

# Cross-cultural adaptation of the EFFECT questionnaire into Brazilian Portuguese

*Adaptação transcultural do questionário EFFECT para português brasileiro*

Lourrany Borges Costa<sup>1,2</sup>  [lourranybc@unifor.br](mailto:lourranybc@unifor.br)

Shamyr Sulyvan de Castro<sup>2</sup>  [castross@ufc.br](mailto:castross@ufc.br)

Diovana Ximenes Cavalcante Dourado<sup>1</sup>  [diovanaxcdourado@gmail.com](mailto:diovanaxcdourado@gmail.com)

Bruna Soares Praxedes<sup>1</sup>  [brunaspraxedes@gmail.com](mailto:brunaspraxedes@gmail.com)

Thayná Custódio Mota<sup>1</sup>  [thaynamota01@gmail.com](mailto:thaynamota01@gmail.com)

Thais Marcella Rios de Lima Tavares<sup>1</sup>  [thaismarcella25@gmail.com](mailto:thaismarcella25@gmail.com)

## ABSTRACT

**Introduction:** Clinical teaching is based on a real work environment, in professional practice settings, such as health services and units, under the supervision of the preceptor. Providing medical teachers with an assessment of their teaching skills is a powerful tool for improving clinical learning for students in training. In this context, the EFFECT (Evaluation and Feedback for Effective Clinical Teaching) questionnaire was developed by Dutch researchers in 2012 for teacher evaluation, being validated based on the literature about medical teaching in the workplace and incorporates the skills of the Canadian competency-based medical curriculum.

**Objective:** To translate and cross-culturally adapt into Brazilian Portuguese and to validate the EFFECT questionnaire for teacher evaluation by Medical students.

**Method:** Cross-cultural adaptation with the following steps: initial translation of the English version, synthesis of translated versions, back-translation, creation of a consensual version in Brazilian Portuguese, with adaptation, review, and analysis of content validity by an expert committee, pre-test with retrospective clarification interview, and reliability analysis by factorial analysis and internal consistency test (Cronbach's alpha coefficient).

**Result:** In the translation and back-translation stages, the disagreements were related to the use of synonyms and none of the items were modified in terms of their understanding, but in terms of adaptation into the Brazilian context. The evaluation of the expert committee showed the versions maintained the semantic and idiomatic equivalences of the content. Eighty-nine students participated in the pre-test. The internal consistency of the EFFECT questionnaire in Brazilian Portuguese was excellent for all domains, with Cronbach's alpha coefficient ranging from 0.82 to 0.94.

**Conclusion:** The translated and adapted version of the EFFECT questionnaire into Brazilian Portuguese is equivalent to the original instrument and has evidence of high validity and reliability, being able to constitute a national tool to evaluate the efficiency of clinical medicine teaching.

**Keywords:** Educational Assessment; Teaching; Medicine; Translation.

## RESUMO

**Introdução:** O ensino clínico é baseado em ambiente de trabalho real, em cenários de prática profissional, como serviços e unidades de saúde, sob a supervisão do preceptor. Proporcionar aos docentes de graduação médica uma avaliação sobre suas habilidades de ensino é uma ferramenta poderosa para melhorar a aprendizagem clínica dos estudantes em formação. Nesse contexto, o questionário Evaluation and Feedback for Effective Clinical Teaching (EFFECT) foi desenvolvido por pesquisadores holandeses em 2012 para avaliação docente, sendo validado com base na literatura sobre o ensino médico em local de trabalho. Esse instrumento incorpora as competências do currículo baseado em competências canadense.

**Objetivo:** Este estudo teve como objetivos traduzir, adaptar transculturalmente para português do Brasil e validar o questionário EFFECT para avaliação docente por estudantes de Medicina.

**Método:** A adaptação transcultural empregou as seguintes fases: tradução inicial da versão em inglês; síntese de versões traduzidas; tradução reversa; criação de versão consensual em português do Brasil, com adaptação, revisão e análise de validade de conteúdo por comitê de especialistas; pré-teste com entrevista retrospectiva de esclarecimento e análise de confiabilidade por análise fatorial e teste de consistência interna (coeficiente alfa de Cronbach).

**Resultado:** Nas etapas de tradução e tradução reversa, as discordâncias relacionaram-se ao uso de sinônimos, e nenhum dos itens foi modificado em relação ao seu entendimento, e sim na adequação para a realidade brasileira. A avaliação do comitê de especialistas demonstrou que as versões mantinham a equivalência semântica e idiomática do conteúdo. Participaram do pré-teste 89 alunos. A consistência interna do EFFECT em português do Brasil mostrou-se excelente para todos os domínios, com coeficiente alfa de Cronbach variando de 0,82 a 0,94.

**Conclusão:** A versão traduzida e adaptada do questionário EFFECT em português do Brasil possui equivalência cultural com o instrumento original e evidência de alta validade e confiabilidade, podendo constituir-se em instrumento nacional de avaliação da eficiência do ensino clínico de docente de Medicina.

