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Original

Translation and validation of MIDAS for brazilians

Ana Beatriz Vitor de Araújo, Helena Cysneiros, Hugo Feitosa, Taciana Maciel, Débora Wanderley, Daniella Araújo de Oliveira

Federal University of Pernambuco, Recife, Pernambuco, Brazil

Daniella Araújo de Oliveira
daniella.aoliveira@ufpe.br

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Marcelo Moraes Valença

Background and objective: The Migraine Disability Assessment (MIDAS) is a widely used tool for evaluating disability associated with migraines. However, although a translated version exists in Brazil, its adaptation did not follow the methodological standards recommended by guidelines. Therefore, this study aimed to translate and validate MIDAS for the Brazilian population.

Methods

This is a methodological study conducted in two stages: translation and adaptation, following the recommendations of the Professional Society for Health Economics and Outcomes Research, and measurement properties analysis, including intra-rater reliability using the Intraclass Correlation Coefficient (ICC), internal consistency with Cronbach's alpha, content validity through the Content Validity Index (CVI), criterion validity using Spearman's correlation, and content validity evaluated through the CVI based on the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN). A total of 149 individuals participated, comprising both sexes, with a mean age of 38 ± 12 years, all diagnosed with migraine according to the ICHD-3 criteria.

Results

During translation and cultural adaptation, minimal changes were made to the original MIDAS structure. The measurement properties demonstrated moderate intra-rater reliability (ICC = 0.612; 95% Confidence Interval = 0.312–0.803; F (25, 25) = 4.286; $p < 0.001$), internal consistency with a Cronbach's alpha of 0.655, and a weak positive correlation between MIDAS and HIT-6. The global CVI was 0.78, considered satisfactory for content validity.

Conclusion

The MIDAS instrument adapted to Brazilian Portuguese is valid for measuring migraine-related disability.

Keywords:
Data accuracy
Questionnaires
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Introduction

Migraine, a multifactorial neurological disorder causing recurrent headaches, ranks as the second most disabling condition globally, with an 18% prevalence, predominantly affecting women aged 15–49 and impairing quality of life (1–4).

Migraine diagnosis relies on clinical assessment and ICHD-3 criteria but the disease is often underdiagnosed, limiting personalized treatment. Disability assessment tools are essential for improving patient-therapist communication, aligning care with disease severity, and optimizing treatment (3,5–7).

In this context, the Migraine Disability Assessment (MIDAS) emerges as a tool to evaluate the disability experienced by migraine sufferers. It is a practical, self-administered questionnaire that is extremely useful in identifying different levels of disability related to migraine (8). The instrument not only assesses the number of days of activity loss but also the days with reduced productivity. It consists of five questions that analyze days of limitation across various contexts, such as paid work, household tasks, and non-work-related activities, including social, family, and leisure activities (9,10).

The MIDAS has been translated and validated in more than 20 countries, demonstrating good internal consistency, test-retest reliability, accuracy, and validity. These qualities have established MIDAS as a globally utilized tool in research and clinical practice (7). However, the Brazilian translation lacks the methodological rigor required by guidelines (11,12).

Adapting the MIDAS to Brazilian Portuguese with methodological rigor is essential to ensure a valid, reliable tool for assessing migraine-related disability and enabling tailored intervention strategies for the Brazilian population. Therefore, this study aimed to translate and validate the MIDAS questionnaire for the Brazilian population.

Methods

This is a methodological study with a quantitative approach and quantitative measures. The research was conducted at the Learning and Motor Control Laboratory (LACOM) of the Department of Physiotherapy at the Federal University of Pernambuco (UFPE), from August 2022 to March 2024.

Participants were recruited through social media, the Headache Outpatient Clinic at UFPE's Hospital das Clínicas, and the department's Headache Project. They were interviewed and completed an online form to confirm eligibility. Inclusion criteria included individuals aged 18–55 of both sexes with a neurologist-confirmed migraine diagnosis (5).

Exclusion criteria included individuals with secondary headaches or cognitive difficulties that prevented them from answering the questionnaire.

The study was approved by the UFPE Human Research Ethics Committee (Approval No. 4.981.465), and all participants signed an informed consent form

Translation

The MIDAS questionnaire translation followed the 10-step methodology outlined by the Professional Society for Health Economics and Outcomes Research (ISPOR) (11): preparation, translation, reconciliation, back-translation, back-translation review, harmonization, cognitive debriefing, cognitive debriefing review, finalization, and final report preparation.

