

# Validation: Work assessment scale and interprofessional communication in simulated practice

Giovanna Cristina Conti Machado<sup>1</sup>  Rodrigo Guimarães dos Santos Almeida<sup>2</sup>  Cezar Kayzuka Cotta Filho<sup>1</sup>   
Leandro Yukio Mano<sup>3</sup>  Raphael Raniere de Oliveira Costa<sup>4</sup>  Alessandra Mazzo<sup>5</sup> 

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<sup>1</sup>Universidade de São Paulo - Campus Ribeirão Preto - USP. Ribeirão Preto/SP, Brasil.

<sup>2</sup>Universidade Federal de Mato Grosso do Sul - UFMS. Campo Grande/MS, Brasil.

<sup>3</sup>Universidade do Estado do Rio de Janeiro - UERJ. Rio de Janeiro/RJ, Brasil.

<sup>4</sup>Universidade Federal do Rio Grande do Norte - UFRN. Natal/RN, Brasil.

<sup>5</sup>Universidade de São Paulo - Campus Bauru - USP. Bauru/SP, Brasil.

E-mail: amazzo@usp.br

## Abstract

Interprofessional work revolutionizes the model of health education and practice, and requires effective communication between team members. However, although it has been discussed for more than three decades, its introduction into health courses is still a challenge. To overcome such barriers, the use of clinical simulations allows for the insertion of and reflection on issues within the real practical context. The incorporation of instruments that guide the skills necessary for interprofessional work into the work of facilitators, such as the "Performance Assessment Tools for Interprofessional Communication and Teamwork - Novice" (PACT-Novice), is essential. Thus, this study aimed to translate and validate the construct's content and verify the reliability of the Brazilian version of the PACT-Novice instrument in a simulated context, among students in Brazil. This is a methodological study of translation, cultural adaptation, and validation of content and reliability of the instrument, divided into Phase A - Translation and cultural validation and Phase B - Validation and reliability of the instrument. In Phase A), after analyzing the judges' assessments of the translated version, the final version of the PACT-Students instrument was reached, with a CVI index of 95.0% for all items. For Phase B, the analysis of the set of items that make up the PACT-Students and their relationship with the construct resulted in a Cronbach's Alpha of 0.891. The process of translation and validation of the PACT-Students instrument was efficient, demonstrating high reliability for its application. However, further studies are suggested to reinforce the results obtained.

**Keywords:** Communication. Interprofessional Education. Simulation. Validation Study.

## INTRODUCTION

Training and interprofessional work in healthcare improve the perception of an individual as a whole, from their biological to psychosocial aspects, through the interaction between professionals involved in care<sup>1-4</sup>.

Interprofessional Education (IPE) and Interprofessional Work differ in terms of the context in which they are applied, the latter

being based on the day-to-day interaction of the healthcare service and the former on the professional's learning process, which is in constant training. However, both are based on collaboration and recognition of the interdependence between professions, going against the competition and fragmentation of knowledge disseminated

DOI: 10.15343/0104-7809.202246012022

by the uniprofessional model, in the context of healthcare<sup>5-8</sup>.

Interprofessional work revolutionizes the model of health education and practice, which requires effective communication between team members and a serious collaboration for solving the various issues elucidated by the patient in their multifaceted condition<sup>4-5</sup>.

Uniprofessional education is important in building specific knowledge and skills inherent to each profession, and is not diminished by the introduction of IPE. IPE, through interactive learning between different professions, is complementary to uniprofessional education<sup>6,8</sup>.

Based on the development of competences common to all professions, the specific competences of each professional category and collaborative competences, the IPE allows the student to arrive at resolutions to conflicts and the problems caused by the uniprofessional model. They are also led to address concerns and possible tensions, effectively and as naturally as possible, positively impacting communication and teamwork skills<sup>1-7</sup>. However, although IPE has been discussed for more than three decades, its introduction into healthcare courses is still a challenge around the world, and in Brazil, only recently, with the reformulation of the National Curriculum Guidelines, courses for healthcare professionals can make room for this in their curricula<sup>1,5-7,9</sup>.

In addition to the aspects already mentioned, the difficulties encountered by facilitators and educational institutions in implementing IPE go far beyond the exemplification to students of what interprofessional teaching and practice consists of, as well as other barriers associated with this, such as "How to evaluate the effectiveness of IPE in interprofessional practice?", "How to introduce the concepts and the reality of interprofessional work if the real practice scenario is still in its beginning stages?", and "Which aspects are essential

for the development of professionals who are able to effectively develop interprofessional work?"<sup>6-7</sup>.

