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Feasibility of Using the Brazilian Version of the GloboDiet Software to Collect Dietary Intake Data

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Abstract: Technological advances, such as the GloboDiet software, have enabled the development of instruments to standardize dietary data collection through the 24-h dietary recall (24HR). Thus, the aim of this study was to evaluate the feasibility of using the Brazilian version of the GloboDiet software. The 24HR method guided by the GloboDiet software was applied by face-to-face (n = 2093) interviews and a second measurement by telephone (n = 1084) interviews with participants from the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). The adherence rate was calculated using data from control worksheets filled out by interviewers, whereas the Chi-square test was used to assess differences between sociodemographic groups and the participants' final adherence status. For the interview's duration, the data were presented as the median and the interquartile range—IQR (Q1–Q3 (25–75%)). Non-parametric tests were used to assess differences among individuals in terms of the total duration and stages of the interview. Adherence rates were 82.8% face-to-face and 68.4% telephone interviews. The total duration of the face-to-face and telephone interviews was 30.7 (IQR, 23.3–40.7) and 35.3 (IQR, 25.3–49.7) minutes ($p < 0.001$). These results evidence that the GloboDiet software is viable for the routine of an epidemiological study.

Keywords: epidemiological study; GloboDiet; 24-h dietary recall; dietary assessment; feasibility

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1. Introduction

In nutritional epidemiological studies, the food frequency questionnaire (FFQ) is one of the most used methods to collect dietary intake data, as it is easy to apply with relatively low operational cost and an effective tool to obtain habitual food intake. However, FFQs inevitably have systematic errors due, in part, to the failure to capture the entire diet and to respondents' difficulty in recalling their eating habits in the period covered by the FFQ (for example, in the last few weeks or months) [1–3].

Currently, the 24-h dietary recall (24H-DR) method, with multiple applications, has become prominent in epidemiological studies when the purpose is to assess the association between diet and health outcomes [3–5]. The 24H-DR consists of defining and quantifying in detail the foods and drinks consumed within the 24 h preceding the interview, being considered less biased when compared to other methods based on self-report and, therefore, the best food assessment tool for many purposes [3,5,6].

The first experience of developing a standardized and computerized methodology for the 24H-DR collection was proposed by the International Agency for Research on Cancer (IARC) through the development and validation of the EPIC-Soft software [7]. The EPIC-Soft was initially used as a calibration method in the study European Prospective Investigation into Cancer and Nutrition (EPIC) [8–10]. Based on the successful European experience, the methodology developed for EPIC-Soft has been used in other regions such as Asia, Africa and Latin America, allowing for global comparison of food consumption

data and offering a unique opportunity to link research and monitoring activities in food and nutrition [11–13]. As a result of the expansion of EPIC-Soft to other regions of the world, in 2014, this project became known as GloboDiet software. In the Brazilian version of the GloboDiet software, all databases of food, recipes, dietary supplements and quantification methods have been created and/or adapted to the Brazilian context [14].

Despite the consensual superiority in the accuracy of the 24H-DR method as compared to other methods based on self-report, there is still a gap in knowledge regarding the feasibility of using this method, particularly in cohort studies. Feasibility studies enable researchers to assess whether ideas and discoveries on a given topic can be shaped and applied to different contexts, whether research methods and protocols need modification and also how changes can occur or not [15].

In Brazil, from 2008–2010, the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil), a multicenter cohort study that aims to identify factors associated with the incidence of diabetes and cardiovascular diseases in Brazil, has been following active and retired civil servants from six educational and research institutions from three major Brazilian regions [16,17]. Diet assessment in the ELSA-Brasil baseline was evaluated through a semi-quantitative 114-item FFQ developed and validated for this purpose [18,19]. In the third wave of the ELSA-Brasil, a second measure of the FFQ was applied, together with two 24H-DR with the aid of the GloboDiet software. However, the participants' adherence process and the duration of face-to-face and by telephone 24H-DR interviews carried out with the aid of the GloboDiet software were yet to be described. This information would allow the assessment of the feasibility of using the software, as well as it would assist in the planning of the data collection, verifying whether sociodemographic variables can influence both the adherence to and the duration of the interviews. Thus, the aim of the present study was to assess the feasibility of the Brazilian version of the GloboDiet software and contribute to the advancement of research on diet assessment in the Brazilian population.