In the preparation phase, the original MIDAS authors were contacted for authorization to translate and validate the questionnaire for the Brazilian population. Two independent translators then translated the instrument from English to Portuguese. Discrepancies were resolved through comparison, creating a consensus version. A three-member review panel refined the items, addressing linguistic biases, jargon, and potential misinterpretations during the reconciliation process.

The instrument was then back-translated from Portuguese to English by two independent professionals to ensure content alignment with the original. This version was then reviewed by the evaluation panel during the back-translation review and harmonization phases to achieve translation and cross-cultural equivalence. The resulting instrument underwent cognitive debriefing with 30 women to confirm comprehensibility. A cognitive debriefing review then compared the results with the original version, refining translations for cultural relevance.

During finalization, the questionnaire was thoroughly reviewed. The steps undertaken are described in Figure 1.

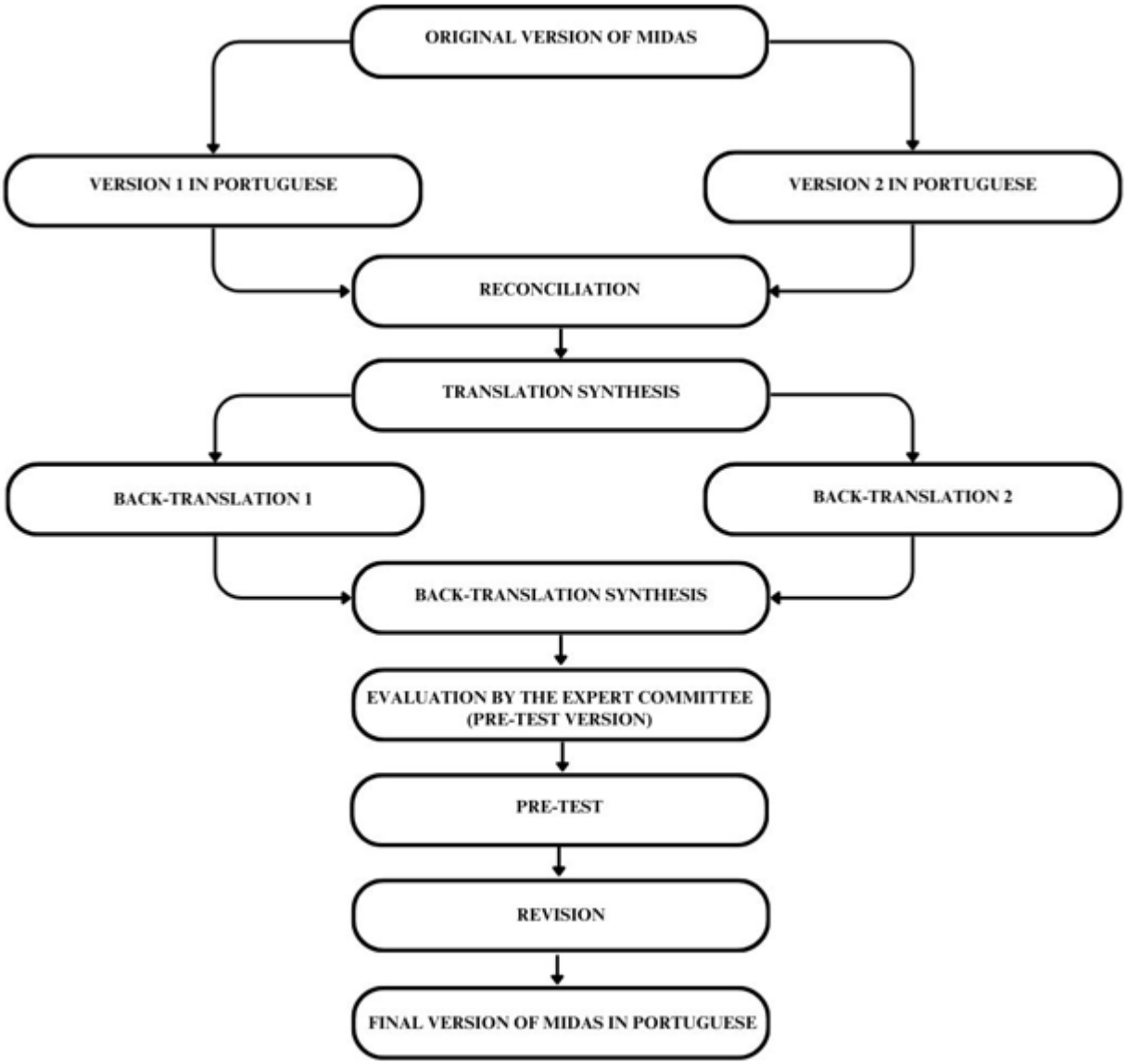

Figure 1. Flowchart of the Translation Process Steps for the MIDAS Questionnaire.

Measurement Properties Analysis

This study follows the recommendations of the Consensus-based Standards for the selection of health Measurement Instruments – COSMIN (12), which recommends analyzing the measurement properties of reliability and validity. Validity refers to the quality of an instrument in accurately reflecting the situation it was designed for, while reliability concerns the precision of measurement, allowing for the reproduction and consistency of results when applied in different situations (13). Reliability was assessed through internal consistency and intra-rater reliability. Internal consistency, measuring the interrelation between questionnaire items, was evaluated using Cronbach's alpha, with values ranging from 0 to 1. A minimum acceptable value is 0.70, and the maximum expected is 0.90 (14). Intra-rater reliability examines the consistency of measurements or assessments performed by the same evaluator under different conditions.

Consistency was measured using the Intraclass Correlation Coefficient (ICC). To avoid memory bias, patients completed the MIDAS at two points, with a 4-week interval. ICC reference values are: <0.50 for weak correlation, 0.50–0.75 for moderate correlation, 0.75–0.90 for good correlation, and >0.90 for excellent correlation (15).

For validity analysis, content validity and criterion validity were assessed. Content validity evaluates how well an instrument's content reflects the construct it aims to measure.

A qualitative approach was used through expert committee evaluation (n=5), and a quantitative approach through the Content Validity Index (CVI). The CVI calculates the percentage of consensus among judges using a Likert scale, with each item's score derived by summing the committee's responses and dividing by the total number of responses. A satisfactory CVI is ≥0.80, preferably >0.90 (16,17).

Criterion validity evaluates the relationship between the scores of a specific instrument and an external criterion, which should have the same characteristics as the assessment instrument and is considered the "gold standard." This study used the HIT-6 questionnaire, a widely applied tool. Spearman's correlation assessed relationships between variables, with values ranging from -1 to +1, where extremes indicate stronger correlations and values near 0 suggest weaker or no correlation (16).

Statistical Analysis

The data were organized in Excel (Version 2019) and analyzed with SPSS (version 29.0) and Jamovi (version 2.3.2). Descriptive statistics reported results and participant sociodemographics as mean and standard deviation.

Results

A total of 149 individuals (mean age: 38±12 years), all diagnosed with migraine, were recruited (Figure 2). Among them, 98% were women, 43% had chronic migraine without aura, and 53% had severe disability (Grade IV) (Table 1).

