

The photo-elicitation of food worlds: A study on the eating behaviors of low socioeconomic Chilean women



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ABSTRACT

Traditional methods for studying eating behaviors include quantitative methods such as 24-h dietary recalls or food frequency questionnaires. Recently, visual methods such as photo-elicitation (PE) have been recognized as useful for studying and understanding eating behaviors. PE has been defined as the use of images during an interview. The goals of this study are to demonstrate the potential of PE for exploring the eating behaviors of Chilean women of low socioeconomic status and to show the advantages and disadvantages of PE from the participants' points of view. The study included 31 participants who were asked to take pictures that represented what they considered important to them in their "food world". The pictures were developed and participants were invited to participate in an individual interview. Participants were able to talk about their eating behaviors and those of their families, the factors influencing those behaviors, their dietary knowledge and skills, and their reflections on their diet using the photographs. PE proved to be a feasible research technique for the studied population, and was well received and enjoyed by the participants. The participants perceived a few barriers with PE, such as forgetting to take pictures or not having ideas for new pictures. Nevertheless, PE allowed researchers to obtain rich information about eating behaviors, and can therefore be a useful method for working with populations of underserved areas. The PE data that this study collected could be used to create or improve interventions promoting healthy eating within the studied population.

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1. Introduction

Eating behaviors—especially those constituting an unhealthy diet (i.e., increased intake of food with high amounts of fat, salt, and sugars, and low amounts of vitamins and minerals [World Health Organization (WHO), 2016])—have been noted as a "major modifiable determinant of chronic disease" (WHO & Food and Agriculture Organization, 2003, p. 2). In order to implement better health interventions, many researchers are interested in understanding why people consume unhealthy diets.

Traditionally, both quantitative and qualitative methods have been used in the study of eating behaviors. Quantitative methods, such as food frequency questionnaires or 24-h dietary recalls, allow researchers to ascertain what and how much a person is eating, but

these instruments do not lead to in-depth information that explains the complex personal and social factors that contribute to individuals' eating behaviors. Although qualitative methods, such as focus groups and interviews, have proven useful for studying questions about "the how and the why of certain behaviors" (Hargreaves, Schlundt, & Buchowski, 2002, p. 560), they are limited when it comes to understanding specific patterns of nutrient intake.

Researchers have recently begun experimenting with alternative methods of studying eating behaviors. Visual methods, especially, enable researchers to explore a diverse range of health issues (Pain, 2012). Visual methods are defined as the use of any kind of visual material in a research study, such as videos, pictures, drawings, and images. Researchers or participants can compose these visual tools, or they can consist of previously existing materials (Banks, 2001). Visual strategies have been used to complement traditional qualitative research, offering several benefits including:

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obtaining information from participants' perspectives on multiple and diverse aspects of their lives, promoting more detailed communication and/or explanation of participants' ideas and feelings, fostering greater connection and interaction between researchers and participants, among other benefits (Pain, 2012). Visual methods can also complement quantitative research approaches. For instance, in the food and nutrition field, Keller, Fleury, and Rivera (2007) argue that visual methods can yield more information about portion sizes, food purchases, and preparation patterns. In summary, researchers tend to use visual methods for two reasons: to enhance data collection and presentation, and to improve the relationship between the participant and the researcher (Pain, 2012).

Photo-elicitation (PE) is a visual method that has attracted researchers in sociology, education, and health, among other fields (Rose, 2012). When utilizing this method, members of a community take photographs relating to a particular theme, and then discuss the photographs and theme during interviews (Gubrium & Harper, 2013; Rose, 2012). PE has been described as “a photograph into the research interview,” which can lead to a better understanding of the participants' worlds (Lorenz & Kolb, 2009, p. 263). This method considers pictures as records of reality, and as sources of information that can be used to thoughtfully answer a research question (Rose, 2012). According to Rose (2012), pictures introduce several complex elements to the interview process, including the context in which they were created. Some authors argue that pictures are important not only for what they are, but also for “what it is that visual methods are able to achieve” (Knowles & Sweetman, 2004, p. 6).

The use of PE has extended to studies of eating behaviors. So far, most studies include women as participants (Johnson, Sharkey, & Dean, 2011; Johnson, Sharkey, McIntosh, & Dean, 2010; Keller et al., 2007) and focus on food choice. For example, Johnson, Sharkey, & Dean (2011) studied the food choices of Mexican mothers, which were heavily influenced by their children. The same group of researchers studied the influence of matrilineal family members on families' food choices (Johnson et al., 2010). Lachal et al. (2012) used PE to understand the role of food in obese adolescents' family life. Throughout these and other studies, pictures have been considered a reliable source of information to complement the study of eating behaviors because they provide information about these habits that cannot be obtained with traditional methods of assessing food and nutrient intake (Husby, Heitmann, & O'Doherty Jensen, 2009).