2. Materials and Methods

2.1. Study Design

This was a feasibility study conducted in the third wave of the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil), which took place between 2017 and 2018 (20 months). Briefly, the ELSA-Brasil is a multicenter and ongoing cohort study conducted in six Brazilian cities (São Paulo, Rio de Janeiro, Salvador, Porto Alegre, Belo Horizonte and Vitoria) from three major Brazilian regions (northeast, southeast and south), which enrolled 15,105 civil servants from five universities and one research institute. The study design and data collection were described previously [16,17,20]. The present study was performed with individuals from the São Paulo Research Center at the time of data collection for the third wave of the ELSA-Brasil (n = 4197).

2.2. Ethical Aspects

ELSA-Brasil was approved by the research ethics committees of all research centers. All participants volunteered and signed an informed consent form. This study was also approved by the research ethics committee of School of Public Health at University of São Paulo (number 07944419.7.0000.5421).

2.3. Procedure

2.3.1. Recruitment

Participants from the São Paulo Research Center (n = 4197) were invited to participate in this study. Of them, 677 immediately refused, and 3520 scheduled the first 24-h dietary recall (24H-DR) measurement. Only participants who performed the first measurement were invited to schedule the second 24H-DR measurement.

2.3.2. Data Collection

Two 24H-DR were applied with the aid of the Brazilian version of the GloboDiet software. Briefly, this software is a tool that makes it possible to standardize the data collection from standardized sections: (i) general information about the interviewee; (ii) quick list for inserting food and recipes consumed on the previous day, accompanied by the time and place of their consumption; (iii) description of food using facets (questions) and descriptors (answers); (iv) quantification of reported food and beverages; (v) survey questions; (vi) final quality controls and (vii) insertion of food supplements consumed on the recorded day. The first 24H-DR measurement was performed face-to-face, and the second measurement preferably by telephone. However, the option of carrying out the second measurement face-to-face was also given to participants who were not able to perform it over the phone.

The information regarding the participants' adherence process was obtained from two control worksheets completed by the interviewers after the end of the first (face-to-face) and second (preferably by telephone) measurement interview attempts. In these worksheets, the interviewers filled in the columns with (i) the participant's identification number; (ii) the participant's full name; (iii) name of the interviewer; (iv) date and time of the interview and (v) status of the interview filled according to the number of contact attempts set forth for each measurement (limit of four contact attempts for the first measurement and five for the second measurement).

In order to estimate the adherence, refusal and non-response rates of participants to each contact attempt, Equations (1)–(3) were considered, respectively, as follows:

$$\frac{Total\ of\ participants\ carrying\ out\ the\ interview}{Number\ of\ contacted\ participants} \times 100 \quad (1)$$

$$\frac{Total\ of\ participants\ refusing\ the\ interview}{Number\ of\ contacted\ participants} \times 100 \quad (2)$$

$$\frac{Total\ of\ eligible\ participants\ not\ reaching\ a\ complete\ interview}{Number\ of\ contacted\ participants} \times 100 \quad (3)$$