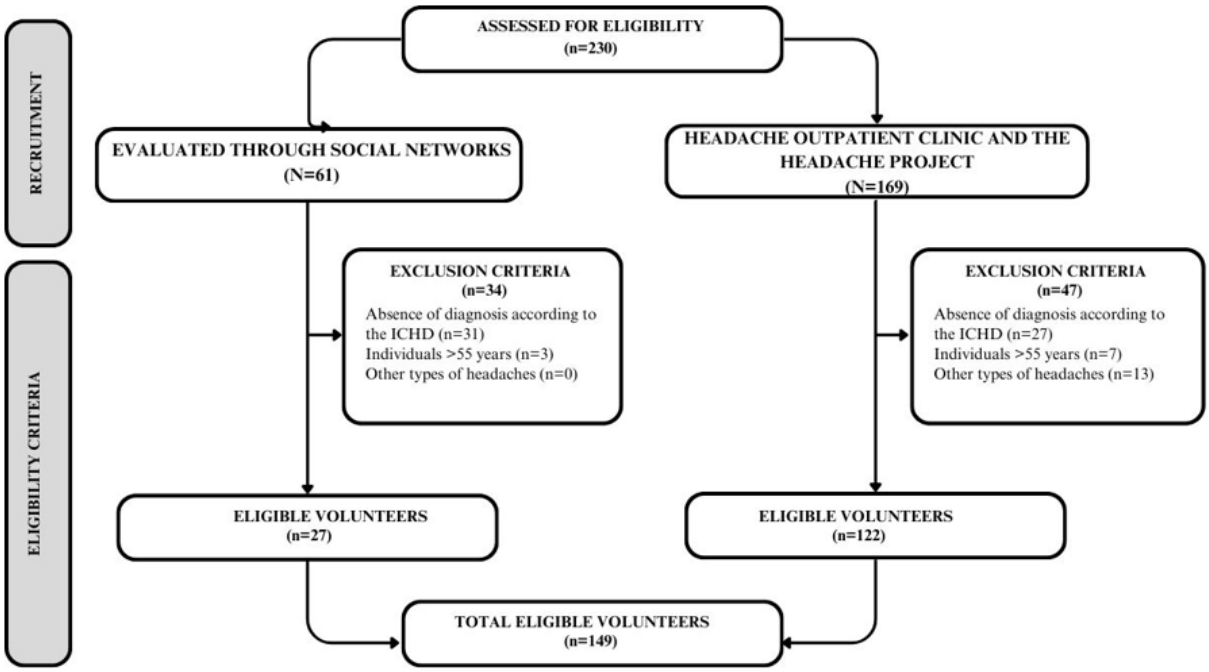

Figure 2. Patient selection flowchart.

Table 1. Sample characterization

Variable	N	%
Sex		
Female	147	98.65
Male	2	1.34
Age (years)		
18-27	44	29.53
28-36	19	12.75
37-45	32	21.47
46-55	54	36.24
Mean	38,4	-
Standard deviation	12,2	-
Diagnosis		
Migraine without aura	8	5.36
Migraine with aura	18	12.08
Chronic migraine without aura	65	43.62
Chronic migraine with aura	48	32.21
Chronic migraine without aura and TTH	7	4.69
Chronic migraine with aura and TTH	2	1.34
Chronic migraine with aura and medication overuse headache	1	0.67
MIDAS		
Level I	27	18.1
Level II	17	11.4
Level III	26	17.4
Level IV	79	53.0
HIT-6		
Little or no impact	0	0
Dome impact	1	3.84
Substantial impact	2	7.69
Severe impact	23	88.46

MIDAS: *Migraine Disability Assessment;* **HIT-6**: *Headache Impact Test*; **TTH**: *tension type headach*

Translation and Cross-Cultural Adaptation

The original author of MIDAS authorized its translation and cross-cultural adaptation into Brazilian Portuguese. Independent professionals translated the questionnaire, followed by reconciliation by a three-member panel (two headache experts and one undergraduate) to resolve discrepancies. Four terms were modified (Table 2), the rest remained unchanged.

Table 2. Demonstration of the adjustments made during the reconciliation stage

Question number	Original versin	Translation synthesis	Final version
3	not do	não fazer	deixou de realizar
5	you miss	você sente falta	deixou de realizar
	Grading System	Sistema de classificação	Sistema de pontuação
	Disability	Deficiência	Incapacidade

Subsequently, retro-translation was conducted by two individuals fluent in English to ensure the version from the reconciliation phase reflected the original instrument's content. After retro-translation, an expert panel reviewed the translation to ensure equivalence in language and cross-cultural semantics during the retro-translation review and harmonization stages. Three concepts needed to be adjusted. The term "por conta" in questions 1-5 was replaced with "devido"; in question three, the expression "deixou de realizar" was changed to "não realizou"; and in item B, the word "considerar" was substituted with "onde." These modifications resulted in the pre-final version for field testing.

The pre-final version was tested on 30 women (mean age: 44±7 years) to assess comprehensibility and cognition. The first 30 registered volunteers participated, and none reported difficulties completing the questionnaire.

The version was reviewed for minor corrections before final approval, with no new term modifications. The finalized instrument (Appendix 1) was applied to 119 individuals (mean age: 36±12 years). Reliability and validity properties were then analyzed.