**Palavras-chave:** Avaliação Educacional; Ensino; Medicina; Tradução.

<sup>1</sup> Universidade de Fortaleza, Fortaleza, Ceará, Brazil.

<sup>2</sup> Universidade Federal do Ceará, Fortaleza, Ceará, Brazil.

## INTRODUCTION

The several changes that have occurred in the field of medical education in the last decades, towards the construction of competency-based curricula (CBC) and evaluation of results and performance<sup>1,2</sup>, have led to several intervention proposals in the training of health professionals, generating a new social mission of the Higher Education Institutions (HEIs)<sup>3</sup>. Competency matrices for medical education, both for undergraduate courses, as proposed by the AAMC (Association of American Medical Colleges), and for medical residency, such as CanMEDS, of the Canadian Royal College of Physicians and Surgeons, and the Milestones Project, of the North American Accreditation Council for Graduate Medical Education, constitute the training base for the majority of young medical apprentices in the Western world and are examples for medical schools worldwide<sup>4-8</sup>.

In Brazil, the National Curriculum Guidelines (NCGs) propose the centralization of the teaching of medical training in primary health care (PHC)<sup>9,10</sup>. Therefore, there is a growing interest in the search for innovative ways of teaching that involve ethical, critical, reflective and transformative training<sup>10</sup> and that attract students to PHC and public health<sup>8,11</sup>. The creation of integrated curricula that demonstrate the early integration of students since the first years of undergraduate school with professionals and users of health services, in longitudinal clinical practices is recommended<sup>12-14</sup>.

In parallel with the development of concepts related to teaching over the years, in Brazil, national systems for institutional assessment of higher education have been created and improved, including accreditation processes<sup>15</sup>. Usually, the assessment includes aspects related to the agreement with the NCGs, among others: teaching, research, extension, social accountability, facilities, student performance and the faculty<sup>16</sup>.

The teaching-service integration indicated by the NCGs may encounter obstacles, such as the presence of preceptors and teachers with insufficient training for teaching<sup>14</sup>. The teacher plays a leading role in curricular changes<sup>17</sup> and, for their effective implementation, it is necessary to develop instruments to evaluate the teaching process and for the global assessment of programs and curricula<sup>18</sup>.

Most of the research on medical education assessment focuses on the use of several instruments, based on the competence view that consists of knowledge, skills, and attitudes, in a disintegrated way<sup>19-21</sup>. As for teacher evaluation, there is no standardization, and most initiatives are based on assessments made by the students, with excessively broad, subjective criteria, often answered based on the teachers' personality and not on their skills, and subject to confounding factors<sup>22-25</sup>.

An evaluation method for teachers requires some characteristics to be effective: to be continuous and systematic; include all actors involved in the teaching-learning process; generate information about the educational diagnosis; lead to reflections that can contribute to the improvement of the course and teacher development. It is also necessary to safeguard the anonymity of students and ensure that teachers are not present during the assessment<sup>26</sup>.

Most medical professors are trained in a hospital-centered model, in which most of their experiences derive more from their clinical knowledge than from specific teaching training. Therefore, teacher training is essential for the development of competency-based education, as it is undeniable that isolated clinical training does not provide adequate preparation for the development of health professionals into teachers<sup>17</sup>.

Understanding the importance of teacher evaluation, especially clinical preceptors, and considering the scarcity of instruments for practice evaluation and the satisfactory training of medical competencies, a group of Dutch researchers developed an instrument for teacher assessment by residents called the "Evaluation and Feedback for Effective Clinical Teaching" (EFFECT Questionnaire), which was validated based on the literature on medical teaching in the workplace and incorporating the CanMEDS competencies<sup>27,28</sup>.

For the best student performance and training of new doctors, one can realize how crucial the continuous processes of faculty and clinical preceptor training are, and the greater application of the tools that assist this process. Therefore, it is undeniable the relevance of the translation and adaptation to the Brazilian reality of an assessment instrument capable of broadly evaluating all aspects inherent to teaching practice, aiming at encouraging continuous evaluation among students, teachers, and the Educational Institution, as well as the promotion of theoretical-practical integration and teaching-society.

This article aims to present the process of translation and cross-cultural adaptation of the EFFECT questionnaire into Brazilian Portuguese, which includes testing its validity and reliability so that it can be used for teaching evaluation by students in Brazilian medical schools.

## METHODS

### Study design

Translation and cross-cultural adaptation that included the following phases<sup>29-33</sup>: 1. Initial translation of the original version; 2. Synthesis of translated versions; 3. Back-translation; 4. Creation of a consensual version in Brazilian Portuguese, with adaptation and review by an expert committee; 5. Initial pre-test, with retrospective clarification interview; 6. Reliability analysis. This study was carried out at Universidade de Fortaleza

(UNIFOR), Ceará, between June 2019 and April 2020. The study received approval from UNIFOR's Research Ethics Committee (Opinion N. 3,341,518, of May 22, 2019).