To overcome such barriers, more active teaching and learning strategies that provoke students to have new considerations have been introduced into their training. Among them, the use of clinical simulation can be cited as promising for this purpose, since a mimicked and protected context allows for the insertion and reflection on issues of the real practical context<sup>10-11</sup>. Based on the axes of knowledge, know-how, and demonstration, clinical simulation is related to the gain of knowledge and self-confidence, which is reflected in self-efficacy in a real clinical situation. Moreover, it is clear that it can lead to the development of skills such as interprofessional communication, knowledge of the other's knowledge, and an increase in the quality of patient-centered care<sup>1-2,12</sup>, which are essential characteristics of interprofessional work.

Therefore, it is imperative that guidelines and instruments that guide the skills necessary for interprofessional work can be incorporated into the work of facilitators, in simulated clinical practices, during IPE.<sup>6,9,12-13</sup> However, such documents are still scarce in the country and are beginning to be disseminated among international bodies<sup>10,14</sup>.

In this context, an instrument of American origin was researched, for use in IPE, the "Performance Assessment Tools for Interprofessional Communication and Teamwork - Novice (PACT-Novice)"<sup>13</sup>, whose purpose is the assessment of communication skills and team collaboration for the development of interprofessional practice.

Thus, with the purpose of enabling the use of such a tool for the consolidation of IPE strategies, this study aimed to translate and validate the construct content and verify the reliability of the Brazilian version of the PACT-Novice instrument in a simulated context, among students in Brazil.

## METHODOLOGY

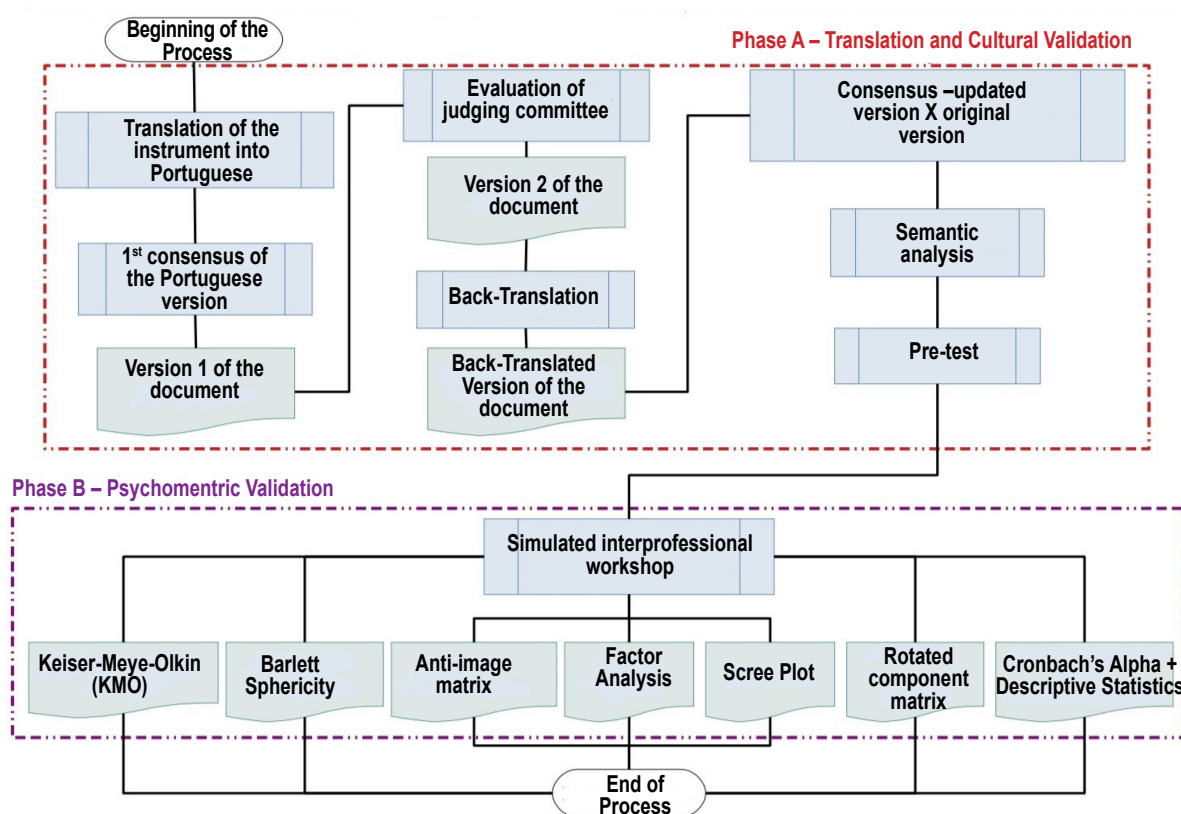
### Study Design

This was a methodological study of the translation, cultural adaptation, and validation of the content and reliability of PACT-Novice instrument, carried out in two phases. Phase A - Translation and cultural validation and Phase B - Instrument validation and reliability (psychometric validation). Phase A was carried out according to the model proposed by Ferrer and colleagues<sup>15</sup>, and already used in other Brazilian studies<sup>16-17</sup>. This model consists of carrying out the following steps: 1) translating the instruments into Portuguese;

2) obtaining the first consensus of the Portuguese version; 3) evaluation by the committee of judges; 4) back-translation; 5) obtaining consensus on the translated version compared to the original version; 6) semantic analysis of the items; and 7) pre-test. Phase B consisted of the application of the instrument in a simulated environment and subsequent statistical analysis of the data through the use of the SPSS program to verify the applicability of the instrument in educational practice.

