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Predictor scale for adherence to diet therapy in chronic non-communicable diseases (PSADT-CNCD): Development and validation

Escala preditora de adesão à dietoterapia em doenças crônicas não transmissíveis (EPAD-DCNT): desenvolvimento e validação

Abstract

Introduction: Chronic non-communicable diseases are highly prevalent and relevant in Public Health. Diet therapy is essential to the overall therapeutic approach to these diseases. However, there is low adherence in the medium and long term, and it is necessary to develop and validate instruments to verify adherence to diet therapy guidelines. *Objective*: To develop and validate a scale for early verification of the behavior of people with chronic non-communicable diseases regarding adherence to the recommended diet therapy, the Predictor Scale of Adherence to Diet Therapy in Chronic Non-Communicable Diseases (PSADT-CNCD). *Methods*: This is an original article on the development and validation of ascale consisting of eight questions, each with five possible answers, based on a *Likert-type* scale, and the extreme values represent the best and worst adherence. The validation of the theoretical stage comprised content analysis by eight judges specialized in the construct field and a pilot application on subjects from the target population for semantic analysis. *Results*: The scale showed high reliability and validity (Cronbach's α= 0.731; McDonald's omega = 0.73; correlation matrix determinant of 0.235, KMO of 0.744, and significant Bartlett's sphericity test, with p<0.001) for predicting low adherence behaviors. *Conclusions*: The scale wasviable for use as a quick and simplified screening tool to identify behaviors that tend towards low adherence to the diet therapy recommended for patients with NCDs, particularly SAH and DM2, allowing for improved dietary guidance actions for this group.

Keywords: Cooperation and Adherence to Treatment. Diabetes. Hypertension. Diet therapy. Validation Study.

Resumo

Introdução: As doenças crônicas não transmissíveis têm alta prevalência e importância em saúde pública. A terapêutica dietética é um componente importante da abordagem terapêutica global destas doenças. No entanto, há baixa adesão no médio e longo prazo, e se faz necessário desenvolver e validar instrumentos voltados para verificar a adesão às orientações dietoterápicas. *Objetivo*: Desenvolver e validar uma escala para verificar precocemente comportamento de pessoas com doenças crônicas não transmissíveis para adesão à terapia dietética recomendada, a Escala Preditora de Adesão à Dietoterapia em Doenças Crônicas Não Transmissíveis (EPAD-DCNT). *Métodos*: Trata-se de um artigo original, de desenvolvimento e validação de uma escala, composta por oito questões, cada uma com cinco possibilidades de respostas, baseadas em escala do tipo *Likert*, com os extremos significando a melhor

e a pior adesão. A validação da etapa teórica compreendeu a análise de conteúdo por oito juízes especialistas na área do constructo e uma aplicação piloto em sujeitos da população-alvo para análise semântica. ***Resultados***: A escala apresentou alta confiabilidade e validade (coeficiente α de Cronbach de 0,731; ômega de McDonalds = 0,73; determinante da matriz de correlação de 0,235, KMO de 0,744 e o teste de esfericidade de Bartlett significante, com $p < 0,001$) para prever comportamentos de baixa adesão. ***Conclusões***: A escala demonstrou ser viável para utilização como uma ferramenta de triagem rápida e simplificada para identificar comportamentos que tendem à baixa adesão à terapia dietética recomendada para portadores de DCNT, particularmente HAS e DM2, permitindo aprimorar as ações de orientação dietética para esse grupo.

Palavras-chave: Cooperação e Adesão ao Tratamento. Diabetes. Hipertensão. Dietoterapia. Estudo de Validação.

