Translation, adaptation and validation of a learning style assessment instrument for pharmacists in Brazil

Tradução, adaptação e validação de um instrumento de avaliação de estilo de aprendizagem para farmacêuticos no Brasil

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ABSTRACT
This study aims to perform the cross-cultural adaptation of the "Pharmacists' Inventory of Learning Styles" (PILS) instrument for its use in Brazil. The process involved five steps: (i) two independent translations, (ii) synthesis of said translations, (iii) back translation, (iv) review by expert committee and (v) pilot study. Discrepancies in the translations were resolved by consensus between the translators. The expert committee reviewed the semantic, idiomatic, conceptual and cultural equivalences between the original and the translated versions,

suggesting changes in ten items (58%), with an agreement mean end of 92.4%. The modified version was rated by 48 people, among which were pharmacy students, residents and pharmacists, who considered it understandable and applicable. The adaptation process was successful, and the use of the instrument as a tool for identifying learning styles is appropriate, which makes it an available resource for continuing education and training practices of pharmaceutical professionals in the country.

Keywords: learning style, pharmaceutical education, questionnaires, translation.

RESUMO
Este estudo tem como objetivo realizar a adaptação transcultural do instrumento "Inventário de Estilos de Aprendizagem de Farmacêuticos" (PILS) para uso no Brasil. O processo envolveu cinco etapas: (i) duas traduções independentes, (ii) síntese das referidas traduções, (iii) retrotradução, (iv) revisão por pares e (v) estudo piloto. As discrepâncias nas traduções foram resolvidas por consenso entre os tradutores. O comitê de especialistas revisou as equivalências semântica, idiomática, conceitual e cultural entre a versão original e a traduzida, sugerindo alterações em dez itens (58%), com concordância média final de 92,4%. A versão modificada foi avaliada por 48 pessoas, incluindo estudantes de farmácia, residentes e farmacêuticos, que a consideraram compreensível e aplicável. O processo de adaptação foi bem-sucedido, e a utilização do instrumento como ferramenta de identificação de estilos de aprendizagem foi adequada, o que o torna um recurso disponível para formação contínua e práticas de capacitação dos profissionais farmacêuticos no país.

Palavras-chave: educação farmacêutica, estilo de aprendizagem, questionários, tradução.

1 INTRODUCTION

Social changes come with a need of readjusting, in modern times, pharmaceutical practices to actions that collaborate with health care, taking on the role of leader in promoting the rational use of medicines. From this perspective, the national curriculum guidelines of the pharmacy course(CONSELHO NACIONAL DE EDUCAÇÃO, 2017) try to break with the previous logic of fragmentation of the formative axis, a dichotomy between theory and practice, evidenced by the temporal division of the basic and the professionalizing cycles and by the focus on learning conceptual knowledge to the detriment of procedural and attitudinal knowledge.

In contrast to this desire for changes in the pharmaceutical education in the country, it is possible to observe a difficult framework of indicators to overcome in pharmacy courses; for example, the little inclusion of students in extracurricular activities, with about 54% of them not being involved in research or extension programs; a large number of courses not graded or given a low grade by the Ministry of Education (INSTITUTO NACIONAL DE ESTUDOS E PESQUISAS EDUCACIONAIS ANÍSIO TEIXEIRA – INEP., 2011) and one of the highest

dropout rates among courses within the health domain(GOMES *et al.*, 2010; UNIVERSIDADE FEDERAL DO PAMPA – UNIPAMPA., 2011).

A part of this framework can be explained by both the distancing of pharmaceutical education from the professional reality and the difficulties inherent to university education, as reported by Machado et al.(GUILHERME *et al.*, 1984) that higher education institutions, in general, continue to offer, as in previous decades, standardized courses, with closed curricula, ineffective teaching methods, minimal facilities limited to classrooms, without considering how diverse the student body is, which contributes to students dropping out(GUILHERME *et al.*, 1984).

In this perspective, new teaching and learning concepts and strategies have been incorporated into teaching in the health domain, which also need to be incorporated to overcome the difficulties in pharmaceutical education. In common, such strategies claim the approach "centered" on the protagonism of the learner, seeking to value the student as an active subject in the teaching process, co-responsible for the (re)construction of knowledge in different learning scenarios(DA SILVA; DELIZOICOV, 2008; ORGANIZACIÓN PANAMERICANA DE LA SALUD, 2003).

There are several theories that propose to explain learning styles, and it is difficult to establish a consensus, as most of them bring concepts and models significantly different from one another(CASSIDY, 2004; PASHLER, 2008; ROMANELLI; BIRD; RYAN, 2009). Despite this, there is a consensus that learning styles do not imply different levels of ability, capacity or intelligence, but rather the preferred way or "style" that each individual has to learn, that is, their particular way of reacting to required tasks and of building knowledge(COFFIELD *et al.*, 2004).

Nevertheless, and even though it is a strategy used in several areas, there are few published studies that have systematically evaluated the learning styles among pharmacy students, even considering the promising applicability of the results of this type of research in pedagogical planning, in educational management and in improving learning outcomes.