### The EFFECT questionnaire

The EFFECT questionnaire aims to provide clinical preceptors and tutors with an assessment of their qualities as teachers in clinical practice<sup>27</sup>. The questionnaire was originally validated by its authors based on the literature about medical education in the workplace and incorporates CanMEDS competencies. It is a self-administered questionnaire, containing 58 questions, of which 55 are grouped in 7 domains (The preceptor as a role model; Task allocation; Planning of training activities; Providing feedback; Teaching skills; General characteristics of the preceptor; and Assessment). The answers to each objective question are graded on a 6-point Likert scale (in Portuguese: 1= "*crítico, impossível continuar assim*" (Critical, impossible to continue like this); 2= "*insatisfatório, muitas melhorias necessárias*" (Unsatisfactory, many improvements are required); 3= "*médio, precisa melhorar alguns pontos*" (Regular, needs to improve some points); 4= "*satisfatório, pode melhorar em detalhes*" (Satisfactory, some details can be improved); 5= "*Bom, continue assim*" (Good, keep up the good work); 6= "*excelente, exemplo para os outros*" (Excellent, an example to others); e NAE= not-yet able to evaluate or "*ainda não é capaz de avaliar*"). The "NAE" option can be chosen if a specific item has not (yet) occurred during the teaching process. The last three open questions can be used as complementary comments for the teacher. It takes eight to ten minutes to complete the questionnaire. The questionnaire does not generate a final score; instead, each teacher who is evaluated by the method receives a report with the average scores of each item of the questionnaire (minimum of 1 and maximum of 6) based on the results of the respondents, in addition to the open responses in full. The EFFECT questionnaire was originally developed in Dutch with resident physicians<sup>27</sup> and was translated by the original authors into English, of which version remains unpublished. The instrument has been also validated into the Lithuanian language, in a study with residents of several medical specialties<sup>34</sup>. Thus, as the EFFECT questionnaire showed to be adequate when used in the context of clinical teaching in different medical residencies, it was assumed in this research that it could be tested in the outpatient context of PHC during the undergraduate medical course, without mischaracterizing the translation and adaptation process. The English version was granted, and its use in this study was authorized by the creators of the instrument.

Two items were added to the questionnaire to characterize the participants: age and which year of the medical course they are attending.

### Participants

The study sample comprised 89 medical students from UNIFOR, aged at least 18 years, who agreed to participate in the study and had available time and Internet access. The sample recruitment to participate in the research was carried out by public call, with wide dissemination of the research, in physical form through posters in the educational institution and virtually via the university's own communication application. The questionnaire was sent online, along with the free and informed consent form for obtaining the answers online, using the Google Forms® platform (<https://www.google.com/forms/about/>).

### Procedures

First stage: two certified bilingual translators, independently carried out the initial translation of the English version into Brazilian Portuguese, from June to July 2019. Only one of the translators was aware of the concepts the questionnaire intends to measure, to provide a translation that most closely resembles the instrument in the English version. There was a third translation by one of the study's authors, fluent in English. Therefore, the translated versions T1, T2 and T3 were generated.

Second stage: synthesis by the authors of a translated version, T12.

Third stage: two bilingual translators, one from the Letrare Extension Project of Universidade Federal do Ceará (constituted by young translators from the Language course) and a North American medical student fluent in Brazilian Portuguese, independently back-translated the T12 synthesis version from Brazilian Portuguese into English, to ensure the accuracy of the translation. Thus, the versions BT1 and BT2 back-translated into English, were created. The BT1 and BT2 items were compared with the English version, and then the choice of the best version of each item was made to adjust T12. This is a validity check process to ensure that the translated version reflects the same item content as the English version. This step often improves the unclear text, highlighting gross inconsistencies or conceptual errors in the translation.

Fourth stage: a group of 6 experts (including teachers of medicine, experts in medical education, professionals familiar with the construct of interest and the translators), using the Content Validity Index (CVI)<sup>29,34</sup> defined, together with the authors of this study, a consensual translated version in Brazilian Portuguese (VCPB, *versão consensual em português do Brasil*) adapted to the cultural characteristics of Brazil. The CVI measures the proportion or percentage of judges in agreement with certain aspects of an instrument and its items. It consists of a Likert scale with a score of 1 (non-equivalent item) to 4 (absolutely equivalent item). The items that received a score

of 1 or 2 were reviewed. The acceptable level of agreement of the content among the members of the expert committee must be at least 0.80 and, preferably, higher than 0.90<sup>29,34</sup>. The committee was responsible for a review of all the translation phases and evaluated whether the translated versions (T1, T2, T3, T12, VCPB), the back-translated ones (BT1 and BT2) and the English version showed semantic, idiomatic, experimental, and conceptual equivalence<sup>35</sup>.

Fifth stage: with the final version in Brazilian Portuguese (VFPB, *versão final em português do Brasil*), this version was applied in a pre-test, in November 2019, answered by 89 participants. Additionally, a question was added to the end of the questionnaire to obtain suggestions for possible changes. The minimum number of respondents recommended for a pre-test is 30 to 40 subjects<sup>32,36,37</sup>.

