Replicability of the Questionnaire Assessing the Addition of IN NATURA Vegetable Oil to the Child's Diet

Beatriz Araújo Cassane Martins[1], Haydée Serrão Lanzillotti[2*] and Maria Elisa Barros[2]

[1]*Undergraduate Course in Nutrition, State University of Rio de Janeiro, Rio de Janeiro, Brazil.*
[2]*Department of Social Nutrition, State University of Rio de Janeiro, Rio de Janeiro, Brazil.*

Authors' contributions

This work was carried out in collaboration among all authors. Author BACM organized the bibliographic searches, created the database to elaborate the model's input matrix and participated in the data analysis. Author HSL designed the study, performed the statistical analysis and wrote the first draft of the manuscript. Author MEB verified the analyzes of the study, revised the manuscript for final writing and guided the author BACM in the course completion work that resulted in this manuscript. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Objective: To verify the replicability of the questionnaire Assessing the Addition of *IN NATURA* Vegetable Oil to the Child's Diet". Study design: observational cross-sectional study.
Place and Duration of Study: The study was carried out in two pediatric outpatient clinics, one of which refers to a health plan operator (SJM), municipality of São João de Meriti (RJ) and the other, at the Polyclinic Piquet Carneiro of the University from the State of Rio de Janeiro (PPC/UERJ), municipality of Rio de Janeiro (RJ), from March 2017 to January 2019.
Sample: Responsible for children feeding, that is, those who buy the food prepare it or serve meals. SJM, n=150 and PPC/UERJ; n=150.
Methodology: Doornik-Hansen test verified the Multivariate normality of the scores distribution of the items according to Likert scale. Kaiser-Meyer-Olkin was used as a criterion for identify the

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*Corresponding author: E-mail: haydeelan@gmail.com;

adequately of sample for the data adjustment. Conbrach's alpha indicated the internal consistency (coherence) between items on each dimension. The reproducibility by reliability was tested by test-retest by using the weighted Kappa coefficient.

Results: Multivariate normality of the SJM scores: (chi^2 (22)=602.969 Prob chi^2=.0000) and PPC/UERJ: (chi^2(22)=411.666 Prob chi^2=.0000), adequacy of the samples, KMO: SJM=0.78 to 0.92 and PPC/UERJ=0.76 to 0.92, internal consistency of dimensions (Dimension 1 and 2) by Cronbach's alpha greater than 0.75 for SJM and PPC/UERJ, reproducibility of the questionnaire by weighted Kappa: 0.90 (*p value.*008), t test for two independent samples, SJM and PPC/UERJ: significant difference for Dimension 1, but not for Dimension 2.

1. INTRODUCTION

In the pandemic times of COVID-19, caused by the SARS-CoV-2 virus, there is a decline in the food security of the Brazilian population among the least favored groups, with the possibility of an increase in child malnutrition.

Data from the National Survey on Food Insecurity in the Context of the Covid-19 Pandemic in Brazil (n=2180 households in urban and rural areas), carried out in 2020, reveal an epidemic peak of hunger, that is, more than half of the Brazilian population is in a situation of food insecurity, and at a more serious level the percentage is 9% of the total population. This represents 19 million Brazilians living with hunger. For the group with mild food insecurity, the pandemic reduced family income due to job losses and indebtedness, causing cuts in essential expenses. Public policies are necessary to assist the most vulnerable population groups and promote Food and Nutritional Security [1]. In this sense, the Brazilian government created the Emergency Aid [2,3], which, however, is a low-value aid and limited duration.

The implementation of the "Bolsa Família" Program (Family Income), created in January 2004, with the objective of reducing hunger and poverty for the most vulnerable population, is currently the main policy of the federal government to promote the social inclusion of beneficiary families. This initiative had an important impact in decreasing infant mortality, with a greater impact, if the cause of death was due to diarrhea or malnutrition [4].

The advance of the pandemic brought about a reduction in the purchasing power of families and an increase in food prices. According to data from the Brazilian Institute of Geography and Statistics - IBGE, in approximately one year (2020-2021) the price of food increased by 19.40%, with the four products that most influenced were derived from soybeans, beef, soybean oil and rice [5].