The methodological design of Phases A and B are represented in Figure 1.

Flowchart of the methods of translation, cultural adaptation, and validation of content and reliability of the instrument.



**Figure 1** – Method of translation, cultural adaptation, and content validation and reliability of the PACT-Novice instrument.

### The “Performance Assessment Tools for Interprofessional Communication and Teamwork (PACT-Novice) scale

The “Performance Assessment Tools for Interprofessional Communication and Teamwork (PACT-Novice)”<sup>13</sup> is a 5-point Likert-type instrument (Bad, Nameless [bad – average], Average, Nameless [average – excellent], Excellent), created to measure and assess behaviors and communication in an interprofessional team during clinical simulation. The instrument was recommended by Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS)<sup>14</sup>, a body that aims to increase patient safety, and improve the quality and efficiency of health care through interprofessional work.

The scale is divided into 5 domains proposed by TeamSTEPPS, namely: Team Structure, Leadership, Situation Monitoring, Mutual Support, and Communication, which are included among the 6 items of the scale<sup>13</sup>. It is aimed at the evaluation of inexperienced teams, such as undergraduates in the health area, and has a specific field for additional comments to be made by the evaluators when desired. The scale<sup>13</sup> is also accompanied by a “Form of Key Terms and Concepts in Team Communication” which aims to facilitate the understanding of some specific items of professional health practice contained in the instrument.

### Phase A–Translation and cultural validation

The translation of the instrument into Portuguese was performed by 3 different translators, to be identified as T1, T2, and T3. All had knowledge of English and Portuguese, as well as mastery of interprofessional work and clinical simulation. Only T1 and T2 knew the objectives of this study. After the translation was completed, the first consensus of the Portuguese version was obtained, through the synthesis of the 3 versions obtained, named V1.

In order to assess the clarity and relevance of the instrument items translated into V1,

its content was independently evaluated by a group of four carefully selected judges (assessment by a committee of judges)<sup>15,18</sup>, who are specialists in the health area, and who use clinical simulation in their teaching activities. The judges classified each item in the instrument as valid or not, using a questionnaire developed by the researchers, enabling the calculation of the Content Validity Index for Items (I-CVI) for each item<sup>18-19</sup>. The judges rated each item between 1 and 4<sup>19-20</sup>, where: 1- not relevant, 2- Partially relevant, 3- Potentially relevant, and 4- Very relevant. Afterwards, to obtain the Index score, the number of scores was divided, from 1 to 4, by the total number of judges. Items with I-CVI equal to 1.0 (100.0%) had their translation kept in the definitive instrument. Items with I-CVI less than 1.0 (100.0%) and greater than or equal to 0.78 (78%) were subject to discussion, and items with I-CVI less than 0.78 (78.0%) would be obligatorily modified<sup>20-21</sup>. A characterization form for the judges was also prepared and sent with information related to the group's expertise.

After analyzing the judges' considerations, the necessary adaptations were made to V1, transforming it into V2. V2 was sent for back-translation, completed by a professional specialist in clinical simulation, native of English and proficient in Portuguese, generating back-translation 1 (BT1). The BT1 was compared to the original English version in search of similarities, differences and cultural adaptations necessary for its compression into Portuguese. Since the instrument was already known by the acronym PACT-Novice, the researchers opted in the translation and back-translation process to keep the acronym in English (PACT) replacing the word “novice” with the word “student”. Thus, the Portuguese version of the instrument was renamed the Work Performance Assessment Scale and Interprofessional Communication of Students in the Context of Simulated Practice (PACT–Students).

Then, a pre-test of the instrument was

carried out, which consisted of its application to a group of five health professionals, doctors and nurses, experts in clinical simulation. The objective of this stage was to obtain any first impressions of the Portuguese version and indications of the adequacy of items to the reality of practice, clarity of questions, uneasiness in filling them out, or doubts caused.

### Phase B - Psychometric validation

For the psychometric validation of the instrument, data collection was carried out during a simulated interprofessional workshop whose theme was "Interprofessional Assistance in Respiratory Emergency". The workshop offered 50 seats and was aimed at medical, nursing, and physical therapy students. The event was publicized and registrations were online. It featured practical skills, followed by interprofessional scenarios. The scenarios were built according to the script proposed by Fabri *et al.*<sup>21</sup>.

Students from the healthcare field (medicine, nursing, and physiotherapy), who carried out all the activities of the workshop, who were over 18 years old, who were at least enrolled in their 2<sup>nd</sup> year of course work were included in the study. 42 students participated in the study.

