Transcultural adaptation and validation of the instrument Parental Health Literacy Activities Test (PHLAT)

Adaptação transcultural e validação do instrumento Parental Health Literacy Activities Test (PHLAT)

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ABSTRACT The purpose of the study was to perform the translation, cultural adaptation and psychometric validation of the instrument Parental Health Literacy Activities Test (PHLAT), which assesses health literacy for caregivers/family members seeking care for their children under one year old in the primary care unit. Methodological, quantitative, validation and cross-cultural instrument adaptation study, following the steps of translation, back-translation, judges committee analysis, application of statistical tests to evaluate psychometric properties, obtaining its version for Brazilian Portuguese. The pre-test was performed with 31 family members and test/retest with 93, in primary care units in the municipality of Western Paraná, in 2018 and 2019. Inferential statistical analysis was applied to verify the validity and reliability of the instrument. On the content validity of the judges committee, a 100% agreement rate was obtained. The data in the pretest phase presented Cronbach's alpha coefficient of 0.73, and the test/retest of 0.69. The reliability assessment by the intraclass correlation coefficient was 0.865, considered substantial. The instrument was considered adequate for its cultural adaptation and validated for Brazilian Portuguese, reliable for application between caregivers/family members.

KEYWORDS Validation studies. Child. Caregivers. Health. Literacy.

RESUMO *O objetivo do estudo foi realizar a tradução, a adaptação cultural e a validação psicométrica do instrumento Parental Health Literacy Activities Test (PHLAT), que avalia o letramento em saúde para cuidadores/familiares que buscam atendimento às suas crianças menores de 1 ano na unidade de atenção primária. Estudo metodológico, quantitativo, de validação e adaptação transcultural de instrumento, seguindo as etapas de tradução, retrotradução, análise por comitê de juízes, aplicação de testes estatísticos para avaliação das propriedades psicométricas, obtendo-se sua versão para o português do Brasil. O pré-teste foi realizado com 31 familiares, e o teste/reteste, com 93, em unidades de atenção primária do município do Oeste do Paraná, em 2018 e 2019. Análise estatística inferencial foi aplicada para verificar a validade e a confiabilidade do instrumento. Na validade de conteúdo com comitê de juízes, obteve-se taxa de concordância de 100%. Os dados na fase de pré-teste apresentaram coeficiente Alfa de Cronbach de 0,73; e na etapa do teste/reteste, obteve-se 0,69. A avaliação da confiabilidade pelo coeficiente de correlação intraclasse foi de 0,865, considerada substancial. O instrumento foi tido como adequado quanto a sua adaptação cultural e validado para o português do Brasil, confiável para a aplicação entre cuidadores/familiares.*

PALAVRAS-CHAVE *Estudos de validação. Criança. Cuidadores. Saúde. Alfabetização.*

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Introduction

Literacy is a result of the process of learning how to read and how to write, it is reached by a subject or a collectivity after the appropriation of writing and of its practices in society. Otherwise, the functional literacy is defined by the knowledge and abilities of reading and writing that allow individuals to be involved in activities that are different from their coverage area[1].

The Functional Health Literacy (FHL), that covers the knowledge, can be described as the stimulus and the individual capacities to access, to assimilate, to analyze and to employ the information in health in order to exert judgments and to make decisions, concerning daily life regarding health, grievances, disease prevention and health promotion[2].

Frequently, the information is expressed in a complex manner, using medical terminology or formal vocabulary that involve comprehension and, therefore, also the care quality[3]. The resulting stress of the diagnosis of a serious illness and the excessive amount of medical information to be followed contribute to the inadequate Health Literacy (HL), as well as to the triggering of negative clinical outcomes[4]. In this study, the two concepts of HL and FHL were considered synonyms.

Thus, HL, due to its complexity, multidimensionality, interdisciplinarity[5,6] and to the impact that an inadequate literacy may cause on individuals, family, community and on the health system, has raised interest in the theme by researchers, health professionals and public policies formulators[7].

In a study of literature revision on instruments and methods of evaluation of HL, authors[8] have identified 36 instruments of evaluation of HL, being the most used the Test of Functional Health Literacy in Adults (TOFHLA) - devised to evaluate the level of comprehension of patients before the existing communication in the medical area, such as medical prescriptions, instructions for exams of the adult public in general[9] – and The Rapid Estimate of Adult Literature in Medicine (REALM) – instrument of screening developed to be used in ambients of public health and of primary care with the purpose of identifying patients with lower level of reading[10]. It is highlighted the fact that the majority of the researches in validation of instruments, with the purpose of evaluating the HL, are constituted by translations and adaptations of these two instruments[8,11], which occurs also in studies in Brazil. Nevertheless, instruments that can evaluate the HL considering the Brazilian reality are yet limited.