This scenario results in the retraction of food consumption, particularly of nutritionally healthier foods. The most vulnerable population sees itself in the imposition of replacing *in natura* foods and minimally processed foods with low-cost by ultra-processed foods, aggravating the situation of Food and Nutritional Insecurity [6,7].

The impact with the current high prevalence rate of the global of COVID-19 did not affect eating habits only in Brazil. Agyei-Amponsah et al. [8] reported that the diet choices were skewed toward eating healthier homemade foods to boost the immunity (increase in fruit consumption). This is a trend that can assist in the nutritional security of the child population. However, it cannot be denied that this dietary practice is far from being reached by the most vulnerable Brazilian child group. The addition of vegetable oil to the child's diet is intended to supply it with polyunsaturated fatty acids, essential fatty acids, which are not synthesized by the body.

Among vegetable oils, soy oil is suggested. Two reasons justified the suggestion. The first is that in Brazil soy oil is the one with the lowest cost and, consequently, the most consumed by the low-income population and has been part of the basic food basket [9]. The second is due to its composition in fatty acids. The five major fatty acids in soybean oil are, among the saturated, palmitic (C16; 11%) and, stearic (C18; 4%) and among the unsaturated, oleic (omega-9; 25%), linoleic (omega-6; 52%) and linolenic (omega-3; 8%). It is also worth mentioning the presence of Vitamin A [10,11,12] which contributes to the prevention of this vitamin deficiency.

At six months of age, complementary feeding starts with the inclusion of cereals, roots, tubers, beans, vegetables, meats, eggs and fruits in small portions, which are gradually being increased, following the guidelines of the Food Guide for Brazilian Children under 2 years old [13].

The recommendation of the Ministry of Health, Brazil, expressed in this guide is for the child to receive "homemade" food, that is, meals using *in natura* and minimally processed foods. The reasons for this are to strengthen cultural traditions and to avoid food ultra-processed, "ready to eat" foods, since they contain a lot of sodium, saturated and / or trans fats, sugars and additives such as sweeteners, food colors and food preservatives [13]. Child malnutrition is a situation characterized by a deficiency of nutrients in the child's body due to the decrease in food consumption [7], a tragedy expected in the post-pandemic.

In 2013, the Ministry of Health of Brazil recommended as a joint strategy to take care of child malnutrition the addition of *in natura* vegetable oil to increase the energy density of the diet, a recommendation published in the manual "Ten steps to a healthy diet", directed to mothers and health professionals [14]. This practice can contribute to recover the body weight of malnourished children and avoid stunting, which can be one of the consequences, among so many, in post-COVID-19.

It is important to emphasize that the use of *in natura* vegetable oil of addition does not present an age limit, since the intention is to increase the energy density of the diet. One gram of vegetable oil provides 9 kcalories, unlike the protein and carbohydrates that provide 4 Kcalories per gram. However, the added oil should not exceed 3% of the volume of the meal [14], which for the child can started from six months of age with the addition of half a teaspoon (1ml) and from two years a teaspoon (2 ml) increasing to one dessert spoon (5 ml). The results of a study by Coleman et al. [15] showed that both oleic and linoleic fatty acid (medium chain) has demonstrated its ability to increase satiety. These authors point out that it is possible that taking a dose of at least 25 ml of *in natura* vegetable oil at breakfast can reduce energy intake during the day. So, it is important not to exceed the amount recommended by the mentioned food guide [14].

In difficult times, in areas where populations are most neglected, the addition of *in natura* vegetable oil in the children's diet can be considered a low-cost strategy for increasing the energy density of the diet and can also be considered as an accessible treatment carried out by the family itself.

The question that arises is whether those responsible for feeding the child would be willing to adopt such a dietary practice.

Lanzillottti et al. [16] proposed a questionnaire to assess the adoption of *in natura* vegetable oil in addition to the children's diet. The instrument "Questionnaire to assess the adoption of *in natura* vegetable oil in addition to the children's diet" aims to evaluate the adoption of such practice. So we are proposing a replicability study since the application of the questionnaire on different occasions allows searching for evidence of reproducibility which show the premises for the instrument's efficiency and effectiveness [17].