The researchers asked the participating students to answer the questionnaire thinking about their current or last PHC preceptor (longitudinal practical care discipline, which happens throughout the UNIFOR curriculum). After the questionnaires were completed by the respondents themselves, the authors performed a retrospective clarification interview with twelve participants to check whether there were items difficult to understand, irrelevant or offensive, and to verify the understanding of each item using the verbal probing technique (cognitive interview in which the interviewer asks research questions specifically designed to extract more detailed information in addition to those usually provided by the interviewees)<sup>38</sup>. The understanding of the items by less than 80% of the interviewees or the suggestion of modifications by more than 20% of the respondents was established as a criterion for reviewing and modifying the translated version<sup>39</sup>.

Sixth stage: validation of the final version through psychometric tests of dimensional structure evaluation (exploratory factor analysis – EFA)<sup>40,41</sup> and Cronbach's alpha reliability test (internal consistency)<sup>42,43</sup>.

## Data analysis

A descriptive statistical analysis was performed, with the presentation of means, standard deviations and factorial load for each of the 55 variables in the translated questionnaire<sup>40</sup>. Factor analysis (FA) is used to investigate latent relationships for a large number of variables (in this case, questionnaire items) and to determine whether the information can be summarized in a smaller set of factors. Therefore, one can assess whether a research instrument, such as a questionnaire, is measuring what it is intended to measure. The factor can be defined as a linear combination of the original variables. The factors represent the latent dimensions (also called constructs), which

summarize the original set of variables, while maintaining the representativeness of the characteristics of the original variables. The analysis can be exploratory factorial (EFA) or confirmatory factorial analysis (CFA). The dimensionality found in previous studies can be accessed initially by EFA<sup>40,41</sup>, a technique used in the present study. Thus, we have several items to measure each latent construct (factor), which is not directly observable. The correlation coefficient is the covariance corrected by the differences in standard deviation. Therefore, the factor analysis identifies variables that have the same underlying structure.

To verify the internal consistency of each domain and of the questions as a whole, Cronbach's alpha coefficient was used, considering values > 0.7 as an acceptable standard<sup>42,43</sup>. Cronbach's alpha coefficient assesses the degree to which items in a data matrix are correlated with each other. It is the most frequently used method in cross-sectional studies. All analyses were performed using the Stata 15.1© software (StataCorp LLC, College Station, TX, USA).

## RESULTS

Eighty-nine students participated in the study, divided by medical course semester: 15 from the third (16.9%), 4 from the fourth (4.5%), 16 from the fifth (18%), 12 from the sixth (13.5%), 17 from the seventh (19.1%), 12 from the eighth (13.5%) and 13 from the first semester of medical internship (14.6%) (Table 1). The mean age of the participants was 22.9 years (range 19-41, SD 4.29).

Since this article has two related but different objectives, the results will be presented in 2 separate sections. The first one will deal with the results of the process of translation and cross-cultural adaptation of the questionnaire; and the second will show the data pertinent to the description of the characteristics of variables and the internal consistency psychometric data.

**Table 1.** Distribution of participants according to the course period.

Course period	N (Total = 89)	%
I1	13	14.6
S3	15	16.9
S4	4	4.5
S5	16	18.0
S6	12	13.5
S7	17	19.1
S8	12	13.5

Abbreviations: I = Internship; S = Semester of medical course.

## Translation and cross-cultural adaptation of the EFFECT questionnaire content

During the initial translation process from the English version into Brazilian Portuguese, some disagreements can be observed between the translators (T1 and T2) regarding the two translations. The differences, however, were minimal, using synonymous words and writing forms that did not change the meaning; for instance: Translator 1 translated the phrase “treat patients respectfully” as “tratar os(as) pacientes de maneira respeitosa”, while translator 2 translated as “tratar o paciente de forma respeitosa”. The most critical items were reviewed in the following stages of analysis by the expert committee and after interviewing the pre-test respondents.

In the back-translation stage, there were no difficulties when back-translating the items. Although the BT1 and BT2 versions did not have many items that were literally equal to the English version, they maintained the semantic equivalence.

During the adaptation stage, words, expressions and verbal conjugations were changed, aiming to improve the subject’s understanding in the Brazilian context. Moreover, at this stage, possible errors in grammar, spelling, typing and formatting were observed and corrected. The level of agreement between the experts, using the Content Validity Index, varied between 1 and 0.833 for all statements and items of the questionnaire.

Throughout the statements, the words “instructor/supervisor” were translated as “preceptor/supervisor”. In item 1, originally “ask for a patient’s history”, we chose the literal translation “perguntar o histórico do(a) paciente” instead of the expressions “realizar anamnese” or “coletar história”, which are common in Brazil, to maintain better translation equivalence. The expression “have a bad news conversation” in item 11 was changed to “transmitir más notícias ao paciente”. Item 31, “how I monitor the boundaries of my clinical work”, was translated as “minha postura ética durante meu trabalho clínico” due to the strangeness of the literal translation “como eu monitoro as fronteiras do meu trabalho clínico”.