The instrument S-TOFHLA, a reduced version of the TOFHLA[12], had its translation and its validation performed[13], which covers 36 items for reading and 4 items for numerical abilities[12]. The instrument Short Assessment of Health Literacy for Portuguese - Speaking adults (SAHLPA) evaluates the HL of adult individuals, devised based on the translation and adaptation of a Spanish instrument entitled SAHLSA[11]. Culturally adapted and validated in Brazil[14], the instrument for research in health promotion has evaluated the level of HL of undergraduate students of varied courses. Recently, it was validated[15] the Teste de Letramento em Saúde (Health Literacy Test – TLS), instrument of evaluation of the HL for the Portuguese language of Brazil, a result of the process of transcultural adaptation of the TOFHLA.

The Parental Health Literacy Activities Test – PHLAT is a scale that investigates the abilities of literacy in health and numerical comprehension (numbering – terminology used for numerical literacy) of caregivers of babies up to one year of age. The items of the scale test common tasks related to literacy and numbering of care performed by the parents of children under one year of age. That includes mixing the formula of powdered milk, comprehension of the recommendations for breastfeeding, when and how much pediatric medicine to give for cough or cold, for an example, on one´s own, without medical prescription (OTC – Over-The-Counter), as

well as the comprehension of the prescription itself, when a medication is prescribed by a physician, and the understanding of nutritional labels[16].

As a gap in the HL evaluation in the country, were perceived instruments that can measure for the children public in relation to the knowledge of the family about the health care oriented by professionals to the children under medical care. Therefore, this study aimed the translation, cultural adaptation and the psychometric validation of the instrument PHLAT for caregivers/family members of children up to one year of age that seek for health care at the primary attention unit.

Material and methods

This study was approved by the Committee of Ethics in Research with human beings of the State University of West of Paraná, ruled by the resolutions CNS 466/2012 e CNS 510/15, under the opinion n 2.787.988 and CAAE 93750118.0.0000.0107.

For the transcultural adaptation and validation of the instrument PHLAT, which aims to obtain information regarding the level of FLH of caregivers/family members of children, it was obtained previous authorization from the authors of the original instrument.

The test contains 20 questions, distributed in clinical domains, according to the following: nutrition (1-3,12,17-20); psychosocial/development (6); accidents/safety (4,5); and clinics/evaluation/immunization (7-10, 13-16). About the abilities predominantly evaluated, the questions are distributed as follows: printed literacy (1,5,12,13,14,15,19,20); addition and subtraction (2); multiplication and division (3, 17); fractions and decimals (4, 10,16). multiple mathematical functions (8,18); and numbering, calculations, hierarchy and charts (6,7,9,11), For the application of the scale, are demonstrated in each item the charters or images corresponding to the question; and then the answers are registered in the form, using the codification one when the answer is correct and zero when the answer is incorrect.

The validation has followed the recommendations for the transcultural adaptation process of Beaton, Bombardier and Guillemin[17], and the orientations to evaluate the psychometric properties of instruments, regarding reliability and validity, of Souza, Alexandre and Guirardell and Pernambuco er al.[19].

The process of Translation, Cultural Adaptation and Validation (TACV), according to the authors mentioned, has followed the subsequent stages:

a) cultural adaptation: direct translation, synthesis, back translation, consolidation by experts committee and pretest

b) validation: evolution of internal consistence, intraobservational and/or interobservational, apparent or logical validity, of content, criterion and construct.

Translation and cultural adaptation

The first stage covered the translation and the cultural adaptation. The conceptual translation from English to Portuguese was performed by two bilingual independent translators; one of the translators had previous knowledge of the instrument and the other did not have it. Afterward, it was verified the synthesis of the translation by the translators, continuing with the back-translation or reverse translation of the instrument to the original language, by two English language specialists, elaborating the synthesis version of the translated scale.

In order to continue the process of cultural adaptation, it was established a multidisciplinary committee formed by nine specialists, being three professionals in child health (physician specialized in pediatrics, nurse specialized in pediatrics, neonatologist nurse), a methodology professor, two researchers, a linguist and two translators, aiming to analyze the discrepancies and to obtain the version for the field test. In this stage, it was observed the semantic, idiomatic, conceptual and cultural equivalence through the comparison

between the translations and the cultural adaptation, being necessary to adapt items in the Portuguese language, that were not adequate for the Brazilian reality. The adapted instrument has obtained 100% of concordance, being named pre-test version.