The number of study participants (42 students) established a ratio of 7 students per

item of the analyzed instrument, which is the smallest acceptable traditional sample - from 7 to 10 participants per item - for the scale analysis to be reliable<sup>22</sup>.

For the reliability analysis, the survey data were coded and entered into Microsoft Excel spreadsheets. After that, a database was created using the Statistical Package for the Social Science (SPSS) version 22.

To determine the validity and reliability of the construct, the following tests were performed: Keiser-Meyer-Olkin (KMO), Bartlett's Sphericity, Anti-Image Matrix, Factor Analysis through Principal Components Analysis, ScreePlot, Rotating Component Matrix, and Cronbach's Alpha. In addition, descriptive statistics were used with measurements of central tendency and dispersion (mean, mode, median, percentiles, variance, standard deviation) to characterize the sample.

### Ethical aspects

The study was reviewed and authorized by the Research Ethics Committee of the Ribeirão Preto College of Nursing - USP, under Opinion No. 2.427.845 (CAAE 10551512.1.0000.5393). As provided for in CNS Resolution 466/2012, both Phase B students and Phase A judges formalized their acceptance by signing the Informed Consent Form (ICF).

## RESULTS

### Phase A - Translation and cultural validation

After the translation process (V1) in order to verify the validity of the items, the instrument was evaluated by a group of four judges. The judges were aged between 30 and 65 years old, had experience and expertise in the areas of clinical simulation and work in an interprofessional team.

The summary of the evaluations, with information from the I-CVI, is shown in Table 1.

**Table 1** – Synthesis of scale items whose I-Content Validity Index (CVI) was lower than 78.0%. Ribeirão Preto, SP, Brazil, 2018.

PACT scale - students	I-CVI< 78%
Team Strategies and Tools to Enhance Performance and Patient Safety (STEPPS)	75.0%
"Form for student observers"	50.0%
Title "novice" / performance. Nomenclature of the scale score	25.0%
Items Team Structure, Leadership, Mutual Support, Monitoring and Communication	25.0%



Table 2 presents a summary of the changes made to the PACT-student from its original version in English to the final version in Portuguese. The

modifications said to be essential for its cultural adaptation and subsequent application are divided according to the domains of the scale.

**Table 2** – Description of the synthesis of modifications of the original instrument PACT – Novice, during the process of translation and cultural adaptation. Ribeirão Preto, SP, Brazil, 2018.

Domain	Original	Translation	Motive
Header	Scene number (in case of sequence) and session (day or night)	Changed the item “Scenario” to just the title of the student scenario and removed the item “Session”	Facilitates completion by the students
Score	“Poor” – “Average” – “Excellent”	Included 2 intermediate scores, totaling five, which are: “Very Bad”, “Poor”, “Average”, “Good”, and “Excellent”	Naming of the previously “empty” points among the three already established facilitates the understanding of the scoring system, as well as avoids confusion while in filling in/ tabulating the data.
“Situation Monitoring” ou “Monitoramento da Situação”	Term “STEP process”	Translated to “STEP mnemonic”, with the inclusion of the meaning of each acronym, being: Patient Status, Team Members, Environmental Elements, and Progress towards the goal.	The inclusion of the meanings of each acronym facilitates the understanding of its application at the time of the scenario
“Mutual Support” ou “Suporte Mútuo”	Terms “Two-Challenge Rule”, “CUS”, and “DESC Script”	Replacement of terms by their meanings, being, respectively: conflict resolution by repeating the instructions, as many times as necessary, until they are carried out; expression, aloud, of concern about the patient and the situation experienced, alerting the team of the seriousness of the case and; manage possible conflicts by clarifying doubts and fears, providing concrete data to the team and making clear what the consequences, positive or negative, of their actions are.	Removing such specific terms from the American context, little known in Brazil, once again facilitates the evaluation of the simulation and the completion of the scale by students.
“Communication” ou “Comunicação”	Terms “SBAR”, “call-out”, “check-backs” and “handoff”	The term “SBAR” was translated as “SBAR mnemonic”, with the inclusion of the meaning of each acronym, which are: 1) Situation (What is happening with the patient?), 2) Background (What is the situation or clinical context?), 3) Assessment (What do you think the problem is?), 4) Recommendation and request (What would I do to fix it?). Replacement of the other terms with their meanings, respectively: Answers or confirms information aloud, using the same terms as the other team member (A “Checking pulses”, B “Checking pulses, 89 bpm”); checks the conduct and information given, repeating the information; Helps other team members carry out their activities, checking if they need help or repeating instructions given.	The removal/replacement of such specific terms from the American context, little known in Brazil, once again facilitates the evaluation of the simulation and the completion of the scale by the students.
Score label	Explanation only of the points “Poor” – “Average” – “Excellent”	New score legend included: “Bad” and “Good”	With the inclusion of two intermediate points, it was necessary to include their meaning in the scale label, in order to facilitate its completion.