Some expressions were modified due to cultural adaptation. Item 34, “how I make my reports”, in the context of clinical practice, refers to the activity of recording patient evolution in medical records, so it was translated to “como faço o registro nos prontuários”. Item 53, which in the English version was “reviews my portfolio during the assessment”, was translated as “avalia meu portfólio durante a avaliação”. However, after responses and interviews with the respondent students in the pre-test, it was observed that the word “portfolio” was unknown for some of them, probably because it is a non-standardized evaluation method for all courses

or HEIs. Therefore, a short explanatory text was added after the item. In the “avaliação” (Evaluation) statement section, it was necessary to add the words “formativa” and “somativa” to facilitate the understanding of the sentence: “Durante seu treinamento, ocorreram várias entrevistas sobre o seu progresso. Pode-se enfatizar — quando necessário — os ajustes (durante uma revisão de progresso - formativa), ou na conclusão de parte da sua formação (durante uma avaliação de rodízio ou entrevista de avaliação - somativa)”.

On multiple occasions, English verbs followed by the pronoun “me” were inverted; for instance “gives me” was translated into “me dá”, as it is the more popular idiomatic expression in the spoken Brazilian Portuguese language.

The word “feedback”, which can be translated as “retroalimentação” or “retorno”, remained in English due to its wide use in the educational context and because its use is disseminated in the Brazilian Portuguese language.

## Description of the variables and analysis of construct validity and internal consistency of the questions

The study of the characteristics of the questions shows averages ranging from 4.96 (item 28 – “retorna ao feedback dado anteriormente”) to 5.81 (item 43 – “me trata respeitosamente”).

The factorial loads ranged from 0.2816 (item 3 – “realizar abordagens clínicas”) to 0.9109 (item 33 – “como explico minhas escolhas por uma abordagem particular”) (Table 2). The factorial load can be defined as the correlation of the variable (item) with the factor, indicating how much each variable contributes to the factor (questionnaire construct). If this load has a positive value, it means that the variable is positively correlated with the factor, and, if it has a negative value, this correlation is negative. They are considered significant when they exceed the absolute value of 0.30<sup>44</sup>. Thus, it is observed that, except for item 3, all items of the translated questionnaire were positively correlated to the analyzed domains.

A large proportion of “NAE” responses (*não capaz de responder ainda*) were observed for items 48 (“prepara avaliações de progresso”), 53 (“avalia meu portfólio durante a avaliação”) and 54 (“presta atenção em minha autorreflexão”), all related to evaluation methods.

The description of the data according to the domains is shown in Table 3. The domain with the lowest average was “fornecendo feedback” (average 5.19; SD 0.857) and the one with the highest average was “características gerais do preceptor/supervisor” (mean 5.57; SD 0.714). The lowest internal consistency was found for the domain “cuidando do trabalho significativo” (0.83), and this value being classified as acceptable<sup>36</sup>.