Using PE to study eating behaviors can be especially effective in interventions targeting populations of low socioeconomic status or those that are underserved, which are groups where the rates of obesity are higher (Álvarez-Castaño, Goez-Rueda, & Carreño-Aguirre, 2012). For example, in Chile—a middle upper-income country, according to WHO (2011)—30.7% of the population of those over 15 years of age suffer from obesity. When this prevalence is examined according to socioeconomic level, studies show that it is higher in lower socioeconomic groups (35.5%). This situation is worse among women from low socioeconomic groups, whose prevalence of obesity reaches 46.7% (Ministerio de Salud de Chile, 2010). This could mean that this group of the population is more likely to be engaging in unhealthy diets.

Previous studies using PE to target underserved women in the United States have achieved favorable results (see Balbale, Schwingel, Chodzko-Zajko, & Huhman, 2014; Johnson, Sharkey, & Dean, 2011; Keller et al., 2007; Sebastião, Gálvez, Bobitt, Adamson, & Schwingel, 2016), indicating that PE is a promising method for studying eating behaviors within this demographic group. It is also important to note that the social benefits of working with women extend beyond merely improving the health status of individuals; women are important in society for their productive and

reproductive roles, but also for their consumer and healthcare provider roles. Women are more frequently in charge of the food purchasing and have an important role in modulating the home food environment (Byrd-Bredbenner, Abbot, & Cussler, 2011). In many countries like Chile, women act as the primary caregivers of their children, play important roles as housewives, and exert significant influence on the behavior of other family members (Chadwick, Crawford, & Ly, 2013).

The current research intends to contribute to the nutrition and behavioral field, giving novel data about the potential of PE for researching eating behaviors beyond the study of food choice. This study intends to work toward filling this gap by pursuing the following goals: (1) to explore what kind of dietary information can be gathered using PE in a group of women of low socioeconomic status, and (2) to report on the advantages and disadvantages of PE, as perceived by the participants.

2. Materials and methods

2.1. Participants and sampling

Participants of this study included 31 native Chilean women who had at least one child younger than 12 years old, and who were living with a partner. All participants were living in low socioeconomic urban neighborhoods in Santiago, as defined by the Social Priority Index [Índice de Prioridad Social] (Secretaría Regional Ministerial de Desarrollo Social- Gobierno de Chile, 2014). This index is defined by five categories, based on variables such as income and the education level of people in each neighborhood; these variables determine the level of vulnerability, ranging from “high priority” to “no priority”. Our research was conducted in five neighborhoods; three were high priority and two were middle-high priority neighborhoods. The socio-demographic characteristics of the participants can be found in Table 1.

A purposive sampling method was used in this study. This method allowed for a wide selection of participants, which supplied the study with a sufficient variety of participant perspectives and information (Krathwohl, 2009). More than 50 women who met the inclusion criteria (aged 25–50 years old, had at least one child less than 12 years of age, and lived with a partner) were invited to participate. They were invited through face-to-face contact in waiting rooms at public health care centers or community

Table 1
Socio-demographic and health characteristics of participants (n = 31).

Characteristic	Value
Age in years (mean ± SD)	36.2 ± 6.3
Educational attainment (%)	
Less than 12th grade	10
High School	64.5
Technical	22.6
College	3.2
Work status (%)	
Unemployed	61.3
Monthly household income (US\$ per capita) (mean ± SD)	166 ± 124.3
Kind of health insurance (%)	
Public	90.3
Presence of chronic disease (%)	
Yes	35.5
Any kind of aerobic exercise (%)	
No	74.2
Any kind of resistant exercise (%)	
No	96.8
Nutritional Status (%)	
Normal weight	29
Overweight	48.4
Obese	22.6

organizations. In addition, snowball sampling was used (Emerson, 2015). A total of 31 women completed the study.

Prior to recruitment and data collection, clearance was obtained from the Institutional Review Board at the University of Illinois at Urbana-Champaign and from the University of Chile's Ethics Committee. Informed consent was obtained from all participants prior to their initiation in the study.