Changes to the layout were also suggested (inclusion of the name of the scores in the spaces that were previously blank). After analyzing the judges' evaluations, a second version of the translations (V2) was used for back-translation. After this stage, the final version of the PACT-Students instrument was reached, and then it was evaluated in a pre-test by an interprofessional group of five professionals, with expertise in simulation and health education. At this stage, the CVI index was 95.0% for all items.

### **Phase B - Psychometric validation**

The data collection of phase B included the participation of 42 (100.0%) undergraduate students. Among them, three (7.0%) were medical students, 12 (29.0%) were from the physical therapy course, and 27 (64.0%) were from the nursing course. Regarding gender, most participants, (n=40; 95.0%) were female, with a mean age of 25.2 years old, and a minimum age of 18 years and a maximum of 50 years old. Regarding the course period, among nursing students, four (15.0%) were in their 2<sup>nd</sup> semester, three (11.0%) in their 3<sup>rd</sup> semester, four (15.0%) in their 4<sup>th</sup> semester, seven (26.0%) in their 6<sup>th</sup> semester, seven (26.0%) in their 8<sup>th</sup> semester, and two (7.0%) in their 10<sup>th</sup> semester. Among the medical students, one (33.0%) was in their 7<sup>th</sup> semester, one (33.0%) in their 10<sup>th</sup> semester, and one (33.0%) in their 12<sup>th</sup> semester. In physical therapy, two (16.0%) were in their 2<sup>nd</sup> semester, one (8.0%) in their 4<sup>th</sup> semester, four (35.0%) in their 6<sup>th</sup> semester, three (25.0%) in their 8<sup>th</sup> semester, and two (16.0%) were in their 10<sup>th</sup> semester.

The scale 13 showed good data adequacy, with a ratio of 7:1, with regard to the number of cases and its relationship with the number of variables.

An excellent linear association between

the variables was observed through the correlation matrix, with 100% of the correlations above 0.30. The Keiser-Meyer-Olkin (KMO) sample adequacy test showed good sample adequacy for analysis, with a value of 0.784. Through the Bartlett sphericity test, statistically significant values were obtained with  $X^2 = 145.652$  with  $p < 0.001$ , which indicated, once again, the existence of a sufficiently strong relationship between the variables, suggesting the inclusion of all variables for the factor analysis.

The anti-image matrix, in turn, corroborates the sampling adequacy of each variable for the use of factor analysis, presenting high values on the diagonal from 0.752 (item "Monitoring Situation 1") to 0.817 (item "Structure of the Team"), indicating the consonance of all variables in relation to the study. Thus, as there were no values lower than 0.5, we have evidence of the maintenance of all items in the scale.

To obtain the PACT-Students factors, a factor analysis of the main components was carried out among the 6 items of the instrument, using the main components method. After analyzing and observing the ScreePlot, it was possible to identify the proposed division of the items into only one factor. Thus, the execution of the rotating component matrix was impossible.

Regarding the analysis of the set of items that make up the PACT-Students and their relationship with the construct, through Cronbach's Alpha test (Table 3) to test the proposed items, a high correlation was obtained between all their items as well as each item with the total score of the scale, which resulted in a high Cronbach's Alpha value (0.891). It can also be seen that all items contributed to the good value of Cronbach's Alpha, leaving the scale impaired if any one of them is eliminated.

**Table 3** – Statistics of item homogeneity and Cronbach's Alpha internal consistency coefficients from the Performance Assessment Tools for Interprofessional Communication and Teamwork (PACT-Students). Number of students in the sample = 42. Ribeirão Preto, SP, Brazil, 2018.

PACT-Student Items	Mean	Standard deviation	Fixed total item correlation	Cronbach's Alpha if the item is deleted
Team Structure	3.405	1.0833	0.713	0.872
Leadership	3.357	1.0317	0.739	0.868
Situation Monitoring	2.857	1.0017	0.760	0.865
Mutual Support	3.190	1.1313	0.739	0.868
Communication	3.262	1.2109	0.621	0.889

Due to the impossibility of applying the PACT-Students<sup>13</sup> in an entirely new sample, we considered dividing the sample into two sub-samples (sample A and sample B), obtained by the randomization resource provided by SPSS®. However, the value of the KMO test for the samples proved to be borderline (0.584 for Sample A and 0.553 for

Sample B). Moreover, there was a brutal drop in Cronbach's Alpha value, which resulted in 0.682 for the subdivided samples, a value considered insignificant. Thus, it was decided not to carry out a new test.

Finally, the descriptive and frequency analyses of each item found are described in Table 4.