Analysis of Measurement Properties

Reliability

In the intra-rater reliability analysis, 26 volunteers (mean age: 30±10 years) were randomly selected for evaluation and re-evaluation. Moderate agreement was observed (ICC = 0.612; 95% CI: 0.312–0.803; F (25, 25) = 4.286; $p < 0.001$). Internal consistency, assessed by Cronbach's alpha, was 0.655, indicating moderate reliability.

The reliability values of the Brazilian version, obtained in this study, are compared with those of versions from other countries (Table 3).

Country	Translation	Reliability	
		Internal consistency	Test-retest
Brasil	Brazilian Portuguese	0.65	0.612*
Germany	German	0.69	0.991*
Lebanon	Arabic	0.81	0.987*
Spain	Spanish	0.79	0.81*
USA	English	0.76	0.80 +/§
France	French	-	0.84**
Greece	Greek	0.71	0.987*
India	Hindi	0.90	0.94§
Iran	Persian	0.80	0.71+
Italy	Italian	0.74	0.77+ and 0.81§
Japan	Japanese	0.82	0.83+
Malaysia	Malay	0.84	0.87+ and 0.91§
United Kingdom	English	0.73	0.83 a/b
Taiwan	Chinese	0.79	0.67a

*Test-retest by Intraclass Correlation Index (ICC); + Spearman correlation; § Pearson Correlation; ** Shrout-fleiss Coefficient.

Validity

For criterion validity analysis, a non-parametric correlation matrix was created using Spearman's correlation. A weak positive correlation was found between MIDAS and HIT-6, indicating that greater migraine disability was associated with a higher pain impact (p-value = 0.035; Spearman's Rho = 0.302).

For content validity, a panel of five experts (60% with master's degrees and 40% with doctorates), all experienced in headache, evaluated the translated MIDAS questionnaire for the Brazilian population across three categories: relevance, comprehensiveness, and understanding, responding to 10 questions. Disagreement occurred only in items five and six, where three of five judges found the memory recall period inappropriate and stated no essential concepts were missing (CVI = 0.6). The remaining items met the agreement threshold (CVI > 0.80).

Discussion

This study confirmed that the Brazilian Portuguese version of the MIDAS questionnaire is valid and reliable for clinical and research applications. The sociodemographic variables were aligned with those in validations from other countries and the literature, showing a higher prevalence of women aged 18–55 years (8).

The translation and cross-cultural adaptation aimed to preserve the original questionnaire's fidelity, simplicity, and clarity. Structural changes were minimized to maintain psychometric properties and facilitate version comparisons. The MIDAS demonstrated good comprehensibility, with participants reporting no difficulties in understanding or answering its items.

The reliability was moderate compared to the original version and other language translations (18–28). This result may be related to sample heterogeneity. Participants were recruited from a headache outpatient clinic, primarily chronic patients under medical supervision, and via social media, where treatment details, such as neurologist consultations or prophylactic measures, were unknown. Since these factors can directly influence pain control and questionnaire responses, the variability in experiences and treatment practices likely impacted the Cronbach's alpha value.

For intra-rater reliability, the study used ICC, consistent with recent studies from Greece (21), Saudi Arabia(18), Germany (28), and Spain (19). While the scores were lower than those reported in these versions, they still indicated moderate agreement. This moderate agreement may be due to the 4-week interval between questionnaire administrations, chosen to minimize memory bias. In contrast, previous studies used shorter intervals (up to 3 weeks). A shorter interval might have yielded higher test-retest reliability, potentially increasing the ICC (Table 3).

The study assessed validity by examining the relationship between MIDAS and HIT-6, similar to studies on the French (20) and Hindi (22) versions, which also used HIT-6. Consistent with these studies, a weak but positive correlation was observed, indicating that greater migraine impact corresponds to higher levels of disability.

In content analysis, professionals found the Brazilian version of the questionnaire cohesive, clear, and easy to understand. However, they noted challenges with the 3-month recall period, as participants might struggle to recall the exact number of days. Despite this, the final Brazilian version retained the original 90-day recall period (9), as it provides a more reliable assessment of the patient's experience than a 45-day period.

Conclusion

The Brazilian Portuguese version of the MIDAS questionnaire is a valid, reliable instrument for assessing migraine-related disability in the Brazilian population. The results are aligned with the original version and other validation studies.