2.2. Data collection

Semi-structured individual interviews using PE (Hanna, Jacobs, & Guthrie, 1995; Harper, 2002; Lachal et al., 2012) and a protocol of questions were conducted from November 2014 to March 2015. Participants came to an initial meeting in which each of them received a disposable camera with a capacity for 27 pictures. The decision of using disposable cameras was based on two reasons: to standardize the pictures and to avoid a situation where participants decided not to participate due to the lack of a camera (cellphone or other kind). Participants were trained to properly use the cameras, and instructed on the ethics of taking pictures, such as how to obtain a signed consent form for photographs of children. After this training process, women were asked to take approximately 20 pictures of their "food world", which would include anything in their lives that was both important for them and was related to food. Participants received the following instructions:

"As a part of this project, we need you to show us your food world. This means everything that is important to you that is related with food. It could be meals, social events, places in which you buy food, among other things ... everything that is important to you ... There are no good or bad pictures ... if something is important for you, we want to know. We ask you to take about 20 pictures of your food world"

Participants were able to use the remaining pictures to capture images of personal interest (Johnson et al., 2010). They were asked to take pictures over seven consecutive days. Participants received one phone call during the period in which they were taking photographs to see their degree of assignment completion. After this period, participants returned the camera, and two copies of the pictures were obtained, one copy for the participants and another to use during the interviews.

At the beginning of the interviews, participants were asked to share their experiences and overall opinion of their PE assignment (Johnson, Sharkey, Dean, McIntosh, & Kubena, 2011). For this, participants were asked to freely respond to the questions: "What did you think about taking pictures for this project?" "What did you like the most about it? Why?" "What did you dislike? Why?" Next, they were asked to review their pictures and select five to seven of them that they most wanted to share or that they thought were particularly interesting. Participants were asked to title the selected photos (Johnson, Sharkey, & Dean, 2011), and then, the interviewer followed the Shaffer's (1983) SHOWeD technique—which has been used in other PE studies on eating behaviors (Johnson, Sharkey, & Dean, 2011; Johnson et al., 2010). This technique poses questions such as, "What do you See in this picture?"; "What is Happening in this picture?"; "How does this relate to Our life?"; "Why does this problem, concern, or strength exist?" and, "What can we Do about it?" The researchers also selected 5 to 7 additional pictures from those that the participants did not select, and followed the same SHOWeD procedure for these photos. The SHOWeD technique was used because it has the ability to start a discussion about the images that may go beyond what is objectively perceived (Johnson, Sharkey, & Dean, 2011; Shaffer, 1983). After these questions, participants were allowed to talk freely about each selected picture,

and the interviewer asked questions to clarify or expand on the answers that were given.

A Chilean researcher conducted all interviews in Spanish. Participants selected the time and place of the interviews. Most of the interviews were performed at participants' homes and lasted between 30 and 90 min. Four participants did not agree to be audio recorded; as such, the researcher took notes during the interview. To obtain better field notes from these participants, after each picture was discussed, the researcher reviewed the notes with them and asked them if they wanted to change or add anything.

2.3. Data analysis

All interviews were transcribed verbatim and checked for accuracy. The field notes from participants' interviews that were not audiotaped were placed into a Word document and were treated as verbatim-transcribed interviews. Five researchers then drew on Braun and Clarke's (2006) guidelines to conduct a thematic analysis, employing an inductive analytic approach to assess the narratives participants constructed about their pictures (Johnson, Sharkey, & Dean, 2011). The researchers performed a preliminary analysis of ten interviews to familiarize themselves with the data and search for initial codes. They looked for all the information that could indicate what the participants' food world were. The first cycle of coding was conducted without any previous argument, theory or framework. Each code represented a certain idea that a participant mentioned during the interview (Saldaña, 2013). Subsequently, the team compared codes for agreement, retaining only those codes that the majority of investigators identified and that the entire team unanimously agreed upon after extensive discussion. The leading researcher then created a general codebook containing these initial codes. The researchers used this general codebook in conjunction with Nvivo 10.0 to code and organize the data from the 31 interviews. Once all the interviews were coded, the researchers reviewed these codes, categorized them (using the goals of the study for framing this categorization), and obtained themes from the observed patterns (Saldaña, 2013). The final themes represent the perspectives of the majority of participants. When discrepancies arose, the team discussed each issue and used these discussions as an opportunity to further refine each theme (Patton, 2002). The four main themes that resulted from this process answer the goals that were set at the beginning of this manuscript and are displayed in the following section. Sample interview quotations and photographs provide examples for each theme. Because few direct quotations were registered from the participants that did not want to be taped, all quotations used as examples came from the other 27 interviews. Codes for each participant were used to identify the quotation origins. These codes correspond to a letter and a number.