INTRODUCTION

Chronic non-communicable diseases (NCDs) can be defined as diseases that generally occur in youth and remain dormant for years, manifesting themselves at older ages. NCDs can worsen constantly or in alternating stages. Symptoms are long-lasting and can deteriorate over time.[1] The primary chronic non-communicable diseases are cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes. They all share several modifiable risk factors, one of which isinadequate eating habits.[2] NCDs are responsible for seven out of the 10 leading causes of death worldwide, primarily cardiovascular diseases, mainly systemic arterial hypertension (SAH) and diabetes (DM),[3] where type 2 DM (DM2) accounts for 90% of diagnosed cases.[4]

Non-pharmacological therapy is an essential component of the overall therapeutic approach to hypertension and DM2, mainly regarding diet. Glycemic control in patients with DM2 and keeping blood pressure levels within acceptable values for hypertensive individuals are strongly linked to following nutritional guidelines. However, we observe hypertensive and diabetic patients'low adherence to nutritional recommendations in the medium and long term.[4-6]

Discussions about the importance of treatment adherence go back a long way. In 2003, the World Health Organization warned that a treatment is more likely to be followed when discussing adherence.

Determining the patient's readiness for behavioral change enhances adherence to therapy.[5] However, health professionals'excessive demand in PHC units does not allow them to investigate the patients' difficulties in following the prescribed therapy in depth.[6] Therefore, there is a need for simple tools that fit in with clinical care realities and help professionals get closer to patients in order to detect groups of patients with potentially low adherence to therapeutic recommendations early on.[7] Some instruments for this purpose are already available, but they focus on pharmacological therapy, underscoring the need for studies that seek to develop and validate instruments to verify adherence to nutritional prescriptions.[8]

Thus, this study aimed to develop and seek evidence of content validity for a scale that verifies the tendency of NCD patients to follow (or not)the recommended diet therapy, particularly among SAH and DM2 patients, as they are more prevalentper health bodies' publications.

METHODS

This methodological study was conducted to develop and validate a scale that predicts adherence to diet therapy in chronic diseases. The steps followed were adapted from Kyriazos & Stalikas.[9]

Theoretical stage

In the theoretical stage of developing this scale, we looked for theoretical references to support the construction of an instrument with the intended focus. As a result, we defined search descriptors per those available in the Health Sciences Descriptors (DeCS) of the Regional Library of Medicine (BIREME):"*diet*", "*adherence*, "*diet therapy*", and "*chronic diseases*". The descriptors employed were*"diet AND adherence"; "diet therapy AND adherence; diet AND adherence AND chronic diseases"*; and*"diet therapy AND adherence AND chronic diseases"*. The search was performed in the Science Direct, Medline/PubMed, and SciELO virtual library databases. We considered literature reviews and studies related to assessing adherence in adults with chronic diseases.

The closest study to this proposal was conducted by Buszko et al.[7] to develop and validate the Adherence in Chronic Diseases Scale (ACDS), albeit with a focus on medicine therapy. Thus, we contacted and subsequently sealed a partnership

with these authors linked to Nicolaus Copernicus University. Then, we elaborated the*Predictor Scale for Adherence to Diet Therapy in Chronic Non-Communicable Diseases (PSADT-CNCD)*simultaneously in Fortaleza, Brazil, and Torun, Poland.

The PSADT-CNCD consisted of 10 questions, each with five possible answers, based on a Likert-type scale, with the extremes signifying the best and worst adherence.

The validation of this theoretical stage included content analysis and a pilot application for semantic analysis by judges. In the test's content analysis, the judges were experts in the construct'sfield. For the semantic analysis, the judges were subjects from the target population.[9,10] For the content analysis stage, Alexandre & Coluci[11] recommended the necessary expertise, establishing the following criteria for selecting judges: having a doctorate; having a thesis in the construct's area of interest; having an article or book chapter published in an indexed journal on the construct's area of interest in the last three years or participated in examination boards in the construct's area of interest in the last three years; and updated their CV up to six months before the search.