**Table 2.** Characteristics of the questions of the EFFECT translated version.

Domains/Questions	Mean	SD <sup>a</sup>	Factorial load	NAE <sup>b</sup> (n)	NAE (%)
<b>O(a) preceptor(a) como modelo. Ao observar meu(minha) preceptor(a), aprendo como:</b>					
1 perguntar o histórico do(a) paciente.	5.47	0.760	0.6650	8	6.4
2 examinar um(a) paciente.	5.42	0.776	0.7290	6	4.8
3 realizar abordagens clínicas.	5.57	0.746	0.2816	8	6.4
4 cooperar com outros(as) profissionais de saúde na atenção ao(à) paciente e aos seus familiares.	5.43	0.899	0.5971	10	8.0
5 me comunicar com os(as) pacientes.	5.56	0.794	0.5017	9	7.2
6 aplicar resultados de pesquisas acadêmicas.	4.66	1.327	0.6944	20	16.0
7 organizar meu próprio trabalho de forma adequada.	5.21	1.088	0.6288	6	4.8
8 aplicar diretrizes e protocolos.	5.48	0.789	0.7026	11	8.8
9 tratar os(as) pacientes de maneira respeitosa.	5.80	0.499	0.7801	10	8.0
10 lidar com queixas e incidentes.	5.53	0.720	0.6744	12	9.6
11 transmitir más notícias ao(à) paciente.	5.16	1.166	0.4422	26	20.8
<b>Meu(minha) preceptor(a):</b>					
12 indica quando ele(a) não sabe algo.	5.46	0.948	0.5561	13	10.4
13 reflete sobre suas próprias ações.	5.38	1.001	0.6852	14	11.2
14 pede a opinião de outros sobre seu próprio desempenho.	4.97	1.442	0.5808	12	9.6
15 é um bom exemplo de como prover atenção centrada no(a) paciente.	5.63	0.721	0.6444	5	4.0
<b>Atribuição de tarefas. Até que ponto seu(sua) preceptor(a) torna seu trabalho informativo? Meu(minha) preceptor(a):</b>					
16 me dá liberdade suficiente para realizar sozinho(a) tarefas que se adaptam ao meu conhecimento/às minhas habilidades atuais.	5.63	0.839	0.7476	5	4.00
17 me delega tarefas que se adaptam ao meu atual nível de treinamento.	5.67	0.726	0.6099	7	5.6
18 me estimula a assumir responsabilidades.	5.52	0.886	0.8140	8	6.4
19 me dá oportunidade de discutir erros e incidentes.	5.52	0.836	0.5521	8	6.4
20 me ensina a organizar e planejar meu trabalho.	5.19	1.185	0.4899	7	5.6
<b>Planejamento de atividades. Até que ponto seu(sua) preceptor(a) reserva tempo durante o dia para dedicar-se a atividades de treinamento? Meu(minha) preceptor(a):</b>					
21 reserva tempo para me supervisionar/aconselhar.	5.15	1.118	0.6443	8	6.4
22 está disponível quando preciso dele(a) durante o meu turno.	5.52	0.864	0.7697	7	5.6
23 separa tempo quando preciso dele(a).	5.38	0.932	0.7421	10	8.00
<b>Fornecendo feedback. Até que ponto seu(sua) preceptor(a) lhe dá feedback regular e construtivo?</b>					
24 Fundamenta o feedback em observações concretas de minhas ações.	5.21	1.021	0.6776	14	11.2
25 Indica o que estou fazendo corretamente.	5.32	0.936	0.7617	8	6.4
26 Discute o que posso melhorar.	5.04	1.136	0.7383	12	9.6
27 Deixa-me pensar sobre meus pontos fortes e fracos.	4.86	1.186	0.7716	14	11.2
28 Retoma feedbacks dados previamente.	4.59	1.285	0.7623	19	15.2
29 Formula feedbacks de uma maneira que não é condescendente ou insultante.	5.43	0.999	0.8795	20	16.0
<b>Ao dar feedback, meu(minha) preceptor(a) presta atenção em:</b>					
30 minhas habilidades clínicas e técnicas.	5.45	0.747	0.7709	20	16.0
31 minha postura ética durante meu trabalho clínico.	5.35	0.937	0.7838	22	17.6
32 como colaboro com meus(minhas) colegas na atenção aos(às) pacientes.	5.45	0.804	0.9000	18	14.4
33 como explico minhas escolhas por uma abordagem particular.	5.38	0.890	0.9109	23	18.4
34 como faço o registro nos prontuários.	5.36	0.901	0.7940	27	21.6
35 como me comunico com os(as) pacientes.	5.45	0.960	0.8140	23	18.4

Continue...

**Table 2.** (Continuation) Characteristics of the questions of the EFFECT translated version.

Domains/Questions	Mean	SDa	Factorial load	NAEb (n)	NAE (%)
<b>Habilidades de ensino. Até que ponto seu(sua) preceptor(a) contribui para o seu processo de aprendizado? Meu(minha) preceptor(a):</b>					
36 revê meus objetivos de aprendizagem.	5.00	1.136	0.5926	14	11.2
37 discute a maneira como integro a medicina baseada em evidências ao meu trabalho.	5.15	1.113	0.4494	14	11.2
38 discute questões éticas comigo.	5.02	1.231	0.7776	10	8.0
39 me estimula a descobrir coisas por mim mesmo(a).	5.19	1.089	0.8109	9	7.2
40 me estimula a fazer perguntas.	5.33	1.015	0.8970	5	4.0
41 me estimula a participar ativamente das discussões.	5.37	0.988	0.9019	8	6.4
42 explica claramente questões médicas complexas.	5.26	1.123	0.6781	4	3.2
<b>Características gerais do(a) preceptor(a). Até que ponto seu(sua) preceptor(a) contribui para um ambiente de aprendizado e de trabalho agradável e estimulante? Meu(minha) preceptor(a):</b>					
43 me trata respeitosamente.	5.81	0.537	0.6586	9	7.2
44 é um(a) preceptor(a)/supervisor(a) entusiasmado(a).	5.60	0.813	0.7550	5	4.0
45 deixa claro que posso contar com ele(a).	5.57	0.849	0.6742	6	4.8
46 me apoia em situações diferentes.	5.59	0.763	0.7552	18	14.4
47 está aberto(a) a questões/problemas pessoais.	5.24	1.066	0.5733	23	18.4
<b>Avaliação. Até que ponto seu(sua) preceptor(a) fornece revisões de progresso ou entrevistas de avaliação abrangentes e construtivas? Meu(minha) preceptor(a):</b>					
48 prepara avaliações de progresso.	5.02	1.224	0.7429	12	23.53
49 faz uma conexão clara entre metas de aprendizado previamente definidas durante essas avaliações.	5.39	0.820	0.8650	8	15.69
50 me dá a oportunidade de levantar questões próprias.	5.56	0.719	0.7113	5	9.8
51 formula objetivos de aprendizagem para o período seguinte durante essas avaliações comigo.	5.39	0.930	0.8650	8	9.8
52 explica como a equipe se envolveu na avaliação.	5.51	0.842	0.9018	6	11.76
53 avalia meu portfólio durante a avaliação.	5.02	1.206	0.7697	15	29.41
54 presta atenção em minha autorreflexão.	5.40	0.981	0.6158	11	21.57
55 me dá uma avaliação clara e abrangente.	5.44	0.933	0.9014	8	15.69

Abbreviations: a: SD = standard deviation; b: NAE "not-yet able to evaluate" or "ainda não é capaz de avaliar".