Pre-test (applicability/viability)

The scope of the final phase of the cultural adaptation has happened with the application of the pre-test version. This stage of the process pursued to apply the field test of the instrument, with a sample of the population, in order to verify the applicability and viability of the instrument. The pre-test version was applied between October and December of 2018, for validation of the content, in 31 caregivers/family members of children until one year of age in the primary care units of a municipality in the west of Paraná. The sample calculation was based on the number of attendances of children under one year of age in the municipality of the study for all the stages of the research. The filling of the instrument was self - applicable, following the recommendation of the author of the original scale.

At the moment of the filling of each scale, it was made a report about the difficulties found through the observation and those reported by the participants. The questions that had problems, according to the description in the report, were reviewed; the questions were the following: question 3 – interpretation of the analysis of the envelope of the powdered whey, which was substituted by the label of the liquid whey. question 14 – since 14 of the 31 participants of this phase chose more than one alternative of answer for the question, indicating double interpretation. Therefore, the item fever was added of pain, as written in the package of the medication, in the indication of its use, remaining in the option c) fever/pain. The adaptations of the pre-test version were made for the application of the next stage. In this stage, the Cronbach´s alpha coefficient was found for the assessment of the scale.

Test and retest (reliability of the instrument)

In the aftermath, it was performed the investigation of reliability of the scale PHLAT, through the test-retest and the analysis of the internal consistence and of the dimensions found. In this stage, 93 caregivers/family members of children up to one year of age, in the units of primary care, not accompanied by sociodemographic characterization. The applicability of the test-retest occurred between march and June 2019 and aimed to verify the reproducibility of the scale translated and adapted, allowing the visualization of its stability over time.

The applicability of the instrument and its reapplication occurred in an interval of 24 hours to 48 hours, being held with the same participants; however, the test was held in the health care units, while the retest, at home. The questions of the scale had their order modified, avoiding that the answers would influence the recent memory.

The assessment of reliability of the instrument was verified by the Intraclass Correlation Coefficient (CCI), comparing the results of the test and retest, assessing the reproducibility of the scale. The internal consistency of the data was assessed through the application of the Cronbach´s alpha coefficient.

Results

The pretest data indicated Cronbach´s alpha coefficient of 0,73 in a confidence interval of 95%. according to the *table 1*, the version of the pretest being approved for achievement of the next stage, the pretest.

Table 1. Cronbach´s alpha cofficient of questions of the PHLAT, in the pre-test, 2019

Questions	Alpha values	Standardized alpha	G6*	Correlation average interitems	Standard error	Variance	Median
Question 1.1	0.71	0.70	0.90	0.096	0.073	0.038	0.096
Question 2	0.70	0.70	0.90	0.096	0.074	0.039	0.099
Question 2.1	0.72	0.72	0.91	0.104	0.071	0.038	0.100
Question 2.2	0.72	0.72	0.91	0.106	0.070	0.039	0.115
Question 3.1	0.70	0.71	0.91	0.100	0.075	0.040	0.100
Question 3.2	0.71	0.71	0.91	0.101	0.073	0.042	0.095
Question 3.3	0.69	0.70	0.90	0.096	0.078	0.039	0.099
Question 4	0.71	0.71	0.91	0.102	0.072	0.042	0.100
Question 5	0.72	0.72	0.92	0.105	0.070	0.043	0.100
Question 6	0.72	0.72	0.91	0.104	0.070	0.043	0.101
Question 7	0.74	0.74	0.91	0.113	0.065	0.041	0.114
Question 8	0.72	0.71	0.91	0.102	0.070	0.041	0.099
Question 9	0.73	0.74	0.92	0.113	0.067	0.042	0.116
Question 10	0.72	0.72	0.91	0.105	0.071	0.040	0.100
Question 11	0.69	0.70	0.90	0.097	0.078	0.040	0.096
Question 12	0.73	0.73	0.92	0.110	0.068	0.043	0.115
Question 13	0.73	0.73	0.92	0.111	0.067	0.041	0.101
Question 14	0.73	0.74	0.92	0.115	0.068	0.042	0.115
Question 15	0.73	0.73	0.92	0.112	0.067	0.042	0.115
Question 16	0.73	0.74	0.92	0.115	0.067	0.040	0.115
Question 18	0.75	0.74	0.91	0.115	0.063	0.040	0.115
Question 19	0.71	0.70	0.90	0.095	0.071	0.039	0.099
Question 20	0.71	0.71	0.92	0.101	0.071	0.042	0.099

Source: Own elaboration.

*G6 – Guttmans Lambda 6 reliability test.