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References

1. Khan J, Asoom LI Al, Sunni A Al, Rafique N, Latif R, Saif S Al, et al. Genetics, pathophysiology, diagnosis, treatment, management, and prevention of migraine. Biomedicine & Pharmacotherapy. 2021 Jul;139:111557. Doi: 10.1016/j.biopha.2021.111557
2. Peters G. Migraine overview and summary of current and emerging treatment options. Am J Manag Care. 2019 Jan;25:23–34.
3. Navarro Pérez MP, Marín Gracia M, Bellosta Diago E, Santos Lasaosa S. Epidemiología de la migraña en España y Latinoamérica. Rev Neurol. 2020;71(03):110. Doi: 10.33588/rn.7103.2019266
4. Stovner LJ, Nichols E, Steiner TJ, Abd-Allah F, Abdelalim A, Al-Raddadi RM, et al. Global, regional, and national burden of migraine and tension-type headache, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Neurol. 2018 Nov;17(11):954–76. Doi: 10.1016/S1474-4422(18)30322-3

5. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. Cephalalgia. 2018 Jan 25;38(1):1–211. Doi: 10.1177/0333102417738202
6. Martin VT, Feoktistov A, Solomon GD. A rational approach to migraine diagnosis and management in primary care. Ann Med. 2021 Jan 29;53(1):1969–80. Doi: 10.1080/07853890.2021.1995626
7. Lipton R, Goadsby PJ, Sawyer JPC, Blakeborough P, Stewart W. Migraine: Diagnosis and assessment of disability. Reviews in Contemporary Pharmacotherapy. 2000 Jan;63–73.
8. Stewart WF, Lipton RB, Kolodner KB, Sawyer J, Lee C, Liberman JN. Validity of the Migraine Disability Assessment (MIDAS) score in comparison to a diary-based measure in a population sample of migraine sufferers. Pain. 2000 Oct;88(1):41–52. Doi: 10.1016/S0304-3959(00)00305-5
9. Stewart WF, Lipton RB, Dowson AJ, Sawyer J. Development and testing of the Migraine Disability Assessment (MIDAS) Questionnaire to assess headache-related disability. Neurology. 2001 Mar;56(suppl_1). Doi: 10.1212/WNL.56.suppl_1.S20
10. Lipton RB, Stewart WF, Sawyer J, Edmeads JG. Clinical Utility of an Instrument Assessing Migraine Disability: The Migraine Disability Assessment (MIDAS) Questionnaire. Headache: The Journal of Head and Face Pain. 2001 Oct 4;41(9):854–61. Doi: 10.1111/j.1526-4610.2001.01156.x
11. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: Report of the ISPOR Task Force for Translation and Cultural Adaptation. Value in Health. 2005 Mar;8(2):94–104. Doi: 10.1111/j.1524-4733.2005.04054.x
12. Mokkink LB, Prinsen CAC, Bouter LM, Vet HCW de, Terwee CB. The COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) and how to select an outcome measurement instrument. Braz J Phys Ther. 2016 Apr;20(2):105–13. Doi: 10.1590/bjpt-rbf.2014.0143
13. Echevarría-Guanilo ME, Gonçalves N, Romanoski PJ. Propriedades psicométricas de instrumentos de medidas: Bases conceituais e métodos de avaliação - parte I. Texto & Contexto - Enfermagem. 2018 Jan 8;26(4). Doi: 10.1590/0104-07072017001600017
14. Cronbach LJ. Coefficient alpha and the internal structure of tests. Psychometrika. 1951 Sep;16(3):297–334. Doi: 10.1007/BF02310555