**Table 3.** Description of the characteristics of the EFFECT domains and the internal consistency of its items.

Domains	N. of items	Mean	SD <sup>a</sup>	Alpha <sup>b</sup>
O(a) preceptor(a) como modelo	15	5.40	0.639	0.91
Atribuição de tarefas	5	5.52	0.691	0.82
Planejamento de atividades de treinamento	3	5.35	0.866	0.88
Fornecendo feedback	12	5.19	0.857	0.92
Habilidades de ensino	7	5.20	0.925	0.92
Características gerais do(a) preceptor(a)	5	5.57	0.714	0.90
Avaliação	8*	5.35	0.799	0.94

Abbreviations: a: SD = standard deviation. b: Alpha = Cronbach's alpha coefficient. \* Only 51 respondents.

## DISCUSSION

Over the past few decades, profound changes have occurred in the medical education scenario, such as the introduction of new teaching and assessment techniques, as well as changes in the profile and involvement of university

students<sup>45</sup>. These belong to "Generation Z" and grew up immersed in this reality of technological innovations<sup>46,47</sup>. For this generation, it is necessary to use student-centered methodologies, favoring collaboration, interdisciplinarity, autonomy and critical and citizen education, supporting

the acquisition of communication, leadership, research and management skills<sup>46</sup>.

To follow these changes, it is necessary to review the teacher's role, abandoning the concept of academic or encyclopedic professor, as a mere transmitter of knowledge, and that of the technical specialist<sup>48</sup>, and to start exercising a variety of duties<sup>37</sup>. Therefore, the HEIs have emphasized the evaluation of their teachers based on their clinical competency, teaching skills, personal qualities, involvement with students, quality in providing care to patients, in addition to the ability to provide feedback and guidance throughout the teaching activities<sup>49</sup>.

In this study, the translation, cross-cultural adaptation and evaluation of the validity and reliability of the EFFECT questionnaire were carried out in Brazilian Portuguese, demonstrating that the instrument showed to be valid and reliable to be used in the context of Brazilian medical education. The results show that there were no major difficulties during the stages of translation, back-translation, adaptation and validation by the experts, considering that many educational concepts and values are common to several medical schools worldwide. It is important to note that the respondents' difficulties and doubts in relation to the questionnaire were observed and considered for the preparation of the final version.

The results of this study indicate that the Brazilian version of the EFFECT questionnaire has acceptable psychometric properties and can be used to evaluate the teachers' clinical teaching from the perspective of undergraduate medical students. All domains showed a satisfactory reliability coefficient. It is noteworthy that the participating students indicated that some items 'not-yet able to evaluate' (NAE). Most of these items are due to the domain "*avaliação*"; even though it was answered only by those who responded affirmatively to the domain's introductory question ("*Seu preceptor/supervisor conduz revisões de progresso ou entrevistas de avaliação com você?*"). This fact may be associated with a non-standardization of the evaluation processes of the students' competencies or the fact that these are evaluated in other ways, not necessarily the one present in the questionnaire. Only 4 items of a total of 55 in the questionnaire had an average score lower than 5 (answer equivalent to "*Bom, continue assim*"), demonstrating a good evaluation of the faculty by the students. When the domains were analyzed, all of them obtained an average greater than 5.

In the domain "*o(a) preceptor(a) como modelo*", items 6 ("*aplicar resultados de pesquisas acadêmicas*") and 14 ("*pede a opinião de outros sobre seu próprio desempenho*") were the only ones with an average lower than 5. As for the domain "*planejamento de atividades de treinamento*", a high score (average of 5.52) was obtained when questioning the teacher's availability when the student deemed it necessary. However,

there was a decrease in the score (5.38) when asked whether the preceptor sets aside time for the student when they need it, and a greater decrease (5.15) when asked whether the teacher reserves time to supervise/advise the students. Regarding "*fornecendo feedback*", two items had an average lower than 5: "*me deixa pensar sobre meus pontos fortes e fracos*" and "*retoma feedbacks dados previamente*".

These results demonstrate how important and appreciated by the students is the fact that teachers are open to welcoming their needs and that they plan specific moments for evaluation. The feedback strategy provides the student with a self-assessment and should have an impact on their development. These are complex and dynamic moments of student-teacher interaction<sup>50</sup>. An effective feedback should be assertive, respectful, descriptive, timely and specific<sup>51</sup>. It is expected that the teacher be able to mediate, listen and dialogue, favoring the exchange of ideas and the articulation between the knowledges<sup>52</sup>.