In *table 2*, it is presented the percent of right answers according to each question.

Table 2. Presentation of the index of correct and incorrect answers of each question of the PHLAT, in the pre-test, 2019

	Answers	
Questions	**Incorrect**	**Correct**
1 Using the instructions available at the package of the powdered milk 1, how much water and how much of milk powder shall you use to make 120 ml of milk?		
1.1 Quantity of water used:	13%	87%
1.2 Number of measures used:	16%	84%
2 Using the instructions available at the package of the powdered milk 1, how much water and how much of milk powder shall you use to make 210 ml of milk?		
2.1 Quantity of water used:	19%	81%
2.2 Number of measures used:	10%	90%

Table 2. (cont.)

Questions	Answers	
	Incorrect	Correct
3 Your baby has diarrhea, and the pediatrician recommends that you give a 240 ml bottle, mixing half of milk and half of oral rehydration whey. How would you prepare that bottle with the powdered milk1?		
3.1 Quantity of water used:	48%	52%
3.2 Number of measures used:	32%	68%
3.3 Quantity of whey used:	45%	55%
4 You are informed by your baby´s pediatrician to take him/her to the health care service if he or she has a temperature of 38°C or higher. The thermometer marks the following temperature: 37,8°C.		
Should you take your child for evaluation at the health care service?	48%	52%
5 Let´s say your 10 months child weights 10.400 grams and normal height for the age. Using the chart about the use of child seats, which car seat shall you choose for your child?		
a) Baby-comfort, turned back, in the back seat	23%	77%
b) Baby-comfort, turned to the front, in the back seat	0%	0%
c) Safety chair, turned back, in the back seat	0%	0%
d) Safety chair, turned to the front, in the back seat	0%	0%
6 At the follow-up visit of your baby´s 2 months, the doctor says that, according to the curve of child growth, he or she is at the percentile 25 of weight. What does this percentile mean? Please, look at the curve of growht shown.	32%	68%
7 If your 7 months baby weighs 8 kilos and is ill with fever, how much fever medicine shall you give him or her? Using the Table of Dosage of the medicine shown, indicate the quantity of drops of the medicine that types of child medicine for fever shown, which one of them you would need to use less drops, to treat your baby´s fever?you may give to your child. Decide the dose based on his/her weight.	19 %	81%
8 Examining the leaflets of two types of child medicine for fever , of which one of them you would need to use less drops, to treat your baby´s fever?		
a) Ibuprofen 50mg	0%	0%
b) Ibuprofen 100mg	6%	94%
9 If your 3 months baby weighs 5 kilos , is ill of fever and you buy the medicine for fever,in drops. Using the box as a reference, would you give the medicine to your baby?		
( ) Yes	94%	6%
( ) I would call the pediatrician or would take him/her to the health care service	0%	0%
( ) No	0%	0%
10 If you are using child medicine to treat your child´s fever, and your doctor recommends that you only give ½ teaspoon of the medicine, how many milliliters (ml) you need to give? You may consult the chart.	52%	48%
11 Your 3 year old and 16 kilos nephew comes to visit you and, suddenly, he is ill of fever. To treat him, you decide to give him what is recommended in the chils´s medicine for fever of 2,5ml leaflet. How much should you give him?		
a) ½ teaspoon	58%	42%
b) 1 teaspoon	0%	0%
c) 1 ½ teaspoon	0%	0%
d) 1 tablespoon	0%	0%

Table 2. (cont.)

Questions	Answers	
	Incorrect	Correct
12 Your doctor gives you the following list of food to avoid giving to your baby:		
– Milk **– Peanuts, chestnuts, walnuts** **– Egg whites** **– Fish and seafood** **– Grape** **– Raw carrot** **– Popcorn** **– Hot-dog**		
After reading the list of ingredients of the biscuit given, would you give it to your 10 months baby?		
( ) Yes	0%	0%
( ) No	26%	74%
13 At 6 months of age, your baby has a higher chance to get a cold and other infections. Taking as an example the paracetamol in drops given, decide if you would use this medication for your child and how much would you give.		
( ) Yes – I would _____(write the quantity)	0%	0%
( ) Yes – I would, but Iwould ask the pediatrician first	39%	61%
( ) No – I would not give my child the medicine	0%	0%
14 According to the information at the box of the medication given, which symptons this medication DOES NOT help to relieve.		
a) Nasal congestion	0%	0%
b) Vomit	0%	0%
c) Fever	3%	97%
d) Cough	0%	0%
15 Your baby is one year old, weighs 8 kilos and is ill of cold and fever.You give him or her the quantity of drops of paracetamol that you always use, however, an hour later, he or she is still with fever. You also have a bottle of dipyrone. What should you do, give the other medicine or wait?		
a) Give ____ml/drops of dipyrone	0%	0%
b)Wait, because_____	16%	84%
16 Your baby has an ear infection, and the doctor prescribes amoxicillim 3 times a day (see bottle). Using the syringe/glass, demonstrate how you would administrate the prescribed dose of 5 ml.	6%	94%
17 A nutricionist tells you to give your baby, more than 6 months old, no more than 50 ml of juice each time. 200 ml of juice will be enough for how many times?	0%	100%
18 Processed sweetened drinks contain high quantity of sugar and low level of nutrients important to the maintenance of health. Natural juice with a 100% of fruit or vegetables shall be preferred. The processed juice must specify on the label the amount of sugar, vitamins, proteins, sodiom and another components it contains. Based on this information, analyze the label with the Nutritional Data, of the juice offered, and decide if you would give it to your child?		
( ) Yes	0%	0%
( ) No	42%	58%
19 In the first 3 days of breastfeeding, the breast gets swollen and painful. According to this leaflet, how long will it take to get better?	3%	97%