**Table 4** – Descriptive analysis of the PACT-Students scale items. Ribeirão Preto, SP, Brazil, 2018.

PACT-Student Items	Sample	Minimum	Maximum	Mode	Mean	Standard deviation
Team Structure	42	1.0	5.0	4.0	3.405	1.0833
Leadership	42	1.0	5.0	3.0	3.357	1.0317
Situation Monitoring	42	1.0	5.0	3.0	2.857	1.0017
Mutual Support	42	1.0	5.0	3.0	3.190	1.1313
Communication	42	1.0	5.0	2.0	3.262	1.2109

## DISCUSSION

Interprofessional work, in all its components, contributes to the comprehensive care of the individual, with effective collaboration between professionals through knowledge and respect for the work of each one<sup>23</sup>. Communication is essential for the success and effectiveness of the work of the interprofessional team, and is a skill that can be worked on, practiced and evaluated so that the interaction between team members occurs in an assertive way<sup>11,24,25</sup>.

Specific recommendations for Transforming Education of Health Care Professionals include faculty and curriculum development, simulation methods, direct undergraduate enrollment, admission procedures, streamlined educational pathways and vertical programs, interprofessional education, accreditation, and continuing professional development of health professionals, are suggested to assess the progress of transformative education<sup>25,26</sup>. The-



refore, the use of instruments that assess such recommendations is relevant, such as the PAC-T-Students scale, which showed good psychometric adequacy<sup>13</sup>.

In the process of translation and cultural validation of this instrument, some adaptations were necessary (Table 2) to make it more objective, as in the items scored on the Likert scale and in the stages of development of simulated practices, which have particularities when compared to American<sup>26</sup> and national<sup>21</sup> models. At this stage, suggestions were also made by the experts (Table 1 and Table 2) in order to facilitate the completion of the instrument and its suitability for the technical terms of Brazil. However, the final translated version was positively evaluated by a specialist, successfully fulfilling its objectives in the pre-test.

As for the psychometric validation, the tests showed a high correlation between the instrument's items and a good sample adequacy for the factor analysis.

Regarding the extraction of factors, the tests converged with what was indicated by the original author<sup>13</sup>, keeping the scale with only one factor, in which the six items of the instrument are gathered. Furthermore, the need to exclude any of the items was not demonstrated, with, in fact, a loss of the scale's reliability level in the case of exclusion of one of them. The construct's internal consistency value, Cronbach's Alpha (0.89), was slightly higher than that found by the original author (0.85), indicating the high reliability of the instrument.

Regarding the descriptive analysis of the scale items, understanding the results obtained requires understanding the five pre-established milestones by the already mentioned TeamSTEPPS<sup>14</sup>; that is, Team Structure, Leadership, Situation Monitoring, Mutual Support and Communication.

Team Structure and Leadership are integrated characteristics that refer, in the interprofessional team, to the indication of the role of a leader, so that the student has the opportunity to position themselves as a coordinator of team activities, maintaining the systematization of activities and the centrality of care on the pa-

tient. Therefore, the team is mainly concerned with the relationship that each member establishes with the others and with the product of their care, the patient and/or their family<sup>24,27</sup>, promoting learning about one another, with one another and always focusing on the patient's and/or the family's care.

Situation Monitoring consists of defending the interests of the patient and their family in the discussion of their own case, in addition to resolving conflicts between patient-team and between the team members themselves, working together within the domain of "Communication"<sup>13-14</sup>.

The Mutual Support domain, on the other hand, is comprised of learning from the work of one another, in order to establish a relationship of horizontal trust. When in an emergency, for example, while the leader guides the other team members through the scene, it is the responsibility of the others, among many, to confirm instructions, discuss decisions, and act in accordance with the protocols and guidelines of each specificity; that is, in healthcare work, each one is a unique and integral part of a whole that reflects on the uniqueness of patient care<sup>23-24,28-29</sup>.

Finally, the Communication domain is an integrative process and necessary for the success of the other domains. For this to happen, communication must be effective, preventing ambiguities or misinterpretations, avoiding the performance of actions that may harm the patient and/or his family, whether in the physical, psychological, or spiritual spheres<sup>24,27</sup>.

In this study, the descriptive results demonstrate that students do not experience interprofessional education and, consequently, are not prepared for interprofessional work<sup>23,28-29</sup>, since the domains "Team Structure", "Leadership", "Situation Monitoring", and "Mutual Support" were categorized as "Average" and the domain "Communication" as "Poor".

The inadequate preparation of students from any area of healthcare to work in an interprofessional team can generate conflicts in the work process, as well as loss of potential benefits to patients, which may result from the

deficit in the communication process between members, impairing the overall view of the patient and their surroundings<sup>29-30</sup>. The application of this scale in future studies, in addition to strengthening the evidence found for its use, can contribute to the identification of factors of interprofessional work to be further inves-

tigated, helping to advance health care and strengthen evidence-based practices.

The inability to perform sample randomization at the end can be considered a limiting factor of this study due to the borderline sample size; however, to the participants/item proportion (7:1) was adequate<sup>22</sup>.

