like sugar, fat) classified respectively as healthy or unhealthy by the dietary guidelines and experts. In concordance with the previous studies (Cloutier *et al.*, 2013; Laguna-Camacho & Booth, 2015; Larkin & Martin, 2016), it showed that people in general make correct distinctions between healthy and unhealthy food items. This contrasts with the claim that the members of the public have misconceptions about healthy and unhealthy eating (Brown *et al.*, 2011; Mozzaffarian & Ludwif, 2010), which refers more to the difficulties people have with understanding dietary guidelines related to the quantities of food, calories or nutrients.

In consistency with our second hypothesis, which tested the degree to which the participants' perceived healthiness of breakfast corresponded with the standards set by nutritionists, the perceived healthiness of breakfasts matched moderately with the nutritionists' evaluations. Our findings are in line with the previous research in which people have been found to overrate healthy foods and underrate unhealthy foods (Carels *et al.*, 2006; 2007; Larkin & Martin, 2016); compared to the nutritional evaluation of breakfasts, participants overrated the healthiness of healthy breakfasts and underrated the healthiness of unhealthy breakfasts. It would indicate that people's evaluations about the level of perceived healthiness of their meals may be prone to certain errors. Nevertheless, the perception of healthiness of eating episodes seemed to be dominated by accurate evaluations.

Judging from the reported beliefs of participants (Hypothesis 1) and nutritional evaluations of breakfasts (Hypothesis 2), we propose that the exaggerated perception of breakfast healthiness or unhealthiness resulted from the presence of food items that are saliently considered to be healthy or unhealthy. For example, a possible reason for overrating breakfast healthiness would be the inclusion of fruit and for underrating breakfast unhealthiness would be the inclusion of fat.

The fact that some food types were perceived as healthy or unhealthy more often than others possibly involves more exposure to information about healthiness of foods that reinforces those concepts. Examples of this are widely promoted public health education campaigns such as "eat fruit and vegetables" (Rekhy & McConchie, 2014). In the present study, vegetables did not play such a large role in the perceived healthiness of breakfasts as fruits. This may relate to common breakfast ingredients including fewer vegetables than other meals such as lunch and dinner. However, including vegetables in lunch or dinner may contribute to increasing the perceived healthiness of these meals. The inclusion of fat contributed to the underrating of breakfast healthiness. Popular claims that "fat is fattening" or that there is "a war against fat" (Walker & Parkel, 2014) could play a role in perceiving it as a primary aspect of unhealthy eating.

More studies are needed to examine the possibility that people skew their ratings of healthiness of eating episodes towards particular food items considered healthy or unhealthy overlooking other not that salient healthy or unhealthy foods consumed during the same meals. Significant improvements are also needed in the definition and evaluation of healthy and unhealthy eating in research and professional practice (Magni, Bier, Pecorelli *et al.*, 2017), in which more precise methods for estimating energy and nutrient intake are also necessary. Moreover, little is known specifically about how recent episodic memories could be shaped by factors such as weight loss motivation, stress, depression, etc. (Marchetti, Koster, Klinger *et al.*, 2016), and this would remain to be elucidated.

Strengths of the present study were the generalizability of the findings based on the use of probabilistic sampling involving the female members of the public, reports based on the reliable memories of recent breakfast episodes (Conway, 2009; Knibb & Booth, 2011; Laguna-Camacho & Booth, 2015), taking into consideration combinations of foods (i.e. a meal) rather than single food items as well as the objective evaluation of food intake. Future studies following the present approach may benefit from including a control group of women within a healthy weight range, matched on demographic characteristics. Alternatively, an internal control condition could be included where women with overweight or obesity would report not only their own breakfast episodes but also a close other's or a hypothetical person's breakfast episode.

In conclusion, the beliefs of women with overweight or obesity about food items constituting a healthy or an unhealthy breakfast were consistent with the food categories of dietary guidelines. However, the level of the perceived healthiness and unhealthiness of breakfasts were slightly exaggerated as compared to nutritionists' evaluations of these breakfasts. Future research examining both perceptions and evaluations of breakfast (un)healthiness is warranted.

Ethics statement: This study was carried out in accordance with the ethical principles recommended by CONBIOÉTICA, México. The protocol was approved by the Medical Sciences Research Centre, Autonomous University of the State of Mexico (No. 2015/12). All subjects gave written informed consent in accordance with the Declaration of Helsinki.

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