Table 2. (cont.)

Questions	Answers	
	Incorrect	Correct
20 You are not sure if your baby is getting enough milk, since it takes around 15 minutes to feed in both breasts. According to this leaflet, this is:		
a) normal	10%	90%
b) more than the normal	0%	0%
c) less than the normal	0%	0%

Source: Own elaboration.

In the pretest, the questions that had the percent of right answers around or below 50% were questions 3.1, 3.3, 18, referring to the nutrition domain, question 4, about safety, questions 9, 10 and 11 of the medicines domain. About the abilities required in each one of them, there was difficulty of numerical interpretation, referring to multiplication and division in question 3, fraction and decimals, in questions 4 and 10, multiple mathematical capabilities in question 18, numerical hierarchy in answers 9 and 11. For the question about juice offering to the child (question 17), the result obtained was 100%. In this case, this question was excluded for the calculation of correlation and reliability.

The assessment of reliability of the instrument in the test-retest was verified by the CCI, comparing the results of test and retest, allowing the assessment of the reproducibility of the scale. The internal consistency of the data was assessed through the application of the Cronbach´s alpha coefficient (*table 3*), whose question 14 obtained 100% of right answers and, as a result, was excluded of the calculation, but not of the scale.

Table 3. Cronbach´s alpha cofficient of the questions of the PHLAT, in the test/retest, 2019

Questions	Alpha values	Standirdized alpha	G6*	Average correlaction interitems	Standard error	Variance	Mediane
Question1.1	0.66	0.67	0.75	0.083	0.050	0.018	0.066
Question 1.2	0.66	0.67	0.76	0.086	0.049	0.019	0.073
Question 2.1	0.68	0.70	0.79	0.095	0.046	0.021	0.077
Question 2.2	0.68	0.70	0.79	0.094	0.046	0.022	0.074
Question 3.1	0.66	0.67	0.77	0.086	0.050	0.019	0.070
Question 3.2	0.68	0.69	0.79	0.093	0.047	0.021	0.078
Question 3.3	0.65	0.67	0.77	0.085	0.051	0.018	0.073
Question 4	0.68	0.69	0.79	0.094	0.047	0.022	0.073
Question 5	0.70	0.72	0.81	0.103	0.043	0.021	0.085
Question 6	0.70	0.71	0.80	0.102	0.043	0.021	0.085
Question 7	0.70	0.71	0.80	0.102	0.043	0.021	0.085
Question 8	0.68	0.69	0.79	0.093	0.047	0.021	0.073
Question 9	0.70	0.71	0.80	0.100	0.044	0.021	0.085
Question10	0.66	0.68	0.78	0.088	0.049	0.021	0.066
Question 11	0.66	0.68	0.78	0.089	0.049	0.021	0.070

Table 3. (cont.)

Questions	Alpha values	Standirdized alpha	G6*	Average correlaction interitems	Standard error	Variance	Mediane
Question 12	0.69	0.71	0.80	0.099	0.045	0.021	0.081
Question 13	0.71	0.72	0.80	0.104	0.042	0.020	0.085
Question 15	0.68	0.69	0.79	0.093	0.047	0.022	0.073
Question 16	0.69	0.70	0.80	0.097	0.046	0.022	0.078
Question 17	0.67	0.68	0.77	0.088	0.048	0.020	0.073
Question 18	0.71	0.72	0.80	0.102	0.043	0.021	0.085
Question 19	0.68	0.69	0.78	0.093	0.047	0.020	0.073
Question 20	0.69	0.71	0.80	0.099	0.045	0.021	0.078

Source: Own elaboration.