3. Results

Participants took between 10 and 27 pictures, amounting to a total of more than 500 pictures among all the participants. Forty-eight percent of the pictures taken were used during the interviews (pictures selected by the participants or the researcher). The pictures captured meals, the food preparation process, social events with family or friends, children and spouses, and various food vendor sites, such as restaurants, farmer's markets, and grocery stores.

Using the participants' perspectives that were voiced during the interviews about their food world described through the pictures, we organized the results section into four main themes. These themes represent participants' observations during and after the PE assignment: (1) Empowers when talking about eating habits, (2)

Encourages reflection on eating habits, (3) Is familiar, includes the family, and gives freedom, and (4) Needs follow-ups and reminders. The first and second themes correspond with our goal of exploring the kind of data that can be gathered using these methods, and the other two are linked with our goal of listening to the participants' voices about the advantages and disadvantages of PE. Table 2 displays a summary of the results.

3.1. Theme 1. Empowers when talking about eating habits

Participants were able to talk about their diets and their family members' diet. They used the pictures for supporting their arguments about their eating behaviors. Through the pictures, participants were able to document four main aspects of their eating patterns. They were able to talk about their own dietary patterns. They talked about their dietary decisions, explaining how their diet was. They were able to talk about their choice of what food to eat, with whom to eat, where and when to eat, and what food stores to shop at. They were able to show the kind of food that they ate or drank and the amount that they had.

"This (Image 1) is my breakfast when I am relaxed" (B54)



Image 1, Not Titled

"I arrive here [the place where she works] and I have it [breakfast, Image 2] here ... this is my weekday breakfast, at 9 am ... this is my milk carton that is skim milk ... this is my milk and my bread bun with ham ..." (C27)



Image 2, titled "El Desayuno Ideal" (The Ideal Breakfast).

In addition, participants were able to talk about their families' eating behaviors. They demonstrated comprehensive knowledge of

what their husband or partner and children chose or preferred to eat. Participants knew what food their family members liked, where they ate, and at what time they ate. In fact, this knowledge sometimes surpassed their insight into their own eating habits; when asked about their own diet, they usually preferred to talk about their family members' eating behaviors. This knowledge could be observed in the following quotes:

"I prepared 'porotos con pircó' [a traditional Chilean thick stew of whole beans, corn, and fresh basil], and for them I had to prepare this [Image 3] ... because she [one of her daughters] does not eat beans, one of them [another daughter] does not eat corn ... the other one does not eat green beans, and the last one does not eat anything ..." (MI 32)

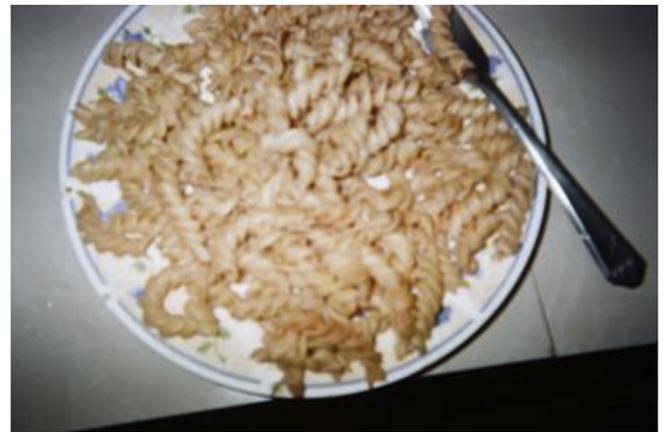


Image 3, Not Titled

"... because my husband also does not eat salad, he is rather 'special', he does not eat cheese, salad, lemon ... with me he changed a little bit, he did not eat legumes ... now he does ..." (N51)

Also, participants were able to talk about the factors they perceived as influencing their eating behaviors. Participants mentioned family members (husband/partner, and children) as the most influential factor in their food choices. For example, one participant stated:

"Here, my husband is the one that feels tempted, so sometimes he brings something and I tell him, 'No! Why did you bring this?' ... [but] he tells me, 'It is just a little bit, what is it going to do to you?' He tells me this, but that little bit is never a little bit ..." (T20)

Participants also comment on other factors including their own preferences for food taste, texture, cooking methods, and the like. Words such as "I like" or "I love" were frequently used by participants, as observed in the following quote:

"I love vegetables ... stews and tortillas [a Chilean type of vegetable omelet] ... I like everything that has vegetables ..." (S12)

Participants reported that seasonal factors—temperature and food availability—affected the way they ate; they ate differently between summer and winter, but they also mentioned that they ate differently during the week than they did on the weekends.

Table 2
Summary of the results.