Eight judges participated in this stage. Each judge received an invitation letter by e-mail, an analysis tool for the initial version of the scale, the acceptance form, and the Informed Consent Form (ICF). The analysis tool contained brief guidelines on the criteria to be analyzed in each question and the respective score that could be assigned, and space for suggestions on each criterion. The criteria used were established according to Pasquali:[12]

1. Behavior
2. Objectivity
3. Simplicity
4. Clarity
5. Relevance
6. Precision
7. Modality
8. Typicality
9. Validity
10. Credibility

A score of "0" was set for "criterion not met" and "1" for "criterion met". The acronym "NA" was also established for "not applicable" if the judge considered that the criterion did not fit the question. There was no unanimity regarding the interpretation of the evaluation by judges, so we followed the aspects discussed in a review by Alexandre and Coluci.[11] The mean score the judges gave each question was calculated, considering the criteria mentioned. As there are 10 of these, we decided that a total score of eight points would be acceptable for each question.The content validity index (CVI) was calculated considering the number of judges who gave at least eight points to each question, defining a minimum CVI of 0.80 as adequate. The number of judges giving each question 8, 9, or 10 points was then added and divided by the total number of judges. Questions with a CVI of less than 0.80 were modified to make the material suitable.

For the semantic analysis, we selected the Virgílio Távora PHC Unit (UAPS) in Fortaleza, Ceará, Brazil, with the most significant number of SAH or DM2 users, according to information provided by the Municipality's Health Secretariat. The scale was applied to a convenience sample of 30 individuals, as suggested by Coluci, Alexandre, and Milano,[13] and we identified the difficulties in understanding the terms in the items.We then elaborated the final version of the scale after the content and semantic analysis.

Experimental stage

Data were collected from six PHC Units (UAPS) in Fortaleza, Ceará, Brazil, divided into six Regional Secretariats and one administrative unit. One unit per Regional Secretariat was chosen. The criterion was the information the Fortaleza Municipal Health Secretariat provided about the units with the highest number of SAH and DM2 users. The following units were selected: UAPS Virgílio Távora (SER I), UAPS Irmã Hercília (SER II), UAPS Humberto Bezerra (SER III), UAPS Luís Costa (SER IV), UAPS Argeu Herbster (SER V), and UAPS Terezinha Parente (SER VI).

The sample was established according to Hair et al.[14], who recommended a proportion of 10 people per item in the questionnaire. As the scale in question had 10 questions with five items each, the minimum number of people to make up the sample was set at 500 individuals. We included 600 individuals, 300 with SAH and 300 with DM2, for a 20% safety margin. The sample was by convenience and comprised 100 respondents per administrative regional office.

The inclusion criteria were: users of the Unified Health System with SAH or DM2, aged 18 or over, both sexes, literate, and without cognitive deficits that could interfere with understanding the information to be collected. Individuals who had already undergone coronary surgery or had a previous history of myocardial infarction and pregnant women were excluded.

Data were collected from September 2018 to July 2019 by eight previously trained undergraduate nutrition students. Besides applying the scale, data on gender, age, income, schooling, place of residence, household income, smoking, alcohol consumption, and previous history of coronary heart disease were also investigated.

Analytical stage

A total of 598 of the 600 expected patients answered the PSADT-CNCD. However, due to the omission of some items from the scale, the responses of 568 patients were qualified for the validation procedure. Although the initial idea of the survey was to distribute the respondents equally between those with DM2 (n=300) and SAH (n=300), data collection was by convenience. The distribution was 58.98% (n= 335) of individuals who reported having SAH, 13.73% (n=78) DM2, and 27.29% (n=155) reported having both DM and SAH.

The survey questionnaire initially consisted of 10 questions. Each answer was rated from 1 to 5 points. The survey validation procedure was run initially based on the 10 questions, assuming the significance of all statistical tests at α=0.05. The Shapiro-Wilk test was used to assess the scale's total score distribution.

The internal consistency measures selected were Cronbach's alpha and McDonald's omega, considering values equal to or greater than 0.70 as acceptable.[15] The Cronbach-α was also investigated, removing the questions individually.[16] We performed factor analysis of the scale's main components using Varimax rotation, checking the suitability of the sample for such analysis employing the Kaiser-Mayer-Olkin (KMO) and Bartlett's sphericity tests. According to Williams, Onsman, and Brown,[17] the analysis can be conducted if the KMO is more significant than 0.5 and if Bartlett's test of sphericity is significant ($p < 0.05$).