The contribution of the present study was to present a questionnaire that helps to identify the behavioral manifestation in relation to the adoption of *in natura* vegetable oil in addition to the children's diet.

Given the above, the objective of the present study was to verify the replicability of the questionnaire assessing the Addition of *IN NATURA* Vegetable Oil to the Child's Diet".

2. METHODOLOGY

2.1 About the Questionnaire

The questionnaire, an instrument for the study of reproducibility, was based on the psychometric evidences of the "Questionnaire to assess the adoption of vegetable oil *in natura* (raw) for addition to the children's diet" [16]. It has two dimensions: Dimension 1- "Benefits of adding *in natura* vegetable oils to the children's diet" and Dimension 2 - "Possible problems related to adding *in natura* vegetable oils to the children's diet", with 7 and 4 items, in the respective dimensions. It was prepared on a Likert scale of five points of agreement for response (5-strongly agree; 4-agree; 3-neither agree / nor disagree; 2-disagree; 1-disagree very much) (Table 1).

Table 1. Questionnaire to assess the adoption of natural *in natura* vegetable oil (raw) of addition in the children's diet

Items	Dimension 1 **Benefits of adding *in natura* vegetable oils to children's diet Items**	Items	Dimension 2 **Possible problems related to the addition of *in natura* vegetable oils to the children's diet**
i4-P	Putting raw vegetable oil in the child's food improves the situation of the underweight child.	i1-N	Putting raw vegetable oil in the child's food worsens the situation of the underweight child.
i6-P	Using raw vegetable oil in the child's food improves the child's immunity.	i3-N	Putting raw vegetable oil in the child's food causes nausea.
i7-P	If I add raw vegetable oil to the child's food, he will not be overweight.	i8-N	Putting raw vegetable oil in the child's food causes vomiting.
i9-P	It is good for the child to put raw vegetable oil in the bottle.	i14-N	The use of raw vegetable oil every day causes diarrhea.
i10-P	Using raw vegetable oil in children's food improves their resistance to transmissible diseases.		
i13-P	Adding raw vegetable oil does not raise the child's cholesterol.		
i15-P	The right thing is not to sauté the child's food and put the raw vegetable oil after the ready salted pap.		.

Note: i: item, P: positive item, N: negative item.
Source: [7]

When interpreting the results of the scale, the highest concordance scores (scores 4 and 5) represent the respondent's greater cognition about the benefits of using *in natura* vegetable oil in addition to the children's diet for children with low weight (Dimension 1). However, the higher scores in the dimension "Possible problems related to the addition of *in natura* vegetable oils to the children's diet" (Dimension 2) indicate the probable non-adoption of this practice. The score 3 and values around 3 indicate doubts about benefits or problems related to the use of *in natura* vegetable oil in addition to the children's diet.

The analysis of the psychometric properties of the "Questionnaire to assess the adoption of *in natura* (raw) vegetable oil in addition to children's diets" [16] sought internal consistency using Cronbach's alpha coefficient, which reached the values of $\alpha=0.80$ (0.75 to 0.85) for Dimension 1 and $\alpha=0.74$ ($\alpha 0.68$ to $\alpha 0.81$) for Dimension 2, with the coefficient for all items being $\alpha=0.84$ ($\alpha=0.80$ to $\alpha=0.88$).

The convergent factorial validity reached values of 0.3443 and 0.2994 for Dimension 1 and Dimension 2 respectively, which does not allow affirming that the items share a high variance in common in each dimension. However, the discriminant validity presented values of 0.5868 and 0.5472 for Dimension 1 and Dimension 2 respectively, which allow inferring the two-dimensionality of the questionnaire, given the correlation between Dimension 1 and Dimension 2, presenting a value of -0.4042.

2.2 The Present Study

This is a cross-sectional study carried out in two pediatric outpatient clinics, one of which refers to a health plan operator (SJM), municipality of São João de Meriti (RJ) and the other, at the Polyclinic Piquet Carneiro of the University from the State of Rio de Janeiro (PPC/UERJ), municipality of Rio de Janeiro (RJ), from March 2017 to January 2019. The present study used secondary data from the project database.