Study goal	Theme	Aspects inside the theme
(1) to explore what kind of dietary information can be gathered using PE in a group of women of low socioeconomic status	(1) Empowers when talking about eating habits	<ul style="list-style-type: none"> • Ability to talk about their own dietary patterns • Ability to talk about their families' eating behaviors • Ability to talk about the factors they perceived as influencing their eating behaviors • Ability to show their level of knowledge
(2) to report on the advantages and disadvantages of PE, as perceived by the participants.	(2) Encourages reflection on eating habits	<ul style="list-style-type: none"> • Reflection on the kind, variety, and amount of food participants were eating
	(3) Is familiar, includes the family, and gives freedom	<ul style="list-style-type: none"> • Familiarity with the activity • Involvement of the whole family • Opportunity they had to take pictures of whatever they wanted
	(4) Needs follow-ups and reminders	<ul style="list-style-type: none"> • Forgetfulness • Run out of ideas about what else to photograph

"In the summer you can get more fruit (Image 4) ... by the very fact that it is hotter, you are thirstier ... then, you make juice [from fruits], and to avoid spending money on ready-made juice, I bought melons ... It is cheaper to make melon juice in the summer ..." (C13)



Image 4 titled "Compra de Vegetales (Buying Vegetables)"

Financial constraints such as economic needs, budget, and food prices were also acknowledged as factors that influenced the type of food participants bought and ate. As one participant explained:

"I think that in relation to how the variety of food has changed today ... sometimes the budget does not allow you to buy the best [food] ... for example, you try not to select the most expensive rice, or the cheapest one, but one that is in the middle ... you do not have the opportunity to try whole grain rice for example ..." (N35)

Finally, participants were able to show their level of knowledge, their skills, and their sources of knowledge. When participants explained the pictures, most of them demonstrated that they had some degree of knowledge about nutrition and food. They also highlighted some of their food-related skills, especially cooking skills. Some of them were even able to talk about specific nutrients in the foods, and how these nutrients were related to a particular health condition. For example, as participants stated:

"Yes ... proteins are in meat, carbs are in rice, pasta, or potatoes, and fiber is in cereals and vegetables ..." (MC26)

"... Toast with margarine (Image 5) ... I think butter has a lot of fat and we have never eaten butter ... because it is [related] weight gain and diseases such as diabetes, cholesterol ..." (J15)



Image 5, titled "Desayuno (Breakfast)"

Some participants noticed that even though they knew what and how they should eat, they still sometimes chose to eat in a different way. In addition, participants acknowledged the sources of their culinary knowledge and skill sets, such as television, the internet, and other family members (especially their mothers or grandmothers).

3.2. Theme 2. Encourages reflection on eating habits

According to participants, PE allowed them not only to recognize how they were choosing to eat, but also encouraged them to reflect on how they were eating. Visualizing the amount and kind of food they usually ate seemed to inspire them to evaluate their eating habits. This is illustrated by participants saying:

"It is weird, one never takes pictures of food ... but it made me pay more attention to what I am eating ..." (V30)

"Because I realized that I ate too much ... one sits down to eat, but does not take the time to see what one is eating ..." (Y53)

Using the pictures, participants were able to better perceive how they were eating; they became aware of the lack of variety in their food intake and the amount of food that they were eating. They also mentioned that these facts passed unobserved among them, and that through the pictures they could become aware of them.

3.3. Theme 3. Is familiar, includes the family and gives freedom

Participants mentioned three positive aspects about the PE assignment that allowed them to enjoy performing the activity. The

first aspect is related to familiarity with the activity. All the participants agreed that the PE assignment was easy for them, mainly due to the fact that most of them were used to taking pictures on a daily basis. Even when participants received a disposable camera, while being more used to taking pictures with their cellphones, they felt comfortable performing the assignment. For instance, two participants said:

“I am used to taking pictures ... I took so many pictures ... so, no it was not uncomfortable for me to do it it was not uncomfortable to take pictures of meals ...” (J19)

“I love to take pictures, in fact ... I am in charge of taking pictures here at home ... and now, my daughter too, with her cellphone ...” (T20)

A second aspect was related to the involvement of the family in the PE assignment. Some participants explained how the PE assignment became a family matter; family members were helpers with the assignment and they spontaneously involved themselves in the picture taking process, so that it became an activity the whole family enjoyed together.