15. Koo TK, Li MY. A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. J Chiropr Med. 2016 Jun;15(2):155–63. Doi: 10.1016/j.jcm.2016.02.012
16. Souza AC de, Alexandre NMC, Guirardello E de B, Souza AC de, Alexandre NMC, Guirardello E de B. Propriedades psicométricas na avaliação de instrumentos: avaliação da confiabilidade e da validade. Epidemiologia e Serviços de Saúde. 2017 Jul;26(3):649–59. Doi: 10.5123/S1679-49742017000300022
17. Costa RM de P, Cardinot TM, Oliveira LP de. Etapas para validação de instrumentos de avaliação da qualidade de vida. Revista Científica Multidisciplinar Núcleo do Conhecimento. 2020 Sep 15;92–102. Doi: 10.32749/nucleodoconhecimento.com.br/saude/qualidade-de-vida
18. Mourad D, Hajj A, Hallit S, Ghossoub M, Khabbaz L. Validation of the Arabic Version of the Migraine Disability Assessment Scale Among Lebanese Patients with Migraine. J Oral Facial Pain Headache. 2019 Jan;33(1):47–53. Doi: 10.11607/ofph.2102
19. Rodríguez-Almagro D, Achalandabaso A, Rus A, Obrero-Gaitán E, Zagalaz-Anula N, Lomas-Vega R. Validation of the Spanish version of the migraine disability assessment questionnaire (MIDAS) in university students with migraine. BMC Neurol. 2020 Dec 24;20(1):67. Doi: 10.1186/s12883-020-01646-y
20. Magnoux E, Freeman M, Zlotnik G. MIDAS and HIT-6 French Translation: Reliability and Correlation Between Tests. Cephalalgia. 2008 Jan 25;28(1):26–34. Doi: 10.1111/j.1468-2982.2007.01461.x
21. Oikonomidi T, Vikelis M, Artemiadis A, Chrousos GP, Darviri C. Reliability and Validity of the Greek Migraine Disability Assessment (MIDAS) Questionnaire. Pharmacoecon Open. 2018 Mar 26;2(1):77–85. Doi: 10.1007/s41669-017-0034-3
22. Juyal R, Verma R, Garg R, Shukla R, Agarwal A, Singh M. Reliability and validity of Hindi translation of the migraine disability assessment and headache impact test-6 questionnaires. Ann Indian Acad Neurol. 2010;13(4):276. Doi: 10.4103/0972-2327.74201
23. Zandifar A, Asgari F, Haghdoost F, Masjedi SS, Manouchehri N, Banihashemi M, et al. Reliability and Validity of the Migraine Disability Assessment Scale among Migraine and Tension Type Headache in Iranian Patients. Biomed Res Int. 2014;2014:1–7. Doi: 10.1155/2014/978064
24. D'Amico D, Mosconi P, Genco S, Usai S, Prudenzano A, Grazzi L, et al. The Migraine Disability Assessment (MIDAS) Questionnaire: Translation and Reliability of the Italian Version. Cephalalgia. 2001 Dec 1;21(10):947–52.Doi: 10.1046/j.0333-1024.2001.00277.x
25. Ligaya M, Sakai F, Kolodner KB, Lipton RB, Stewart WF. Reliability and Validity of the Japanese Migraine Disability Assessment (MIDAS) Questionnaire. Headache: The Journal of Head and Face Pain. 2003 Apr 27;43(4):343–52. Doi: 10.1046/j.1526-4610.2003.03069.x
26. Hung PH, Fuh JL, Wang SJ. Validity, Reliability and Application of the Taiwan Version of the Migraine Disability Assessment Questionnaire. Journal of the