The tests were runthrough IBM SPSS Statistic version 23.0. The JASP 0.18.3 software was used to calculate the McDonald'somega.

Ethical aspects

The project was designed under Resolution N° 466/2012, submitted to and approved by the Human Research Ethics Committee of the State University of Ceará, under CAAE N° 18054613.0.0000.5534. Participants were informed about the purpose and procedures of the research and signed the Informed Consent Form.

RESULTS

Approximately 87.15% (495) of the 568 respondents were female, and 12.85% (73) were male. The mean age was 57 years (SD=± 11.72). Most of the population interviewed had low education and income levels, i.e., eight years or less of schooling (61.90%) and income of up to three minimum wages (94.19%), were not married (55.11%), were unemployed (42.25%), and lived in the capital (98.94%).Table 1 shows the mean score per question assigned by the judges to the pre-established competencies and the respective CVI.

Table 1. Mean score given by the judges to each question of the Predictor Scale for Adherence to Diet Therapy in Chronic Non-Communicable Diseases (PSADT-CNCD) and respective Content Validity Index (CVI). Brazil, 2018-2019.

Questions	Mean scores	CVI
1	8.14	0.86
2	9.38	0.88
3	9.75	1
4	**8.00**	**0.75**
5	**8.17**	**0.67**
6	8.57	0.86
7	9.43	1
8	8.86	0.86
9	9.43	0.86
10	10.0	1

Source: Elaborated by the authors.
Captions:

Question 1: Do you know what diet is right for you? **Question 2**: Do you always remember to follow your doctor's/nutritionist's instructions regarding your diet? **Question 3**: Do you change your diet without first consulting your doctor/nutritionist? **Question 4**: Do you adjust your diet according to how you feel? **Question 5**: If food-related symptoms appear (stomach pain, liver pain, skin redness, loss of appetite, and bloating). **Question 6**: Do you think your diet is necessary for your health? **Question 7**: Does your doctor/nutritionist ask you about diet-related problems that are happening to you? **Question 8**: Do you tell the truth when your doctor/nutritionist asks you about food-related problems? **Question 9**: How often do you feel comfortable asking your doctor/nutritionist questions about your diet? **Question 10**: Do you understand the dietary advice given by your doctor/nutritionist?
CVI: Content Validity Index. Considered adequate when equal to or greater than 0.80.

In questions 4 and 5, which had a CVI below the established level, the judges' main suggestions were related to constructing the questions to make them easier to understand. Regarding question 5, two judges felt it did not assess the latent trait the construct set out to measure. The judges' suggestions were accepted.

The scale was well understood during the pilot application with the target population. Although the judges suggested replacing the term "food" with "diet" in question 4, users found that the term "food" was better understood and reverted to this term. The main pathologies investigated, DM2 and SAH, were given simplified explanatory text alongside the respective terms, as it was difficult for the respondents to tell which disease they had.

PSADT-CNCD internal consistency was checked using Cronbach's α coefficient, whose value was 0.67, indicating intermediate reliability and homogeneity. The coefficient value was investigated again, this time removing individual questions (Table 2), and the coefficient value was higher when question 5, which had the highest variance and lowest

correlation, was excluded (α=0.709). This question asked about the respondent's behavior if food-related symptoms appeared (stomach pain, liver pain, skin redness, loss of appetite, and bloating).

Table 2. Cronbach's α values after removing each question from the Predictor Scale for Adherence to Diet Therapy in Chronic Non-Communicable Diseases Scale (PSADT-CNCD). Brazil, 2018-2019.