“It was fun [the PE assignment] ... my daughter helped me a lot ... when we were seated at the table, she told me, ‘Mom, the picture!’” (B54)

“The whole family participated [on the PE assignment]. I mean everyone was keen on telling me to take the picture ... they reminded me” (B52)

“I found it a lot of fun because we were all involved [referring to the family] ... ‘Hey ... remember that you have to take the picture’ ... we were all involved” (V22)

The third positive aspect for participants was the opportunity they had to take pictures of whatever they wanted to show or what was central to their food world. Participants were asked to indicate why they took the pictures they did. Most of them answered that, through the pictures, they wanted to represent the many parts of their lives in which food is involved. They mentioned that this freedom in taking pictures was something enjoyable.

“As I had to take pictures about my food, I took pictures to show everything that I eat in the morning” (C27)

“I took it [the picture, Image 6] so that you can see everything I keep [at home] ... so you could see what I cannot run out of” (J17)



Image 6, Not Titled.

Among the pictures that they selected to show were: family members eating food; food or meals that they ate or cooked; items they could not eat frequently; and items they particularly enjoyed eating.

3.4. Theme 4. Needs follow-ups and reminders

Through the participants' narratives, it was possible to gather information about two main problems they encountered when adding the PE assignment to their daily routine. First, participants said that sometimes they forgot to perform the assignment, or they only remembered to do it after they had already performed the activity that they wanted to photograph.

“It was easy [the PE assignment] ... sometimes I forgot it ... we had lunch and I said, ‘I did not take the picture’ ...” (MI 32)

“I forgot it [PE assignment], we were eating and I finished my meal and I remembered the picture ... in one of the pictures there is an empty plate.” (MC 26).

Second, participants mentioned that, after they had been working on the assignment for a while, they did not know what else they could photograph, as they expressed that their food-related activities were very similar each day. Therefore, participants took pictures involving previously captured content, such as meals, in different ways.

“I think that it was relatively easy [to do the photo-elicitation assignment] ... sometimes I did not know what else I could take pictures of.” (N35)

“In one moment it was difficult [PE assignment], because I did not want to take pictures, since it was everything related to what influences my diet ... so, it was complicated ...” (C13)

These two difficulties led to some of the participants taking more time to complete the assignment.

4. Discussion

The current article intends to show what kind of information can be gathered using PE in relation to the diets of women from low socioeconomic backgrounds, in addition to the participants' opinions of being involved in the research. We discovered that PE is a useful method of data collection that has the potential to elicit valuable information from participants about their dietary intake habits, which other methods may neglect. According to our analysis of participants' pictures and interview narratives, PE yields information that leads to a better understanding of participants' eating behaviors, from their individual food choices to familial and cultural influences. In addition, PE presented advantages when working with this group of women from low socioeconomic areas, since it is easy to implement and its central task is familiar to participants. The information provided in this study can be helpful for researchers when deciding whether or not to utilize the PE method in future research.

Participants in this study documented specific, concrete details about their eating behaviors such as what kind of food they chose to eat or not eat, what time they decided to have their meals, the social interactions they engaged in during meals, and the places they chose to eat, among other pieces of information. This finding builds on previous applications of PE in eating behavior interventions that do not take such a fine-grained approach to obtaining information about eating practices. For example, in their

PE study of food-related identities among mothers, [Johnson, Sharkey, Dean, et al. \(2011\)](#) focused on how participants abstracted food identities from their eating routines—e.g., as one participant indicated, “I’m not much of a creative eater” (p. 223)—and not on discrete behaviors themselves. In our study, however, participants explicitly documented and talked about specific eating habits and decisions. This evidence supports the point elucidated by other authors ([Keller et al., 2007](#)) regarding the ability of PE to complement traditional methods, as participants explicitly documented and talked about specific eating habits and decisions.

Participants from our study demonstrated extensive knowledge of their husband’s/partner’s and children’s eating patterns. They most likely acquired this knowledge from their own daily lives: all participants, despite some of them working outside of home, were in charge of the family meal preparation. This role and experience allowed them to understand how their family ate, giving them an awareness of their family’s tastes and preferences. To our knowledge, no other study, using PE, has addressed the high level of knowledge women have about their family members’ diets. In [Johnson, Sharkey, Dean, et al.’s \(2011\)](#) study, women took pictures of their children’s food, but did not provide any information about their partner or husband in their pictures or discourse. This high level of knowledge displayed by participants is important for three reasons. First, the knowledge about family preferences can be a challenge for health care providers when trying to promote healthy diets among women. This is because it can be especially difficult for women to change their own eating behaviors if they know that they are not going to receive the support of their families. Second, knowing the great influence that families have over women’s choices, to be effective in changing eating behaviors, interventions targeting women should also involve the family as a whole. Finally, this high knowledge level further supports the important role of women in the formation of family members’ eating habits; women are an important entry point when working with the diets of other family members. For this reason, several studies have focused on women when promoting family dietary modifications and healthy nutritional status ([Doaei, 2015](#); [Harvey-Berino & Rourke, 2003](#); [Maree et al., 2014](#); [Power et al., 2015](#)).