*G6 – Guttmans Lambda 6 reliability test.

The Cronbach´s alpha coefficient obtained was of 0,69, value considered acceptable. In *table 4*, it is presented the percent of right answers according to each question of the test.

Table 4. Percentage of correct answers according to the questions of the PHLAT, in the test-retest, 2019

	Test Answers		Retest Answers	
Questions	**Incorrect**	**Correct**	**Incorrect**	**Correct**
1 Using the instructions available at the package of the powdered milk 1, how much water and how much of milk powder shall you use to make 120 ml of milk?				
1.1 Quantity of water used:	19%	81%	11%	89%
1.2 Number of measures used:	19%	81%	13%	87%
2 Using the instructions available at the package of the powdered milk 1, how much water and how much of milk powder shall you use to make 210 ml of milk?				
2.1 Quantity of water used:	11%	89%	5%	95%
2.2 Number of measures used:	9%	91%	10%	90%
3 Your baby has diarrhea, and the pediatrician recommends that you give a 240 ml bottle, mixing half of milk and half of oral rehydration whey. How would you prepare that bottle with the powdered milk[1]?				
3.1 Quantity of water used:	32%	68%	27%	73%
3.2 Number of measures used:	51%	49%	48%	52%
3.3 Quantidty of whey used:	34%	66%	28%	72%
4 You are informed by your baby´s pediatrician to take him/her to the health care service if he or she has a temperature of 38°C or higher. The thermometer marks the following temperature: 37,8°C.				
Should you take your child for evaluation at the health care service?	57%	43%	55%	45%
5 Let´s say your 10 months child weights 10.400 grams and normal height for the age. Using the chart about the use of child seats, which car seat shall you choose for your child?				
a) Baby-comfort, turned back, in the back seat	25%	75%	26%	74%
b) Baby-comfort, turned to the front, in the back seat	0%	0%	0%	0%

Table 4. (cont.)

Questions	Test Answers		Retest Answers	
	Incorrect	Correct	Incorrect	Correct
c) Safety chair, turned back, in the back seat	0%	0%	0%	0%
d) Safety chair, turned to the front, in the back seat	0%	0%	0%	0%
6 At the follow-up visit of your baby´s 2 months, the doctor says that, according to the curve of child growth, he or she is at the percentile 25 of weight. What does this percentile mean? Please, look at the curve of growht shown.	38%	62%	33%	67%
7 If your 7 months baby weighs 8 kilos and is ill with fever, how much fever medicine shall you give him or her? Using the Table of Dosage of the medicine shown, indicate the quantity of drops of the medicine that types of child medicine for fever shown, which one of them you would need to use less drops, to treat your baby´s fever? You may give to your child. Decide the dose based on his/her weight.	32 %	68%	40%	60%
8 Examining the leaflets of two types of child medicine for fever, of which one of them you would need to use less drops, to treat your baby´s fever?				
a) Ibuprofen 50mg	0%	0%	0%	0%
b) Ibuprofen 100mg	32%	68%	34%	66%
9 If your 3 months baby weighs 5 kilos, is ill of fever and you buy the medicine for fever, in drops. Using the box as a reference, would you give the medicine to your baby?				
( ) Yes	0%	0%	0%	0%
( ) I would call the pediatrician or would take him/her to the health care service	57%	43%	55%	45%
( ) No	0%	0%	0%	0%
10 If you are using child medicine to treat your child´s fever, and your doctor recommends that you only give ½ teaspoon of the medicine, how many milliliters (ml) you need to give? You may consult the chart.	63%	48%	72%	28%
11 Your 3 year old and 16 kilos nephew comes to visit you and, suddenly, he is ill of fever. To treat him, you decide to give him what is recommended in the chils´s medicine for fever of 2,5ml leaflet. How much should you give him?				
a) ½ teaspoon	61%	39%	58%	42%
b) 1 teaspoon	0%	0%	0%	0%
c) 1 ½ teaspoon	0%	0%	0%	0%
d) 1 tablespoon	0%	0%	0%	0%
12 Your doctor gives you the following list of food to avoid giving to your baby: **– Milk** **– Peanuts, chestnuts, walnuts** **– Egg whites** **– Fish and seafood** **– Grape** **– Raw carrot** **– Popcorn** **– Hot-dog** **After reading the list of ingredients of the biscuit given, would you give it to your 10 months baby?**				
( ) Yes	0%	0%	0%	0%
( ) No	31%	69%	27%	73%

Table 4. (cont.)