It was chosen as an inclusion criterion for the application of the questionnaire that the research participants were responsible for feeding child. That is, those who buy the food prepare it or serve meals, since this situation can be considered a dietary intervention. Data collection at both locations was performed by a properly trained Nutrition student. The time of greatest attendance flow was chosen.

The participants were interviewed in the waiting room of the pediatric outpatient clinic. Initially the objective of the research was explained and then the invitation to participate. Once the invitation was accepted, the signing of the Free and Informed Consent Form was requested and the questionnaire was then applied.

2.3 Data Analysis

The data obtained generated an input matrix for the model whose purpose was to verify if it would be able to capture the construct "Adoption of *in natura* vegetable oil in addition to the children's diet", that is, to seek the legitimacy of the behavioral representation of the latent traits of the construct [17,18].

Initially, multivariate normality between the distribution of scores was tested using the Doornik-Hansen test [19], a test that uses asymmetry and kurtosis, and the Kaiser-Meyer-Olkin test (KMO) as a criterion for identify whether the factor analysis model being used is adequately adjusted to the data to assess the internal consistency of the dimensions, using the cut-off point ≥ 0.50 [20].

The internal consistency was assessed by Cronbach's alpha point estimate and its confidence intervals (CI 95%), being considered, for exploratory research, an acceptable value of α=0.60 [21]. For the calculation of the confidence interval, the bootstrap method with 1000 replications was used.

Cronbach's alpha coefficients range from "zero to one", with "zero" indicating a total absence of consistency (coherence) between items, and "one" by indicating 100% internal consistency [22]. A maximum alpha value of 0.90 is recommended, since higher values indicate unnecessary redundancy rather than a desirable level of internal consistency [23].

The index of measurement error [24] was calculated by

$$1 - \alpha^2$$

where α is the alfa de Cronbach.

Reproducibility was tested by test-retest. Those responsible for feeding the child were interviewed by the same interviewer on two separate occasions and locations, in order to test the stability (reproducibility) of the instrument in time and space [24,25]. The agreement estimate was verified by the weighted Kappa coefficient considering the items related to dimensions 1 and 2 of the questionnaire. The interpretation of the weighted Kappa coefficient was based on the classification proposed by Landis and Koch [26] whose agreement is classified as absent when ≤ 0 (Zero), slight between 0.00 and 0.20, weak between 0.21 and 0.40, moderate between 0.41 to 0.60, substantial between 0.61 and 0.80 and almost perfect between 0.80 and 1.00. However, Streiner's warning was considered [23].

The proposal to use an ordinal scale with scores for the items of the instrument made it possible to classify those responsible for child feeding in two categories: "likely supporters" to the use of the practice recommended by the Ministry of Health (average of the Dimension 1 scores) and "likely non-supporters"(average of Dimension 2 scores). The t test, for two independent samples, was used to verify significant differences between the dimensions of the questionnaire in the two pediatric care settings.

3. RESULTS

Participated in the study 300 responsible by the feeding of the child who were waiting for care in the waiting room of the Pediatric Clinic of the Polyclinic Piquet Carneiro / UERJ (n=150) and the health plan operator (SJM) in the municipality of São João de Meriti (n=150).

The average age of those responsible for feeding the child was 38.6 years (SD=2.20; min=18 and max=66) for the pediatric outpatient clinic of SJM, with 87.33% being female and 12.67% of the masculine. At the PPC/UERJ outpatient clinic, the mean age was 46.84 years (SD=14.12; min=20 and max =78), 84% female and 16% male. The Middle and High School Education was predominant in both research sites.

The result of the Doornik-Hansen test confirmed the multivariate normality of the scores attributed

to the questionnaire items for both the SJM sample (chi^2 (22)=602.969 Prob chi^2=0.0000) and for PPC/UERJ (chi^2(22)=411.666 Prob chi^2=0.0000. The KMO test obtained at the SJM outpatient clinic ranged from 0.78 to 0.92 and, at PPC/UERJ, from 0.76 to 0.92, with the samples considered adequate for the reliability study (data not shown in table).