Total adherence, refusal and non-response rates of participants to each 24H-DR measurement were also calculated considering all contact attempts, using Equations (4)–(6), respectively, as follows:

$$\frac{Total\ of\ participants\ carrying\ out\ the\ interview\ of\ the\ 1st\ or\ 2nd\ measurement}{Number\ of\ contacted\ participantsin\ the\ 1st\ attempt} \times 100 \quad (4)$$

$$\frac{Total\ of\ participants\ refusing\ the\ interviewof\ the\ 1st\ or\ 2nd\ measurement}{Number\ of\ contacted\ participantsin\ the\ 1st\ attempt} \times 100 \quad (5)$$

$$\frac{Total\ of\ eligible\ participants\ not\ reaching\ a\ complete\ interviewv\ of\ the\ 1st\ or\ 2nd\ measurement}{Number\ of\ contacted\ participantsin\ the\ 1st\ attempt} \times 100 \quad (6)$$

In order to assess the duration of the first and second measurements of the 24H-DR interviews, the file "INTGI" generated by the GloboDiet software was used. This file has variables that describe the time spent with each stage of the interview: (i) initial registration (time_gi); (ii) Quick list (time_ql); (iii) description and quantification of the food taken (time_dq) and (iv) time of the complete interview (time_all). Using this file to check for possible typos made during the filling out by the interviewers, the identification numbers of the participants were checked against the official database of the ELSA-Brasil study.

2.4. Statistical Analyses

To evaluate the adherence process of the participants in the study, the participants were grouped according to gender (male and female) and age (<60 years for adults and $\geq$60 years for older adults) groups. The Chi-square test was used to assess the differences between these sociodemographic groups on the frequency of adherents, refusing and non-responders' participants.

In order to assess the duration of the interviews of the participants who performed the first (face-to-face) and second (preferably by telephone) 24H-DR measurements, the normality of the data was tested by using the Shapiro–Wilk test. Due to the non-normality of the data, descriptive statistics procedures were used for continuous variables in the median and interquartile range (IQR) Q1–Q3 (25–75%). The non-parametric tests of Mann–Whitney and Kruskal–Wallis were used to analyze the differences between the categories of gender (male and female), age (<60 years for adults and ≥60 years for older adults) and body mass index (BMI) classes for adults (low weight: <18.5 kg/m^2; normal weight: ≥18.5 and <25 kg/m^2; overweight and obesity: ≥25 kg/m^2), and for older adults (low weight: ≤22 kg/m^2; normal weight: >22 and <27 kg/m^2; overweight and obesity: ≥27 kg/m^2) on the total duration time and the stages of the 24H-DR interview. Dunn's post hoc test was used for pairwise comparisons following the Kruskal–Wallis test in order to determine difference between two groups.

All statistical analyses were performed with the aid of the STATA® (Statistical Software for Professionals, College Station, TX, USA), version 14.2, assuming a significance level of 5%.

3. Results

3.1. Adherence Process of the Participants in the Study

In a first attempt to carry out the face-to-face 24H-DR measurement, immediate adherence, refusal and non-response rates of 73.5%, 4.7% and 21.8% were estimated, respectively. Among those participants who were contacted two or more times, adherence rates dropped to 56.8% in the second, 59.1% in the third and 50.0% in the fourth contact attempts. In the second contact, a remaining refusal rate of 5.4% was observed, whereas the rates of absence or rescheduled were 37.8% in the second, 40.9% in the third and 50.0% in the fourth contact attempts (Table 1).

Table 1. Adherence process to the first (face-to-face) 24H-DR measurement amongst the participants in the third wave of the ELSA-Brasil study. São Paulo, 2019.

Interview Status	1st Contact (*n* = 3520)	2nd Contact (*n* = 501)	3rd Contact (*n* = 66)	4th Contact (*n* = 12)	Total * (*n* = 4099)
Refused	166 (4.7)	27 (5.4)	-	-	193 (4.7)
Carried out	2584 (73.5)	284 (56.8)	39 (59.1)	6 (50.0)	2913 (71.1)
Rescheduled	178 (5.0)	27 (5.4)	5 (7.6)	-	210 (5.1)
Absence	592 (16.8)	162 (32.4)	22 (33.3)	6 (50.0)	782 (19.1)

Data are absolute count (percentage). * Total contact attempts (considering repetitions).