Removal of one question at a time, considering the 10-question scale (Q1 TO Q10)				
Questions	Mean	Variance	Correlation	Cronbach's a
Q1	19.69	37.330	0.384	0.603
Q2	19.39	34.567	0.548	0.563
Q3	18.96	36.882	0.468	0.586
Q4	19.38	38.639	0.338	0.614
Q5	**19.45**	**44.844**	**0.050**	**0.709**
Q6	20.62	44.494	0.104	0.652
Q7	19.42	36.695	0.331	0.617
Q8	20.67	41.002	0.391	0.612
Q9	20.11	39.372	0.298	0.623
Q10	20.52	39.449	0.463	0.598
Removal of one question at a time, considering the 9-question scale (after excluding Q5)				
Q1	17.11	35.323	0.402	0.680
Q2	16.82	32.786	0.557	0.646
Q3	16.38	34.724	0.500	0.661
Q4	16.81	36.753	0.348	0.691
Q6	**18.04**	**42.452**	**0.121**	**0.721**
Q7	16.84	34.372	0.364	0.692
Q8	18.09	39.417	0.375	0.689
Q9	17.53	36.994	0.337	0.693
Q10	17.94	37.667	0.468	0.674

Source: Elaborated by the authors.
Captions:

Question 1: Do you know what diet is right for you? **Question 2**: Do you always remember to follow your doctor's/nutritionist's instructions regarding your diet? **Question 3**: Do you change your diet without first consulting your doctor/nutritionist? **Question 4**: Do you adjust your diet according to how you feel? **Question 5**: If food-related symptoms appear (stomach pain, liver pain, skin redness, loss of appetite, and bloating). **Question 6**: Do you think your diet is necessary for your health? **Question 7**: Does your doctor/nutritionist ask you about diet-related problems that are happening to you? **Question 8**: Do you tell the truth when your doctor/nutritionist asks you about food-related problems? **Question 9**: How often do you feel comfortable asking your doctor/nutritionist questions about your diet? **Question 10**: Do you understand the dietary advice given by your doctor/nutritionist?

Cronbach's α: Statistical test to verify the scale's internal consistency, with values equal to or greater than 0.70 considered acceptable.

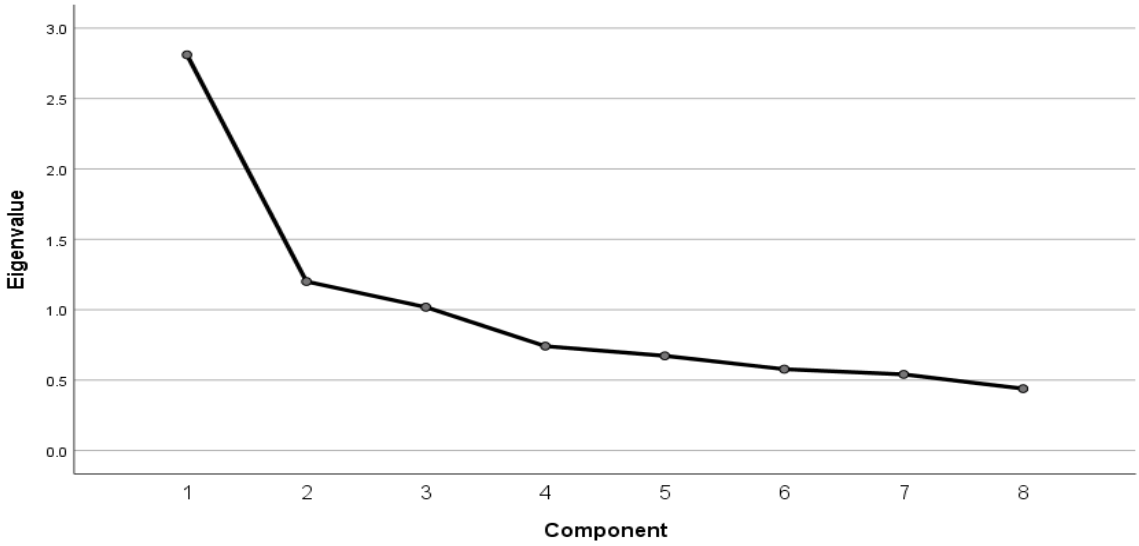
Despite the adequate level of reliability and homogeneity in the nine-question scale, we conducted additional analyses, and new questions were removed. The coefficient increased (α=0.72) when question 6, which had the highest variance and lowest correlation, was removed. This question asked about the respondent's opinion on the need for food for their health.