Cronbach's alpha for both dimensions in the two outpatient clinics, SJM and PPC/UERJ, reached values above α=0.75, both for the point estimate and for the lower limit of the confidence interval (95%CI), being considered satisfactory. These results corroborate the internal consistency of the

items in the respective dimensions (Tables 2 and 3).

The index of measurement error was 0.33 and 0.28 (error variance) for SJM and PPC/UER, respectively.

The weighted Kappa coefficient reached 0.90 (*p value* α=.0008) (data not shown in the table), indicating "almost perfect" agreement between SJM and PPC/UERJ.

The t test for two independent samples showed a significant difference for Dimension 1 (Table 2), but not for Dimension 2 (Table 3).

Table 2. Mean scores, Cronbach's alpha and t-test for Dimension 1 of the "Questionnaire to assess the adoption of *in natura* vegetable oil in addition to children's diets", applied in the pediatric outpatient clinics SJM, municipality of São João de Meriti, and PPC / UERJ, municipality of Rio de Janeiro - period from March 2017 to January 2019

Items	Dimension 1	Average (CI95%)	
		SJM	PPC/UERJ
i4-P	Putting raw vegetable oil in the child's food improves the situation of the underweight child.	2.30 (2.20-2.40)	2.59 (2.46-2.72)
i6-P	Using raw vegetable oil in the child's food improves the child's immunity.	2.34 (2.23-2.44)	2.56 (2.43-2.69)
i7-P	If I add raw vegetable oil to the child's food, he will not be overweight.	2.40 (2.29-2.50)	2.58 (2.45-2.71)
i9-P	It is good for the child to put raw vegetable oil in the bottle.	2.04 (1.98-2.11)	2.17 (2.09-2.25)
i10-P	Using raw vegetable oil in children's food improves their resistance to transmissible diseases	2.31 (2.21-2.40)	2.56 (2.43-2.68)
i13-P	Adding raw vegetable oil does not raise the child's cholesterol	2.46 (2.34-2.59)	2.66 (2.51-2.80)
i15-P	The right thing is not to sauté the child's food and put the raw vegetable oil after the ready salted porridge.	2.22 (2.12-2.32)	2.55 (2.42-2.68)
Overall average dimension CI95% SD VC%		2.30 (2.19-2.40) 0.64 27.70	2.53 (2.40-2.65) 0.78 30.80
Mean difference *t* test		Difference -0.23 (CI 95%: -0.39 to -0.06)	
		p value: .0028[*]	
Cronbach's alpha		0,82	0,85
		IC95% (0.76-0,88)	(0.80-0.89)

SJM: São João Meriti, PPC/UERJ: Policlinic Piquet Carneiro University of State Rio de Janeiro.
Dimension 1:"Benefits of adding in natura vegetable oils to the children's diet", I: Item, P: positive sense item,
SD: standard deviation, CV: coefficient of variation, CI95%: Confidence Interval 95% significance

Table 3. Mean scores, Cronbach's alpha and t-test for Dimension 2 of the "Questionnaire to assess the adoption of *in natura* vegetable oil in addition to children's diets", applied in the pediatric outpatient clinics SJM, municipality of São João de Meriti, and PPC/UERJ, municipality of Rio de Janeiro - period from March 2017 to January 2019

Item	Dimension 2	Average (CI95%)	
		SJM	PPC
i1-N	Putting raw vegetable oil in the child's food worsens the situation of the underweight child.	3.42 (3.28-3.55)	3.21 (3.08-3.34)
i3-N	Putting raw vegetable oil in the child's food causes nausea.	3.62 (3.50-3.73)	3.50 (3.38-3.61)
i8-N	Putting raw vegetable oil in the child's food causes vomiting.	3.58 (3.46-3.70)	3.53 (3.41-3.64)
i14-N	The use of raw vegetable oil every day causes diarrhea.	3.62 (3.50-3.74)	3.52 (3.40-3.64)
Overall average dimension CI95% SD CV%		3.56 (3.43-3.68) 0.77 21.50	3.44 (3.31-3.56) 0.77 22.27
Mean difference *t* test		Difference 0,12 (IC 95%: -0.05 a -0.29) *p valor*: 0.08	
Cronbach's alpha		0.90	0.85
		CI95% (0.86-0.95)	(0.79-0..90)