Considering the total contact attempts repetitions, the rates of interview status were carried out (71.1%), refused (4.7%) or not carried out (24.2%) (Table 1), accounting for a total adherence, refusal and non-response rates to the first 24HR measurement (face-to-face) of 82.8%, 5.5% and 11.8%, respectively.

There was no statistically significant difference between men and women in relation to the frequency of responders, refusing or non-responders to the first 24H-DR measurement ($p = 0.293$). Regarding the age group, older adults had higher frequencies of refusing and non-responders ($p < 0.001$) (Table 2).

Table 2. Frequency of adherents, refusing and non-responders to the first (face-to-face) and second (preferably by telephone) 24H-DR measurements, according to gender and age of the participants in the third wave of ELSA-Brasil. São Paulo, 2019.

First 24H-DR (*n* = 3520)						
	Gender			**Age**		
Final Participant Status	**Men (*n* = 1543)**	**Women (*n* = 1977)**	***p*-Value**	**Adults (*n* = 1969)**	**Older Adults (*n* = 1551)**	***p*-Value**
Non-responder **	182 (11.9)	232 (11.7)		187 (9.5)	227 (14.6)	
Responders	1266 (82.0)	1647 (83.3)	0.293	1712 (87.0)	1201 (77.4)	**<0.001**
Refusing	95 (6.1)	98 (5.0)		70 (3.5)	123 (8.0)	
Second 24H-DR (*n* = 1585)						
Final Participant Status	**Men (*n* = 697)**	**Women (*n* = 888)**	***p*-Value**	**Adults (*n* = 801)**	**Older Adults (*n* = 784)**	***p*-Value**
Non-responder **	197 (28.2)	287 (32.1)		171 (21.2)	313 (39.4)	
Responders	491 (70.4)	593 (66.9)	0.281	625 (78.1)	459 (58.6)	**<0.001**
Refusing	9 (1.4)	8 (1.0)		5 (0.7)	12 (1.6)	

Data are absolute count (percentage); Pearson's chi-square test was used; ** Participant missed rescheduled, had technical problems or was unavailable.

In the first attempt to carry out the second 24H-DR measurement (preferably by telephone), immediate adherence, refusal and non-response rates of 52.3%, 0.8% and 46,9% were estimated, respectively. Among those with whom two or more telephone contacts were performed, adherence rates dropped to 47.3%, 38.9% and 26.8% at the second, third and fourth contacts but raised to 63.1% at the last established attempt (Table 3). Notwithstanding, non-response due to rescheduling, technical issues, unavailability or missed calls was lower in the fifth contact (36.9%) in comparison to the fourth (73.2%), third (59.5%) and second (51.9%) attempts. Refusal rates of 0.8% and 1.6% were still observed at the second and third contacts (Table 3).

Table 3. Adherence process to the second 24H-DR measurement amongst the participants in the third wave of the ELSA-Brasil study. São Paulo, 2019.

Interview Status	**1st Contact (*n* = 1585)**	**2nd Contact (*n* = 387)**	**3rd Contact (*n* = 126)**	**4th Contact (*n* = 41)**	**5th Contact (*n* = 19)**	**Total * (*n* = 2158)**
Answered call	1.338 (84.4)	317 (81.9)	92 (73.0)	31 (75.6)	15 (79.0)	1793 (83.1)
Refused	12 (0.8)	3 (0.8)	2 (1.6)	-	-	17 (0.8)
Carried out	829 (52.3)	183 (47.3)	49 (38.9)	11 (26.8)	12 (63.1)	1.084 (50.2)
Rescheduled	190 (12.0)	55 (14.2)	14 (11.1)	8 (19.6)	-	267 (12.4)
Technical issues	35 (2.2)	14 (3.6)	4 (3.2)	-	1 (5.4)	54 (2.5)
Unavailability	272 (17.1)	62 (16.0)	23 (18.2)	12 (29.2)	2 (10.5)	371 (17.2)
Missed call	247 (15.6)	70 (18.1)	34 (27.0)	10 (24.4)	4 (21.0)	365 (16.9)

Data are absolute count (percentage). * Total contact attempts (considering repetitions).