Perhaps most significantly, the visualization of eating habits encouraged participants to reflect upon *why* they were eating the way they did. Participants attributed their diets to their family (husband/partner and children), the seasons and days of the week, personal preferences, and financial constraints. Most PE-based studies have acquired data on the factors that influence eating behaviors or food choice, which, to this point, seems to be the most reliable benefit of using PE ([Bibeau et al., 2012](#); [Burns, Cook, & Mavoia, 2013](#); [Cuy Castellanos et al., 2013](#); [Johnson, Sharkey, Dean, et al., 2011](#); [Johnson, Sharkey, & Dean, 2011](#); [Keller et al., 2007](#)). However, the complexity involved and the multiplicity of interrelated factors influencing eating behaviors may hinder capturing all factors involved in women’s eating behaviors. Among the comments about some difficulties of using PE, a woman felt that taking pictures of her “food world” was a difficult task because of the many factors influencing her diet, which is reflected in her comment, “... it was everything related to what influences my diet ...” It is possible that PE captured those factors that were more important or closer to the participants, as well as those that were more visible to them. Researchers could use more specific directions during the PE assignment to further explore these possibilities.

Participants could understand and reflect upon their decision patterns of food consumption, such as the size of their meals or what was influencing their diet. This reflection is an opportunity to increase women’s awareness of changing dietary behaviors or preferences and thus improving the quality of their diet. Participants expressed that the opportunity to reflect on their eating

behaviors was a helpful activity. In [Keller et al. \(2007\)](#) study, participants also expressed that taking pictures allowed them to acquire knowledge about their eating habits and reflect on them—both for their own benefit and for the benefit of their families. They considered this reflection to be a particularly positive aspect of PE. [Lorenz and Kolb \(2009\)](#) suggest that visual methods can help participants reflect upon and defend their points of view regarding health and illness. The process of taking pictures also proved to be a means “of reflecting on their weight loss effort” in [Woolford et al.’s study \(2012\)](#). Therefore, PE is not only useful for gathering information about how participants eat, but it also allows participants to increase their self-awareness regarding their eating habits ([Fritz & Lysack, 2014](#)).

By increasing their self-awareness of their eating habits, participants often found reasons for commenting on their healthy eating behavior by regularly demonstrating their knowledge of food and nutrition, and commenting upon their cooking skills. Most of the participants highlighted their experience with nutritional dieting or their cooking expertise; some of them even pointed out inaccuracies or myths about food or unhealthy cooking methods. However, they were not about being self-critical, and also noticed discrepancies between what they ate and what they knew they *should* eat. Taking into consideration such instances of participants demonstrating their knowledge and self-criticism about their food choices could help guide healthcare providers’ approaches to reinforcing accurate dietary knowledge and healthy food preparation practices. To our knowledge, no other study has elicited this kind of information utilizing the PE method.

Participants had an easy time accepting and performing the PE assignment for three main reasons: they were used to taking pictures in their daily life; participants and their families enjoyed the PE assignment together; and the method allowed participants to prioritize their own subjective experiences. Participants were eager to let the researchers know what was happening in their lives, which placed them in an active protagonist role in the research narrative of the study. [Keller et al. \(2007\)](#) came to similar conclusions, finding that a group of women was very open to the idea of using pictures to register their eating behaviors.

Participants did, however, mention some minor difficulties when incorporating PE into their daily routine. Some participants indicated that they sometimes forgot to take pictures or they remembered to take the picture after they had already eaten or finished some other food related activity they meant to photograph. [Keller et al. \(2007\)](#) also found that some of their participants forgot to do the activity, missing out on opportunities to take the pictures they wanted to take. Another difficulty participants encountered was that, after a few days of picture taking, they ran out of ideas for things they could photograph. These lapses could be attributed to the fact that most of the participating women had several responsibilities in their lives, such as taking care of their children, going to the grocery store, doing housework, and other daily activities. At the same time, participants had very routine lives, spending a great part of their days at home and cooking the same foods in similar ways. Perhaps they did not have adequate time to properly think about or perform the PE assignment duties in addition to their normal routines. To help prevent these problems, periodic phone calls can be made to participants during the time period assigned for taking photographs. The calls would allow the researchers to remind participants to perform their assigned activities, and to provide suggestions of what they could photograph in order to meet their quota of photos. In addition, we suggest that researchers using PE allow the participants extra time to complete the PE assignment, even when participants are asked to complete it in less time in the field.