Removing other questions did not influence the coefficient. In the eight-question integrated scale, the values obtained for internal consistency were 0.73 for Cronbach's α and 0.73 for McDonald's Omega.

We performed factor analysis using Varimax rotation. Three components were obtained, which explained 62.8% of data variability. The first component was loaded by questions Q1-Q4, the second by questions Q8-Q10, and the third by questions Q6 and Q7.The Cronbach-α coefficients were also calculated for each component indicated in the questionnaire. The Cronbach-a coefficient's values for the first component were 0.71, and for the second and third components, 0.6 and 0.2, respectively.

The questionnaire components were also defined using the Cattell criterion (based on the eigenvalues shown in Figure 1), through which we could select just one component. However, based on the results obtained and the experience of the questionnaire's authors, the authors decided not to split the questionnaire into separate parts.

Figure 1. Cattell's criterion scree-plot considering eigenvalues. Brazil, 2018-2019.



Source: Elaborated by the authors.

Box 1 shows the final version of the scale. As mentioned in the methods, we assigned scores from 1 to 5 for each answer on the scale, with a maximum possible score of 40 points.

Box 1. Definitive version of the Predictor Scale for Adherence to Diet Therapy in Chronic Non-Communicable Diseases Scale (PSADT-CNCD).

Predictor Scale for Adherence to Diet Therapy in Chronic Non-Communicable Diseases Scale (PSADT-CNCD)

Below are 8 questions with alternative answers. Please check with an "x" on each question the alternative you most agree with regarding your behavior, situation, and opinion. Please feel free to answer what you think.

1. Do you know what diet is right for you?
a) YES, absolutely
b) YES, probably
c) Not sure
d) Probably not
e) NO, absolutely

2. Do you always remember to follow your doctor's/nutritionist's instructions regarding your diet?
a) Sempre
b) Almost always
c) Sometimes
d) Rarely
e) Never

3. Do you change your diet without first consulting your doctor/nutritionist?
a) Never
b) Rarely
c) Sometimes
d) Frequently
e) I don't follow any advice from my doctor/nutritionist

4. Do you adjust your diet according to how you feel?
a) No, I strictly follow the doctor's/nutritionist's guidelines, no matter how I feel
b) Yes, I change some meals when I feel good
c) Yes, I temporarily stop following my diet when I feel well (only one day a week)
d) Yes, I temporarily stop following my diet when I feel well (more than one day a week)
e) Yes, I completely stop following my diet when I feel well

5. Does your doctor/nutritionist ask you about diet-related problems that are happening to you?
a) Yes, at each appointment
b) Yes, generally
c) Yes, but only sometimes
d) Yes, but rarely
e) No, never

6. Do you tell the truth when your doctor/nutritionist asks youabout food-related problems?
a) Yes, always
b) Almost always
c) I try to tell the truth, but sometimes it's hard to say that I'm not following the doctor's/nutritionist's instructions
d) Sometimes yes, sometimes no
e) No, I don't. I think it's only my business

7. How often do you feel comfortable asking your doctor/nutritionist questions about your diet?
a) Always
b) Almost always
c) Sometimes
d) Rarely
e) Never

8. Do you understand the dietary advice given by your doctor/nutritionist?
a) Always
b) Almost always
c) Sometimes
d) Rarely
e) Never

Source: Elaborated by the authors.

The scale score showed an asymmetrical distribution (Figure 2) and was statistically significant per the results of the Shapiro-Wilk test ($p<0.001$). For this reason, the scale levels were determined based on the percentile scale (Figure 2).