Considering the attempts repetitions, 50.2%, 0.8% and 49.0% of all contacts resulted in a complete, a refused or a not carried out interview (Table 3), accounting for total adherence, refusal and non-response rates to the second 24H-DR measurement (preferably by telephone) of 68.4%, 1.0% and 30.6%, respectively.

No statistically significant differences were found in the frequency of adherents to the second 24H-DR measurement between men and women ($p = 0.281$), but there was a tendency towards higher frequencies of refusing and non-responders amongst older adults when compared to the adults ($p < 0.001$) (Table 2).

3.2. Duration of the Interviews for the First and Second Measurements

Interviews conducted face-to-face and preferably by telephone took 30.7 min and 35.3 min to be completed, respectively (Table 4).

Table 4. Duration of the first (face-to-face) and the second (preferably by telephone) 24H-DR measurements amongst participants in the third wave of the ELSA-Brasil study in São Paulo-SP. São Paulo, 2019.

Stages of the Interview	First 24H-DR (*n* = 2913)	Second 24H-DR (*n* = 1084)
	Duration (minutes) *	Duration (minutes) *
General information	3.4 (2.8–4.9)	3.6 (2.1–6.5)
Quick list	4.8 (3.6–6.4)	5.2 (4.0–7.0)
Description and quantification	20.9 (15.3–28.8)	23.9 (16.5–34.1)
Full interview	30.7 (23.4–40.7)	35.3 (25.3–49.7)

* Data are median (interquartile range).

In the first 24H-DR measurement, women took longer than men in almost all of the stages of the interview, except for the quick list one (Table 5). Older adults took longer than adults in all of the stages of the interview, thus extending the duration of the complete interview (Table 5).

Table 5. Duration of the first (face-to-face) and the second (preferably by telephone) 24H-DR measurements, according to the gender of the participants in the third wave of ELSA-Brasil. São Paulo, 2019.

First 24H-DR (*n* = 3520)						
	Gender			Age		
Final Status of the Interview	Men (*n* = 1266)	Women (*n* = 1647)	*p*-Value	Adults (*n* = 1712)	Older Adults (*n* = 1201)	*p*-Value
General information	3.3 (2.3–4.6)	3.5 (2.4–5.2)	**<0.001**	3.3 (2.3–4.7)	3.6 (2.6–5.2)	**<0.001**
Quick list	4.7 (3.5–6.2)	4.9 (3.7–6.4)	0.074	4.7 (3.6–6.2)	5.0 (3.7–6.6)	**0.001**
Description and quantification	20.2 (14.8–27.9)	21.5 (15.7–29.3)	**0.002**	20.6 (15.1–27.9)	21.6 (15.4–29.6)	**0.026**
Full interview	29.5 (22.5–39.7)	31.5 (24.1–41.6)	**<0.001**	29.7 (23.1–39.6)	32.0 (23.8–42.4)	**<0.001**
Second 24H-DR (*n* = 1585)						
Final Status of the Interview	Men (*n* = 491)	Women (*n* = 593)	*p*-Value	Adults (*n* = 625)	Older Adults (*n* = 459)	*p*-Value
General information	3.5 (2.1–6.3)	3.6 (2.1–6.6)	0.895	3.3 (2.0–6.5)	3.7 (2.4–6.5)	**0.011**
Quick list	5.1 (3.9–7.0)	5.3 (4.0–7.0)	0.450	5.2 (4.0–6.9)	5.2 (4.0–7.0)	0.957
Description and quantification	23.2 (16.4–34.0)	25.1 (16.6–34.1)	0.503	23.7 (16.4–33.4)	24.3 (16.6–35.4)	0.483
Full interview	34.8 (25.5–50.7)	36.0 (25.2–47.7)	0.943	35.3 (25.4–48.8)	35.3 (25.3–50.8)	0.459