It can be observed that in the "*habilidades de ensino*" domain, there was a good score in relation to encouraging active participation in discussions and encouraging questions (averages of 5.37 and 5.33, respectively). In parallel, a slightly lower score was obtained in several aspects, such as the review of learning objectives (average of 5.0), discussion of ethical issues (average of 5.02) and the integration of evidence-based medicine at work (average of 5.15). This result corroborates the importance of teachers to keep up-to-date on teaching-learning strategies to ensure efficient pedagogical practices<sup>53</sup>.

It is known that there is a lack of teaching professionalization among medical professors, mainly related to teaching skills, and often associated with a lack of knowledge of the curricular structure and the recently-graduated student profile desired by educational institutions. It is necessary to overcome information overload-based teaching, where the teacher is focused on the technique and the mere transmission of information, without integrating disciplines and using student assessment methods, with a sometimes punitive character. This situation can be an obstacle for doctors who do not consider teaching as their main professional activity<sup>54</sup>.

University-level education can be understood in two ways: non-professional, which considers the act of teaching as repeating previous models based on everyday practical experience; and the professional one, which defends teaching as a complex act consisting of skills that can be acquired, improved and expanded through a consistent training process<sup>55</sup>. The criterion of being considered a good medical professional in a specific area of clinical practice, although common when hiring teachers for medical courses, is not enough to guarantee quality teaching.

Regarding the domain “*características gerais do(a) preceptor(a)*”, the item with the highest average (5.81) was related to a respectful student-teacher relationship (item 43). The lower averages were those for items 45 (“*deixa claro que posso contar com ele(a)*”) with an average of 5.57, and 47 (“*está aberto(a) a questões/problemas pessoais*”) with an average of 5.24. Although traditionally, the actions of guiding, orienting and advising in achieving personal goals, also seeking interpersonal and psychosocial development beyond the professional environment are considered the “Mentor’s role, and not specifically the “Preceptor’s” or the “Supervisor’s”, roles that are more associated to teaching in real clinical situations<sup>56</sup>, these results demonstrate that there is still room for improving the student-teacher relationship.

The difficulty in obtaining the adherence of medical teachers to curricular reforms has been recurrent and can be explained by several factors, such as the non-professionalization of the teaching function, partial dedication to schools and insecurity. A study sought to analyze how the medical teachers’ characteristics at a university in Minas Gerais had an impact on the way students evaluate teaching. The data showed that teachers with less time since graduation, less time working as a teacher and less experience but are motivated by the pleasure of teaching, are better evaluated than older and more experienced ones<sup>52</sup>.

In Brazil, a cross-sectional study was carried out with 28 students on the competencies of teachers of the medical course at Universidade Federal do Amapá, using focal groups. The students emphasized the importance of providing formative feedback to teachers. For them, the evaluation helps so that the teacher identifies their deficiencies and can seek ways to solve them, in addition to increasing the bond with the students. The study also showed, in the students’ opinion, that the best way to assess teachers would be through a structured questionnaire with objective and subjective items<sup>26</sup>.

Any instrument designed to assess the quality of education must have good validity and reliability. Moreover, the generated results need to be useful to provide improved teaching, support and motivation for the teachers, academic advancement and promotion, curricular evolution, in addition to providing subsidies for the creation of faculty development programs<sup>57</sup>. These characteristics are present in the EFFECT questionnaire.

In comparison with the original study for the development of the EFFECT<sup>27</sup> questionnaire and another previous study about its validation in Lithuanian<sup>33</sup>, there are some differences in our research that may have influenced the results. The present study was carried out with a smaller number of participants. Moreover, previous studies used the EFFECT questionnaire with resident physicians, while our

study applied it to undergraduate medical students. Another limitation of the present study is that there was no re-test.

The EFFECT questionnaire in its Brazilian Portuguese version showed to be effective and easy to apply, generating information that can be useful for educational institutions to prepare faculty development plans. The university where this study was developed has a Professional Development Program in Education (PDPE, *Programa de Desenvolvimento Profissional em Educação*), coordinated in partnership with the Center Pedagogical Advisors and the Educational Technologies Center, where courses are systematically offered to all university teachers. The PDPE proposes continuing education on current and innovative topics in the context of higher education for teachers. Therefore, there is an expectation that the instrument will be adopted to generate information for the process of planning institutional actions for continuing teacher education.

## CONCLUSIONS

The results of this study indicate that the Brazilian Portuguese version of the EFFECT questionnaire has acceptable psychometric properties for the evaluation of clinical teachers by students from medical courses at Brazilian Higher Education Institutions. It is noteworthy that there is no available validated instrument yet in the local literature that can measure the same teaching competencies as the EFFECT.

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## AUTHORS’ CONTRIBUTION

Lourrany Borges Costa and Shamyry Sulyvan de Castro contributed to the study conception and/or design, the acquisition, analysis and interpretation of data and the critical review of the preliminary version. Diovana Ximenes Cavalcante Dourado, Bruna Soares Praxedes, Thayná Custódio Mota and Thais Marcella Rios de Lima Tavares contributed to the first draft of the manuscript. All authors contributed to the acquisition, analysis and interpretation of the data.

## CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

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