SJM: São João Meriti, PPC/UERJ: Policlinic Piquet Carneiro- University of State Rio de Janeiro. Dimension 2:"Possible problems related to adding in nature vegetable oils to the children's diet", I: Item, P: negative sense item, SD: standard deviation, CV: coefficient of variation, CI95%: Confidence Interval 95% significance

In the pediatric outpatient clinic of SJM, the mean scores for each item in Dimension 1 ranged from 2.04 to 2.46. When considering the overall average of the dimension, the value was 2.30 (95% CI 2.19-2.40). The variability (CV%=27.70) was relatively high. At the PPC/UERJ outpatient clinic, the average for each item ranged from 2.17 to 2.66 and the overall average for Dimension, 2.53 (95% CI 2.40-2.65). The variability (CV%=30.80) was also relatively high (Table 2).

In relation to Dimension 2, similarly, in the SJM pediatric outpatient clinic, the mean scores for each item ranged from 3.42 to 3.62, with an overall average of 3.56 (95% CI 3.43-3.68). The variability was low (CV%=21.50). At the PPC/UERJ outpatient clinic, the average for each item ranged from 3.21 to 3.53 and the overall average for the dimension reached 3.44 (95% CI 3.31-3.56). Similarly to SJM, the variability was low (CV%=22.27) (Table 3).

4. DISCUSSION

Currently, the development and use of instruments to assess attitudes towards the adoption of certain health guidelines is observed. However, although the recommendation to use added vegetable oil in children's diet dates from 2013 [14], there was no investment in creating an instrument that would check whether those responsible for feeding children would be able to adopt it. Instruments to be applied to the population need to go through an adaptation process, taking into account the context for whom and where they are destined, using a judicious process of validation and reliability. The aim is to make it suitable and comprehensible to the interest group to which it will be applied.

It is believed that each new initiative in the use of a questionnaire constitutes a new opportunity to evaluate and improve it. In fact, it is not possible to guarantee its stability, that is, it cannot be guaranteed that possible contextual differences do not affect its psychometric properties. This is the reason for replicating an instrument. Not replicating a research questionnaire, in search of its stability is a limitation for its use, since it was designed for behavioral measurement.

Reliability is one of the most important criteria for evaluating instruments and can be inferred by

calculating Cronbach's alpha. Cronbach's alpha of the original version was 0.84 [16]. Kline [27] states that the cut-off point for Cronbach's alpha value is 0.70, which allows inferring about adequate values for the internal consistency of the items in both dimensions (SJM/D1=0.82; PCC/D1= 0.85; SJM/D2=0.90; PCC/D2=0.85). In the present study, values greater than 0.80 were found, which reflects a high degree of conceptual equivalence between the original questionnaire [16] and when applied in two municipal health units, with similar subjects.

Streiner [23] comments that in the 1960s, psychometrist Nunnally initially recommended Cronbch's alpha between 0.50 to 0.60 for the initial research stages, 0.80 for basic research tools and 0.90 as a tolerable estimate for studies clinical trials, with an ideal value of 0.95. In the 90s he increased the initial level to 0.70, values that are currently serving as a reference. It necessaries remember that Streiner [23] points out that he cannot admit values of alpha above 0.90. Validation studies of cognitive and behavioral measurement instruments have declared values above 0.70 as an adequate alpha. Garnefski and Kraaij [28] showed Cronbach's alpha above 0.75 for the nine subscales of the "Cognitive Emotion Regulation Questionnaire (CERQ) for adults with symptoms of depression and anxiety. Aragão et al. [29] used the "Beck Depression Inventory", a one-dimensional scale, to determine the rate of occurrence of depressive symptoms among nurses working at family healthcare units in the municipality of Aracaju. This scale was validated by Gomes-Oliveira et al. [30] for Portuguese-speaking interest groups reaching Cronbach's alpha value of 0.93. In the present study, the questionnaire reached alpha values of 0.82 and 0.85 in Dimension 1 and, 0.90 and 0.85 in Dimension 2, for SJM and PCC / UERJ respectively, both consonant with the recommendation of Streiner [23]. It should also be noted that the scale that may have excellent reliability with one group may have only marginal reliability in another. One implication of this is that it is not sufficient to rely on published reports of reliability if the scale is to be used with another group of people [23].