As to the second 24H-DR measurement (preferably by telephone), older adults took longer than adults in the initial registration stage. However, in the other stages of the interview, no difference was observed between the two age groups, differing from the findings regarding the face-to-face interviews (Table 5). Overweight and obese participants were more likely to spend less time interviewing as compared to normal weight and underweight, with the exception of the initial registration stage (Table 6). In the second 24H-DR measurement, only the Quick list stage was associated with the BMI of the participants (Table 6).

Table 6. Duration of the first (face-to-face) and second (preferably by telephone) 24H-DR measurement according to the nutritional status of participants in the third wave of the ELSA-Brasil study in São Paulo-SP. São Paulo, 2019.

Stages of the Interview	First 24H-DR Duration in Minutes *			*p*-Value	Second 24H-DR Duration in Minutes *			*p*-Value
	Underweight (*n* = 118)	Normal Weight ** (*n* = 924)	Overweight and Obesity ** (*n* = 1852)		Underweight (*n* = 50)	Normal Weight **(*n* = 346)	Overweight and Obesity ** (*n* = 688)	
General information	3.5 (2.7–5.2)	3.4 (2.4–4.9)	3.4 (2.3–4.9)	0.497	3.4 (2.7–8.9)	3.6 (2.1–6.3)	3.5 (2.1–6.4)	0.945
Quick list	5.3 (4.3–6.7)	5.1 (3.9–6.8)	4.7 (3.5–6.2)	**<0.001**	6.0 (4.3–8.5)	5.4 (4.2–7.0)	5.1 (3.8–6.8)	**0.004**
Description and quantification	22.5 (16.0–30.5)	21.8 (16.0–29.7)	20.6 (15.0–28.3)	**0.013**	27.5 (17.9–43.3)	25.2 (16.3–35.5)	23.1 (16.5–32.1)	0.067
Full interview	33.0 (25.0–42.5)	32.0 (24.0–41.6)	30.0 (22.9–40.2)	**0.003**	40.5 (26.1–62.2)	36.8 (24.8–52.4)	34.3 (25.5–48.0)	0.095

* Data are median (interquartile range); ** Significant difference between the normal weight and overweight and obesity categories, based on Dunn's post hoc test; the Kruskal–Wallis test was used.

4. Discussion

This research aimed to study the feasibility of implementing the 24HR method in the routine of a cohort study when guided by the Brazilian version of the GloboDiet software. The participants' total adherence rates were 82.8% for the first (face-to-face) and 68.4% for the second (preferably by telephone) 24H-DR measurements. The median duration of these interviews was 31 min in the first 24H-DR measurement and 35 min in the second one.

Brustad et al. [21] (2003), in a study placed in Norway, comparing the 24H-DR face-to-face and telephone interviews using the EPIC-Soft software, also observed superior adherence to the face-to-face interview (69.4%) in relation to the interview by phone (60.6%). The authors believe that these results might be associated with the thought of greater importance and integrity of an interview conducted face-to-face than one conducted by telephone.

In a feasibility study carried out by DeBiasse et al. [22] (2018), who also applied two 24H-DR measurements, there was a loss of 11% of participants in the second measurement, performed face-to-face. However, in the present study, we observed a higher loss of participants in the second 24H-DR measurement, totaling 31.6%. However, in our study, due to the limitations of the financial resources for paying the interviewers, it was not possible to contact all of the participants considered eligible for the second 24H-DR measurement, which could explain our high loss of follow-up. In the present study, elderly individuals adhered less to the first (face-to-face) 24H-DR measurement as compared to the adults since they missed, rescheduled and refused them more in this stage. Older adults may face a combination of obstacles capable of influencing the adherence, including comorbidity, economic restrictions, communication problems (hearing difficulties that interfere with telephone interviews and impaired vision that affects written research), physical immobility that restricts the options for transportation, and they may need a caregiver to help them, among others [23]. We agree with Areán et al. [24], who suggest that new adherence strategies and adaptations in the study design need to be adopted in order to increase the participation of older adults in epidemiological surveys.