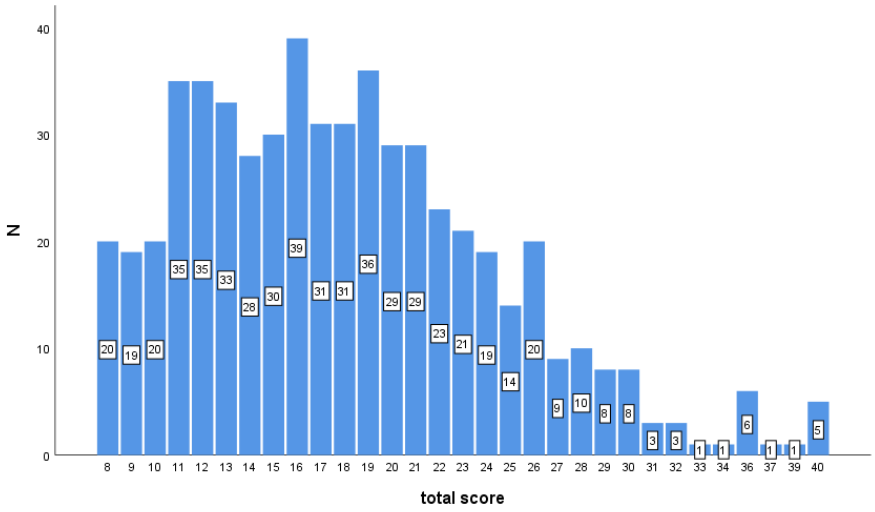
Considering the scores related to the answers given by the respondents, we assumed that a score below the 35thpercentile indicated low adherence; a score between the 35thand 65thpercentiles indicated medium adherence; a score between the 65thand 95th percentile indicated greater adherence; and finally, a score above the 95thpercentile indicated the expected adherence.

Alternatively, scoring less than 15 on the entire questionnaire indicated low adherence; scoring 16-20 points indicated medium adherence; scoring 21-30 corresponded to high adherence; and scores above 31 were classified as expected adherence. The distribution of total scores is shown in Figure 2.

Figure 2. Total score distribution of the PSADT-CNCD Scale. Brazil, 2018-2019.

Total Score

		score	Scale
Percentiles	10	10.00	Low
	15	11.00	
	20	12.00	
	25	13.00	
	30	14.00	
	35	15.00	
	40	16.00	Medium
	45	16.00	
	50	17.00	
	55	18.00	
	60	19.00	
	65	20.00	
	70	21.00	High
	75	22.00	
	80	23.00	
	85	25.00	
	90	26.10	
	91	27.00	
	92	28.00	
	93	28.00	
	94	29.00	
	95	30.00	
	96	30.00	Expected
	97	32.00	
	98	36.00	
	99	39.31	



Source: Elaborated by the authors.
Captions: In the image, the term "score" refers to the score that can be obtained on the scale, with low adherence being when the score ranges from 10 to 15 scores, medium from 16 to 20 scores, high from 21 to 30, and expected when higher than 30 scores.

DISCUSSION

The scale showed high reliability and validity in its results, demonstrating that it is feasible to use it to measure the latent trait defined in this study, i.e., to observe the propensity of individuals with NCDs to follow (or not) dietary guidelines in a quick and simplified way.

The PSADT-CNCD was developed and validated in Brazil. Having an instrument developed in the mother tongue brings significant advantages for its application in the population, as scales developed in other languages may offer insufficient detail or be more challenging to interpret.[16]

Two judges evaluated question 5 as unsuitable for measuring the latent trait and inadequate in the statistical tests, and it was appropriate to remove it from the questionnaire. The presence of more than one symptom in the same question could lead to confusion, and the answer would lead to behaviors adopted in specific situations rather than globally. Question 6 also seemed to add nothing to Question 1, and it was hard to separate "being suitable" from "being necessary".

Adherence is a complex issue that is affected by various aspects. It requires effective means to determine the behavior and commitment of the individuals assisted,[8,18] transcending simple observation and allowing professionals to use valid data to guide their conduct.