## CONCLUSION

The use of instruments aimed at education and interprofessional work that refer to domains such as those suggested by TeamSTEPPS, such as PACT-Students, stimulate evaluation and, as a consequence of their results, changes in the perspectives of training institutions and individual behaviors of professionals and students, which can generate greater safety, quality, and

comfort for patients and their families.

The process of translation and validation of the PACT-Students instrument was efficient, demonstrating a high reliability for its application among students in a simulated context. However, further studies with more representative samples are suggested, reinforcing the results obtained in this study.

**ACKNOWLEDGMENTS:** The Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) for the support granted to Project 17/03651-3, Scientific Initiation Scholarship.

## CRediT author statement

Conceptualization: Machado GCC; Mazzo A. Methodology: Machado GCC; Mazzo A. Validation: Machado GCC; RGS Almeida; Cotta Filho CK; Mazzo A. Statistical analysis: Machado GCC; RGS Almeida; Alves LYM; Mazzo A. Formal analysis: Machado GCC; RGS Almeida; Alves LYM; Cotta Filho CK; Costa RRO; Mazzo A. Investigation: Machado GCC; Mazzo A. Resources: Machado GCC; Cotta Filho CK; Alessandra Mazzo A. Writing-original draft preparation: Machado GCC; Cotta Filho CK; Mazzo A. Writing-review and editing: Machado GCC; RGS Almeida; Costa RRO; Mazzo A. Visualization: Machado GCC; RGS Almeida; Mazzo A. Supervision: Alessandra Mazzo A. Project administration: Machado GCC; Mazzo A.

All authors have read and agreed to the published version of the manuscript.

## REFERENCES

1. Regier DS, Hart TC. Genetics: The Future Is Now with Interprofessional Collaboration. *Dent Clin North Am.* 2016; 60(4):943-949. Available from: doi:10.1016/j.cden.2016.03.005
2. Arruda LDS, Moreira COF. Colaboração interprofissional: um estudo de caso sobre os profissionais do Núcleo de Atenção ao Idoso da Universidade Estadual do Rio de Janeiro (NAI/UERJ), Brasil. *Interface Comun Saúde Educ.* 2017; 22:199-210. doi:10.1590/1807-57622016.061
3. Souza GC, Peduzzi M, Silva JAM, Carvalho BG. Trabalho em equipe de enfermagem: circunscrito à profissão ou colaboração interprofissional? *Rev Esc Enferm USP.* 2016; 50(4):642-649. doi:10.1590/S0080-623420160000500015
4. Souto TDS, Batista SHSDS, Batista NA. A educação interprofissional na formação em Psicologia: olhares de estudantes. *Psicol Ciênc Prof.* 2014; 34(1):32-45. doi: 10.1590/S1414-98932014000100004
5. Peduzzi M, Norman IJ, Germani ACCG, da Silva JAM, de Souza GC. Educação interprofissional: formação de profissionais de saúde para o trabalho em equipe com foco no usuário. *Rev Esc Enferm USP.* 2013; 47(4):977-983. doi: 10.1590/reeusp.v47i4.78051
6. Russell S, More F. Addressing health disparities via coordination of care and interprofessional education: Lesbian, gay, bisexual, and transgender health and oral health care. *Dent Clin North Am.* 2016; 60(4):891-906. doi: 10.1016/j.cden.2016.05.006
7. Foronda C, VanGraafeiland B, Quon R, Davidson P. Handover and transport of critically ill children: An integrative review. *Int J Nurs*