The medians of the duration of the interviews found in this study corroborate the indications of time needed to conduct interviews when using GloboDiet (25–45 min), which are comparable with the costs and logistical limitations of large nutritional studies [25–27].

It has been discussed in the literature that the number of facets (dietary characteristics) offered to the interviewer for the insertion of a food item into the GloboDiet software might be related to a longer interview time. Therefore, a study by Zhang et al. [28] (2019) showed that excluding 35% of the less important facets can improve collection efficiency and save a median of 5 min of the interview.

In this study, it was observed that women tend to take more time than men in all of the stages of the face-to-face interview. This might be because women are still primarily

responsible for preparing meals in their homes [29], so they can offer more details of what was consumed in the twenty-four hours before the interview.

Similarly to women, older adults tend to take longer than adults in all of the stages of face-to-face interviews. According to de Vries et al. [30] (2009), older adults have greater difficulties with open and short-term dietary measurements; however, until now, this hypothesis has not been confirmed in nutritional studies. Therefore, as highlighted by Campos et al. [31] (2000), it is essential to carry out specific training with the interviewers on how to assist these individuals during the report of their food consumption.

In this study, participants classified as overweight and obese took less time to complete almost all of the stages of the interview when compared to normal-weight participants, which can be a strong indication of underreporting of the foods consumed. According to Hebert et al. [32] (1995), dissatisfaction with body image and desire for social adjustment observed in obese people have been described as contributing to the increase in the prevalence of underreporting, corroborating the findings of Avelino et al. [33] (2014), which say that individuals dissatisfied with their body weight were 49% more likely to underreport than those who were satisfied with their body weight.

Despite the fact that the total interview time presented here is considered long by some researchers, at the end of the interview, the researcher would already have a database available with the collected information, while, in the collection of the 24H-DR data on paper, there is a need for time and resources for the post-collection stages, such as the standardization of home measurements in units of weight and volume [14].

The limitations of our study should be highlighted. Firstly, the study was not designed to examine the causes of the longer or shorter durations of the interviews nor to examine the differences in the second 24H-DR measurement carried out by telephone or face-to-face. However, from these results, hypotheses were raised that could be tested in future studies. Secondly, no anthropometric data were collected from refusing and non-responders' participants, precluding us from testing associations of participants' nutritional status with the adherence process, as performed during the duration of the interviews. Additionally, it is worth noting that the conflict in data collection periods between the present study and the third wave of the ELSA-Brasil study, which had to be completed in parallel, also affected the recruitment of participants to the second 24H-DR measurement. Finally, during the development of this study, we did not have access to updated official data on response rates for other forms of dietary data collection in the wave of the ELSA-Brazil study, which would be very useful for comparison with the current approach using GloboDiet software, reinforcing the feasibility of this tool applied to epidemiological studies.

On the other hand, the major strengths of the present study include the 20-month collection period, allowing for a relatively large sample size for this type of research. This is the first feasibility study of the Brazilian version of GloboDiet, allowing other researchers interested in using this software to have a starting point for formulating and adapting the design of their studies. Furthermore, parallel to this article, a manual was prepared to assess food consumption in epidemiological studies with the GloboDiet software [34], which presents standardized operational procedures for the pre-collection, collection and post-collection stages of the 24H-DR measurement/interview when using the aforementioned software.

From the results on the participants' adherence process and the interview duration, it was possible to evidence that the GloboDiet software is feasible in the routine of an epidemiological study.

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