In the current study, participants were empowered to recognize

their individual eating behaviors. Photographs enabled participants to visualize their food world and express their reactions to it. Empowering participants to visualize and assess their own behaviors has been described as a particularly beneficial element of PE (Bugos et al., 2014). According to Richard and Lahman (2014), “Photo-elicitation interviewing methods also created an inherent dimension of empowerment through choice and justification” (p. 15). PE allows participants to observe, clarify, and expound upon the decisions behind their photo selections and the decisions behind the dietary habits represented therein (Richard & Lahman, 2014). By engaging in the PE assignment and interview, participants recognize themselves as active agents and experts in their own personal food worlds (Pain, 2012). Other methodologies using images as a base, such as photo-voice that mixes pictures and group work, have found similar advantages (Lal, Jarus, & Suto, 2012). For example, Neill, Leipert, Garcia, and Kloseck (2011) indicated that photo-voice empowered participants to engage in discussion with facilitators and to address barriers to food access and preparation, “using their own language and understandings” (p. 243). Similarly, Valera, Gallin, Schuk, and Davis (2009) recognized that by using photo-voice, participants were able to talk about and register their own stories. It seems that photographs are the key factor to facilitate the process of giving voices to participants, empowering them, and encouraging them to confidently convey their ideas. Therefore, the decision of selecting a certain visual method should be made based on the goal of the study, as well as the study’s design, since photo-voice uses group work and PE focuses on the individual voice of each participant.

Departing from the narrow scope of other PE studies, the present article attempts to take into consideration the relevant information that could be gathered via PE, as perceived by the women. In order to achieve this goal, participants had to follow a broad guideline for how to take their pictures. They were asked to take pictures of their food world; this allowed participants to take pictures of whatever they deemed relevant. Other studies that have used PE as a method of research have more heavily restricted the guidelines for what to photograph. For example, Cherrier (2012) asked participants to take pictures of good or bad consumer goods or of consumer activities that were, according to participants, relevant to their lives. Johnson et al. (2010) asked their participants to take pictures of their “food experience, defined by day to day food choice and activities” (p. 4). In Keller et al.’s (2007) study, participants were asked to record “the ways that they obtained, prepared, and consumed food” (p. 762). These three studies provide examples of more focused PE assignments. By using broader instructions to guide participants in completing the PE assignment, the current study enabled participants to visualize and comment upon whatever they wanted, and thereby to convey the most salient features of their food world. It also allowed researchers to obtain several kinds of data. Previous researchers have pointed out the opportunities to study the people’s world or reality through pictures. By using pictures, researchers can help participants go beyond what is obvious, even from the present to the past (Harper, 2002). Harper states that pictures could move and evoke elements from the “human consciousness” (p.13). Pictures are used as a base for participants to communicate their reality to others (Clark-Ibanez, 2004).

Despite this study’s indications of the usefulness of PE, it is necessary to consider some limitations: (1) Participants were instructed to take pictures about whatever they wanted in relation to their food world. We trusted that they would photograph their food world honestly. However, it is possible that there is a bias in the photos taken, since participants may have photographed what they deemed to be more or less acceptable with regard to food. This idea seemed to be confirmed in our observation that most of the

pictures did not include unhealthy food, but many included fruits and vegetables. (2) The participant criteria that we had for this study included just women with children and partners, which would explain why family was so frequently mentioned as an important influence in their lives. (3) We only included adult women who were living in an urban area and who were familiar with camera technology; it was probably easier for this population to successfully complete the PE assignment. More studies are needed to show the utility of PE with other population groups, such as older adults, or people from rural areas that are probably not as familiar with technology.

This study provides support for PE as a method for obtaining extensive and intensive data that can be used to better understand eating behaviors from participants’ perspectives. By encouraging participants to capture and discuss information about dietary patterns and their likely influences, PE can additionally provide a better understanding of the social and cultural contexts in which eating behaviors take place. Participants reported being satisfied with the method, as it provided them an opportunity to accurately and easily describe and share their food world through pictures. Overall, PE could be a useful complement for research initiatives that employ traditional quantitative or qualitative approaches for the study of eating behaviors. Using PE in an exploratory stage of the intervention development process could be especially beneficial when designing tailored interventions focused on promoting healthy eating in women of low socioeconomic status.

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Conflict of interest

The authors declare that they do not have conflicts of interest.

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