Questions	Test Answers		Retest Answers	
	Incorrect	Correct	Incorrect	Correct
13 At 6 months of age, your baby has a higher chance to get a cold and other infections. Taking as an example the paracetamol in drops given, decide if you would use this medication for your child and how much would you give.				
( ) Yes – I would _____(write the quantity)	0%	0%	0%	0%
( ) Yes – I would, but Iwould ask the pediatrician first	40%	60%	42%	58%
( ) No – I would not give my child the medicine	0%	0%	0%	0%
14 According to the information at the box of the medication given, which symptons this medication DOES NOT help to relieve.				
a) Nasal congestion	0%	0%	0%	0%
b) Vomit	0%	0%	0%	0%
c) Fever/pain	0%	100%	0%	100%
d) Cough	0%	0%	0%	0%
15 Your baby is one year old, weighs 8 kilos and is ill of cold and fever. You give him or her the quantity of drops of paracetamol that you always use, however, an hour later, he or she is still with fever. You also have a bottle of dipyrone. What should you do, give the other medicine or wait?				
a) Give ____ml/drops of dipyrone	0%	0%	0%	0%
b) Wait, because _____	24%	76%	27%	73%
16 Your baby has an ear infection, and the doctor prescribes amoxicillim 3 times a day (see bottle). Using the syringe/glass, demonstrate how you would administrate the prescribed dose of 5 ml.				
a) Demonstrated correctly	10%	90%	6%	94%
b) Demonstrated incorrectly	0%	0%	0%	0%
17 A nutricionist tells you to give your baby, more than 6 months old, no more than 50 ml of juice each time. 200 ml of juice will be enough for how many times?	13%	87%	15%	85%
18 Processed sweetened drinks contain high quantity of sugar and low level of nutrients important to the maintenance of health. Natural juice with a 100% of fruit or vegetables shall be preferred. The processed juice must specify on the label the amount of sugar, vitamins, proteins, sodiom and another components it contains. Based on this information, analyze the label with the Nutritional Data, of the juice offered, and decide if you would give it to your child?				
( ) Yes	0%	0%	0%	0%
( ) No	46%	54%	42%	58%
19 In the first 3 days of breastfeeding, the breast gets swollen and painful. According to this leaflet, how long will it take to get better?	18%	82%	16%	84%
20 You are not sure if your baby is getting enough milk, since it takes around 15 minutes to feed in both breasts. According to this leaflet, this is:				
a) normal	12%	88%	13%	87%
b) more than the normal	0%	0%	0%	0%
c)I less than the normal	0%	0%	0%	0%

Source: Own elaboration.

In the test, the questions that had the percent of right answers below 50%, referring to the nutrition domain, were questions 3.2, 4 (in the pretest 48% and in the test 43%); about safety, question 9 (in the pretest 6%, in the test 43%), in the medicament domain, question 10 (pretest 48% and in the test 37%) and question 11 (in the pretest 42%, in the test 39%). About the abilities required in each one of them, that was little capacity of numerical interpretation, referring to multiplication and division in question 3, fraction and decimals in questions 4 and 10, numerical hierarchy in answers 9 and 11. For the question about the symptoms that this medication DOES NOT help to relieve (question 14), it was obtained 100% of right answers.

The alpha data of each question are presented in *table 5*, that follows.

Table 5. Comparison of the Cronbach´s alpha between the pre-test and the test, 2019

Question	Alpha pre-test	Alpha test
Question 1.1	0.71	0.66
Question2	0.70	0.66
Question 2.1	0.72	0.68
Question 2.2	0.72	0.68
Question 3.1	0.70	0.66
Question 3.2	0.71	0.68
Question 3.3	0.69	0.65
Question 4	0.71	0.68
Question5	0.72	0.70
Question 6	0.72	0.70
Question 7	0.74	0.70
Question 8	0.72	0.68
Question 9	0.73	0.70
Question 10	0.72	0.66
Question 11	0.69	0.66
Question 12	0.73	0.69
Question 13	0.73	0.72
Question 14	0.73	-
Question 15	0.73	0.68
Question 16	0.73	0.69
Question 17	-	0.67
Question 18	0.75	0.71
Question 19	0.71	0.68
Question 20	0.71	0.69

Source: Own elaboration.

The assessment of reliability of the instrument analyzed by the CCI was of 0.865 with confidence interval of 95%.

Discussion

About the data of the validation to Portuguese of the instrument PHLAT, in the pre-test and also in the test and in the retest, it became evident that the questions obtained Cronbach´s alpha coefficient of 0,73 and 0,69, respectively, considered substantial[21] and comparable to the reliability of the original instrument, that was assessed using the tests of internal consistency with the Kuder-Richardson presenting the value of KR-20 equal to 0,76[16].