Formosan Medical Association. 2006;105(7):563–8. Doi: 10.1016/S0929-6646(09)60151-0
27. Shaik MM, Hassan NB, Tan HL, Bhaskar S, Gan SH. Validity and Reliability of the Bahasa Melayu Version of the Migraine Disability Assessment Questionnaire. Biomed Res Int. 2014;2014:1–8. Doi: 10.1155/2014/435856
28. Benz T, Lehmann S, Gantenbein AR, Sandor PS, Stewart WF, Elfering A, et al. Translation, cross-cultural adaptation and reliability of the German version of the migraine disability assessment (MIDAS) questionnaire. Health Qual Life Outcomes. 2018 Dec 9;16(1):42. Doi: 10.1186/s12955-018-0871-5

Ana Beatriz Vitor de Araújo
https://orcid.org/0009-0009-4498-2935
Helena Cysneiros
https://orcid.org/0000-0001-6467-8177
Hugo Feitosa
https://orcid.org/0000-0003-3247-5310
Taciana Maciel
https://orcid.org/0000-0002-2039-2668
Débora Wanderley
https://orcid.org/0000-0002-9743-5101
Daniella Araújo de Oliveira
https://orcid.org/0000-0002-6013-978X .

Authors contributions: ABVA: Writing original draft, data curation; HC: Writing original draft, writing review & editing; HF: Conceptualization, writing original draft; TM: Writing original draft, writing review & editing; DW: Conceptualization, writing original draft; DAO: Project administration, writing review & editing, supervision
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