The reproducibility of the instrument was demonstrated using the weighted Kappa (kapwg=0.90; *P value*=0.0008), with sample adequacy (SJM and PCC/UERJ: KMO>0.70) demonstrating their viability for the validation of the construct "Adoption of *in natura* vegetable oil in addition to children's diet".

Among the items on the scale, regardless of the distinction between outpatient clinics, the scenario for Dimension 1 ("Benefits of adding *in natura* vegetable oils to children's diets") suggests that respondents do not recognize the benefits of adding oil (overall average SJM=2.30; PPC=2.53), since scores 4 and 5 would point to greater knowledge and, consequently, adoption of dietary practice.

Few studies have used weighted Kappa in replicability studies. In the present study, the weighted Kappa reached an expressive value (0.90). Garnefski and Kraaij [28] used Pearson's correlation coefficient and found values ranging from 0.48 to 0.65 in the subscales of the "Cognitive Emotion Regulation Questinnaire". Gomes-Oliveira et al. [30], used the intra class coefficient for test-retest of the "Beck Depression Inventory" whose value was 0.89.

The advantage of using the weighted Kappa statistic for variables in scale ordinal (Likert scale) is that it allows you to assign different weights to the concordances and disagreements [31].

Analyzing semantically it can be inferred that the lowest level of credibility in adopting the use of *in natura* vegetable oil was represented by item i9-P ("It is good for the child to put raw vegetable oil in the bottle") with a mean=2.04 (Tables 2 and 3).

Garnefski and Kraaij [28] advert that although the capability to think about things to the future of and regulating emotions through cognitions have a universal character, but large individual differences exist in the amount of cognitive activity. Then thinking and acting refer to different processes. So it is possible to believe that those responsible for feeding the child would refuse to put vegetable oil in the child's bottle, however they use infant formulas with the addition of vegetable oil. Health professionals, when knowing what these caregivers of children think, can make them positively reevaluate a dietary strategy.

Regard to possible problems with such dietary practice, it is possible to state that these respondents tend to have doubts (global average SJM=3.56; PPC=3.44). However, it cannot be said that they would not be able to adopt such a

practice. None of the statements obtained an average equal to or greater than 4 (4-agree or 5-very agree), so those health professionals can direct their efforts to help the child caregivers in order to adopt the use of *in natura* vegetable oil in diet of underweight children (Tables 2 and 3).

A limitation of the study was that the detection of the adoption of dietary practice was done by interview face to face. This may have caused some bias. Future studies could be carried out by self-report.

A strong point of the present study was the prospective character, in which the questionnaire indicates whether the recommendation to use *in natura* vegetable oil in addition to the diet can cause problems in the dietary prescription.

5. CONCLUSION

The results of the study showed, as evidence of reproducibility, satisfactory internal consistency of the items in Dimensions 1 and 2 and consequently, reliability by replicability of the questionnaire.

The proposed questionnaire can be considered a viable alternative to assess the adhesion or not of those responsible for child feeding regarding the use of *in nature* vegetable oil as a dietary strategy to increase the energy density of the diet for children with energy protein malnutrition.

CONSENT

All Participants signed the Free and written Informed Consent Form and preserved to carry out the study.

ETHICAL APPROVAL

This study is part of the Project "Edible Vegetable Oil in the Diet as a Strategy for Increasing Energy Density", submitted to the Research Ethics Committee of the University of the State of Rio de Janeiro (RJ) in compliance with Resolution no. 466/12 of the National Health Council / Ministry of Health, having been approved through opinion no. 006.3.2008.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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