The difficulties and limitations are inherent to the adaptation and to the validation of an instrument from another country of origin, because the target country has significant cultural and language differences, rendering modifications inevitable[15], being necessary to adapt items in Portuguese, that were not adequate for the Brazilian reality. Nevertheless, the uniqueness of the original instrument, certified by the back-translation, even though there were generated semantic or conceptual differences comparing the original scale and the synthesis version obtained[19], to suit the Brazilian public.

Another limitation of the study is the lack of instruments to measure the FHL of parents/caregivers of children, since studies about the theme are yet limited in the international scenario and in Brazil. That fact becomes relevant in as much as children group is assiduous public in primary attention, mainly seeking for care for respiratory diseases, that affect children prevalently in the country and influence in the hospitalization by avoidable causes by the primary care[22].

The data highlighted by this study give rise to concern (*table 4*); they reveal that: 43% of the caregivers were able to interpret a thermometer in order to decide if the temperature indicated would be a reason to take or not his/her child to the pediatrician; 68% could interpreter, after the provision of dosage/weight, the correct quantity of administration of a medication, 57% would buy and administrate a medication to their child without a pediatrician´s indication, 62% knew how to interpret if the percentile in the growth curve given was adequate for the weight/age; 63% and 61% (questions 10 and 11) could not interpret and transform milliliters (ml) in spoon measures to administrate the medication, 54% pointed that they would give processed juice to their children.

Yet, the percentile of caregivers that could prepare a bottle of 240 ml fractioned with oral rehydration whey was of 61% (*table 4* - Test). A large part of the caregivers interviewed (88%), after reading the leaflet of breastfeeding, answered that the time interval between the feedings demonstrated was normal for breastfeeding. In comparison to the original study[1], 69% were capable of reading correctly a thermometer to determine if they would call the pediatrician or not; 53% were able to determine the adequate dose of the medicine in drops. Only 64% were able to determine correctly if they would give processed juice, 51% were able to interpret the percentile of a growth curve. Few participants (18%), after reading a guide about breastfeeding, were able to determine how much the time spent in the feeding was shorter than normal, similar to a study about the theme.

The PHLAT results point countless challenges that caregivers face while trying to provide appropriate daily care, related to child health. It highlights that caregivers, frequently, are unable to understand nutrition and medication labels, simple leaflets of child health and basic recommendations about child care. Many also could not mix infant formulas or medication adequately[16].

Study with teenage mothers[23], that can be however extended to the general population, has demonstrated the importance of children health literacy in its various specialties, regarding communication about health and

vulnerability, that require clear, precise and accessible information about health to promote their own health and the baby´s health, justifying, therefore, the option for the adaptation and validation of that scale for this public, that did not have a FHL measurement instrument adequate to the Brazilian reality.

Conclusions

The PLHAT Brazilian version presented itself as a reliable instrument to measure the FHL of the caregiver related to the therapeutics indication of the health professional to their child, allowing to assess the relation between the HL and the families users of the Brazilian Health Care System (SUS) at the moment of their children attendance at the primary care unit. Its importance resides in the fact that, if the family member caregiver does not understand the therapeutics proposed, he or she may not implement it or do it partially, leading to the deteriorating of the heath picture of the child and, consequently, to the hospitalization caused by conditions that could possibly be solved in the ambit of primary health care.

O PHLAT Brazilian version demonstrates great relevance in the everyday use of the primary care, since it can be applied to identify of the vulnerability of comprehension and communication that affect children and their families that need more and better information in the context of child care. The findings of this study indicate the importance of the clear communication in health, focused on the basic abilities needed for child health care, as well as directing of health professionals to improve the communication with caregivers, including interactive materials of education and health of easy comprehension.

It was perceived the necessity to improve the comprehension of information about child health, making an effort that aim to improve the health care, investing in more time for medical consultation and in sharing professional knowledge during the consultations, including in consultations with nurses, whose potential in health education has great relevance in this care process.

Collaborators

Simch FBL (0000-0002-4722-4891)* and Toso BRGO (0000-0001-7366-077X)* have contributed for the conception of the project, conduction of the study, data collection, data analysis, writing and final approval of the manuscript. Vieira CS (0000-0002-0900-4660)* has contributed to the conduct of the study, data collection, data analysis, writing and final approval of the manuscript. Santos MB (0000-0001-8826-8930)* has contributed for the data analysis, writing and final approval of the manuscript. ■

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