The PSADT-CNCD identifies which individuals are more likely not to follow the prescribed recommendations, allowing professionals to direct their efforts towards this group, detecting behaviors taken outside the guidelines, detecting flaws in the approach, and enabling more individualized and motivating guidance. For many NCDs, health professionals can only detect inadequate adherence when an adverse health event occurs.[19] One advantage of using the PSADT-CNCD is that it behaves like a screening tool.Considering the reality of the Unified Health System (SUS), with high care demand and insufficient nutritionists[20] to attend to the public and performtheir other activities,this tool will enable care to be implemented.

The adherence scales for people with SAH and DM found until this study was performed generally checked adherence to medicine therapy. A specific dietary pattern was being investigated where publications measured adherence to diet therapy. The work by Zaragoza-Martí et al.[21] is an example of this reality.In their systematic review, the authors found 27 published studies addressing exclusively adherence to the Mediterranean diet, with consistent results.The authors mention that none of the scales detailed their cross-cultural adaptation process and needed a food frequency questionnaire validated in the country in which they were developed. Their usefulness is, therefore, limited, and the validation process in other populations takes longer.

Hou et al.[22] recently developed and validated a scale to check adherence in DM2 patients. The final version of the scale addresses several related to the condition: dietary adherence, medication, and glycemic monitoring.Although the scale showed excellent results in the statistical tests, there was no acceptable convergent validity for diet therapy. In other words, its internal consistency was satisfactory but unsuitable for checking adherence to diet therapy.

Another point to be made is that the scale is made up of 19 items, which may not be suitable for the reality of primary care, which, as mentioned above, requires simple and quick tools that help professionals who have little time to perform activities beyond the routine already established in their work environment.It would also be burdensome to need two instruments to measure the main NCDs in the health setting, given that, regarding importance, DM2 and SAH are among the three main factors causing premature deaths.[23]

Similar limitations were found in the study by Zhao et al.[24]. The authors show an effective scale for checking several aspects related to the adherence of people with hypertension to the recommendations set out in therapeutic guidelines, including dietary follow-up. However, the scale is limited to assessing the DASH dietary pattern and consists of three sub-scales with 5 or 6 items each, totaling 17 questions.

Making adherence interventions more effective can significantly impact therapeutic results than any improvement in specific treatments.[18] The PSADT-CNCD items allow us to verify aspects related to understanding the guidelines, the relationship with the professional, and behaviors related to dietary guidance without being limited to a specific prescribed diet, i.e., whatever the prescription, the patient can answer the questions set on the scale.PSADT-CNCD also shows potential usefulness for application in populations affected by other pathologies because its questions are not linked to any specific recommendation but rather to the individual's behavior in the face of the recommendations received for their treatment. It can thus be validated in other audiences in the future.

We could not compare the results obtained in the interviews with the respondents' answers to the food frequency questionnaire during this study. Cross-referencing this information would enrich the knowledge obtained on this scale and confirm whether the behavioral trend measured here corresponded to the eating patterns of these individuals.

Another limitation identified was not verifying whether the proportion of men and women treated at the unit was similar to that identified in this study since the UAPS in which the project was conducted needed to have this information. It was, therefore, not possible to calculate the sampling power by gender.

CONCLUSION

The PSADT-CNCD proved to be a simple, short, easy-to-apply, and objective tool to help investigate behaviors that tend to lead to low adherence to the diet therapy recommended for people with NCDs, particularly SAH and DM2, improving dietary guidance actions for this group.

A considerable advantage of this scale is that it is a nutritional screening tool. The answers to the scale can better direct the follow-up of these patients, especially those classified as low or medium adherence, indicating whether the focus should be on better explaining the dietary prescription, improving the professional-patient relationship, or looking for determinants of non-adherent behaviors.

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Contributors

Porto MISO, Sampaio HAC participated in the conception and design, data analysis and interpretation, review and approval of the final version; Kubica A, Buszko K participated in the conception and design and data analysis and interpretation; Almeida LC and Bezerra VM participated in data analysis and interpretation; Carioca AAF participated in data analysis and interpretation, and review and approval of the final version.

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