- Stud.2016; 62:207-225. doi: 10.1016/j.ijnurstu.2016.07.020
8. Peterson AA, Carvalho EC. Comunicação terapêutica na Enfermagem: dificuldades para o cuidar de idosos com câncer. *Rev Bras Enferm*. 2011; 64(4):692-7. doi:10.1590/S0034-71672011000400010.
9. Carvalho EC, Bachion MM, Dalri MCB, Jesus CAD. Obstáculos para a implementação do processo de enfermagem no Brasil. *Rev Enferm UFPE on line*. 2007; 1(1):95-9. doi: 10.5205/reuol.17-8781-1-LE.0101200712.
10. World Health Organization. Framework for action on interprofessional education and collaborative practice. Geneva: WHO, 2010. [https://www.who.int/hrh/resources/framework\\_action/en/](https://www.who.int/hrh/resources/framework_action/en/)
11. Orniue MM, Felippa GS. Las prácticas simuladas em la formación de enfermeros. *Rev EnfermHerediana*. 2013; 6(2):115-122. doi: 10.20453/renh.v6i2.1800
12. Herrera CAN, Molina NGV, Becerra JAB. Fortalecimiento de la simulación clínica como herramienta pedagógica en enfermería: experiencia de internado. *Rev Cuid*. 2015; 6(1):970-5. doi: 10.15649/cuidarte.v6i1.161
13. Chiu C, Zierler B, Brock D, Demir G, Taibi D, Scott C. Development and Validation of Performance Assessment Tools for Interprofessional Communication and Teamwork (PACT) Seattle, WA: University of Washington; 2014. ProQuest Dissertations and Theses. [dissertation]. Available from: <http://hdl.handle.net/1773/25364>
14. Fraino J, Sneha B. TeamSTEPS: Team Strategies and Tools to Enhance Performance and Patient Safety. *J Nurs*. 2015; 1(01):11-14. Available from: <http://lawrencepress.com/ojs/index.php/JON/article/view/12>.
15. Ferrer M, Alonso J, Prieto L, Plaza V, Monso E, Marrades R, et al. Validity and reliability of the St George's Respiratory Questionnaire after adaptation to a different language and culture: the Spanish example. *Eur Respir J*. 1996;9(6):1160-6. doi: 10.1183/09031936.96.09061160.
16. Echevarría-Guanilo ME, Rossi LA, Dantas RAS, dos Santos CB. Adaptação transcultural da "Burns Specific Pain Anxiety Scale-BSPAS" para ser aplicada em pacientes queimados brasileiros. *Rev Lat-Am Enferm*. 2006; 14(4):526-533. doi: 10.1590/S0104-11692006000400009.
17. Dantas AAA, Carvalho LG, Ferreira, E. Classificação e tendências climáticas em Lavras, MG. *Ciênc Agrotec*. 2007; 31(6): 1862-66. doi: 10.1590/S1413-70542007000600039
18. Galdeano LE, Rossi LA. Validação de conteúdo diagnóstico: critérios para seleção de expertos. *Ciênc Cuid Saúde (Online)*. 2008; 5(1):060-6. doi: 10.4025/cienccuidsaude.v5i1.5112
19. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health*. 2006; 29(5):489-97. doi: 10.1002/nur.20147.
20. Shrotryia VK, Dhanda U. Content validity of assessment instrument for employee engagement. *Sage Open*, 2019; 9(1):1-7. doi: 10.1177/2158244018821751.
21. Fabri RP, Mazzo A, Martins JCA, Fonseca AS, Pedersoli CE, Miranda FBG, et al. Construção de um roteiro teórico-prático para simulação clínica. *Rev Esc Enferm USP*. 2017; 51:e03218. doi:10.1590/S1980-220X2016016403218.
22. Hair JR, J. F. Multivariate Data Analysis. 7a ed. Upper Saddle River: Prentice Hall. 2010.
23. Casanova IA, Batista NA, Moreno LR. A Educação Interprofissional e a prática compartilhada em programas de residência multiprofissional. *Interface Comun Saúde Educ*. [on line]. 2018. 22(Suppl 1):1325-1337. doi: 10.1590/1807-57622017.0186.
24. Batista NA, Rossit RAS, Batista SHSS, Silva CCB, Uchôa-Figueiredo LR, Poletto PR. Educação interprofissional na formação em Saúde: a experiência da Universidade Federal de São Paulo, campus Baixada Santista, Santos, Brasil. *Interface Comun Saúde Educ*. [on line]. 2018; 22(Suppl 2): 1705-15. doi: 10.1590/1807-57622017.0693.
25. Pan American Health Organization. Interprofessional Education in Health Care: Improving Human Resource Capacity to Achieve Universal Health Report of the Meeting. Bogota, Colombia. 7-9 December, 2016. Available from: <https://iris.paho.org/handle/10665.2/34353>
26. Jeffries PR. A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nurs Educ Perspect*. 2005; 26(2):96-103.
27. Miranda FBG, Mazzo A, Pereira GA Junior. Assessment of individual and interprofessional skills of health professionals in simulated clinical activities: a scoping review. *Interface Comun Saúde Educ*. 2018; 22(67): 1221-34. doi: 10.1590/1807-57622017.0628.
28. Caram CDS, Rezende LC, Brito MJM. Prática colaborativa: potencialidades e desafios para o enfermeiro no contexto hospitalar. *REME Rev Min Enferm*. 2017; 21:e1070. doi: 10.5935/1415-2762.20170080.
29. Paiva LL, Rocha CMF, Pinto LFDS, Cruz AND, Santos DS, Anderle M, et al. Observatório de Saúde Glória/Cruzeiro/Cristal: uma experiência acadêmica e interprofissional em Porto Alegre, RS. Integrando conhecimentos e práticas em saúde: equipes e usuários interagindo na educação pelo trabalho em territórios sanitários. 1a edição. Porto Alegre: Rede Unida. 2017. p176-90.
30. Lennen N, Miller B. Introducing interprofessional education in nursing curricula. *Teach Learn Nurs*. 2017; 12(1): 59-61. doi: 10.1016/j.teln.2016.07.002.

Received in may 2021.  
Accepted in february 2022.