Becker(BECKER, 2013) carried out a systematic literature review with studies on learning styles and strategies in the field of Pharmacy. In this work, 17 articles were found that dealt with the assessment or characterization of learning styles of pharmacy students, as well as studies that sought to assess or establish the relationship between academic performance, methodologies or teaching strategies with learning styles. Most studies were carried out in the United States (67%) and none of them were carried out in Brazil. It was verified the use of several instruments with a comprehensive character and, among them, a specific one for

evaluation in the area of pharmaceutical education – Pharmacist's Inventory Learning Style (PILS).

PILS was developed and validated based on Kolb's experiential learning model and Merritt and Marshall's(MERRITT; MARSHALL, [*s. d.*]) construct validity model. The author reports that the instruments for identifying learning styles used in the assessment of pharmacists and pharmacy students were generic, not aimed at pharmacists or health professionals. In addition, some required individuals to speculate about their inner emotions and thoughts, rather than describing specific behaviors under certain circumstances. Thus, such instruments would provide an introduction to theories of learning styles, but they may not be applicable or relevant due to the lack of depth in a specific professional context(AUSTIN, 2004b).

According to Austin(AUSTIN, 2004a), the PILS development process had several phases in order to ensure the integrity of the instrument, and as a result of the work two learning dimensions emerged with greater significance for pharmacists: "doing vs. reflecting" and being in a "structured vs. unstructured environment". The intersection of these two axes produces four quadrants, similar to Kolb's learning styles model, and the crossing of characteristics of these dimensions determines the classification into four learning styles: accommodators (actor), assimilators (producer), convergers (director) and divergers (creator), which can be used to interpret the analysis of styles or for comparison with other studies, given that these terms are more common.

"Doing" people prefer to experiment and learn through trial and error, while "reflecting" people prefer to observe, test mentally, and then try it in practice. Regarding work environment, those in which processes, deadlines and processes are well defined and externally evaluated are called structured environments. Unstructured environments are those in which results, deadlines or processes are not well defined, with performance expectations being individually defined(AUSTIN, 2004a).

PILS can be used as an incentive strategy for discussing teaching and learning(AUSTIN, 2004b), as a guide for the development of curricula and course programs(ENG, 2013), as well as a tool for monitoring changes in learning styles after changes in teaching strategies(LOEWEN *et al.*, 2014; WASIF SYED *et al.*, 2011).

In this sense, and considering the relevance of a learning styles identification tool for pharmacy teaching, this work aimed to translate and cross-culturally adapt the "Pharmacists' Inventory of Learning Styles" (PILS) instrument in order to define, measure and describe the learning styles of pharmacists in Brazil.

2 METHOD

A study of translation and cross-cultural adaptation of the PILS instrument into Brazilian Portuguese was carried out from October 2013 to June 2015. The methodological proposal in this study followed, in general terms, what was recommended by Beaton et al.(BEATON *et al.*, 2000), which comprises the following steps: (i) initial translation, (ii) synthesis of translations, (iii) back translation, (iv) review by expert committee and (v) pilot study.

The items in the English version of the instrument were initially translated into Portuguese by two researchers in the field of education, fluent in English and whose mother tongue is Portuguese. According to the method, one of them was informed of the goals and concepts underlying the study (informed translator), while the other was not aware of such concepts (lay translator). The two translations (T1 and T2) were compared and ambiguities or discrepancies in the translated words were resolved by consensus (synthesis version T3).

The T3 version in Portuguese was translated into the original language (English) by two other bilingual translators born and literate in an English-speaking country, both of which had linguistic and cultural domain of the original language as well as the Portuguese language. The translators did not receive information regarding the goals and concepts underlying the study to avoid translation biases at this stage. The two back translations (RT1 and RT2) were compared and ambiguities or discrepancies were resolved by consensus.

Next, two committees of judges were formed to compare the original and the translated versions, to evaluate the items according to semantic, idiomatic, **cultural** and conceptual equivalences. For the analysis of the evaluated equivalences, two specific evaluation sheets were used: "Evaluation of Semantic and Idiomatic Equivalences" and "Evaluation of Cultural and Conceptual Equivalences", **duly adapted for the study based on the models created by Lino**(LINO, MM, 1998)**.**

To assess the semantic and idiomatic equivalences, the committee of judges "A" was formed by five researchers who are experts in the field of pharmaceutical education, proficient in English and who were selected for convenience. Participating judges were instructed to document in an evaluation sheet the reason for the proposed changes.

This committee assessed the semantic and idiomatic equivalences through the specific sheet using an equivalence scale with three options: -1 (not equivalent), 0 (undecided) and +1 (equivalent). For options -1 or 0, the judges were invited to suggest the changes they deemed appropriate to obtain equivalence for the item.

After the analyses, the changes suggested by the judges were carried out, being accepted as equivalents the items that had at least 80% of agreement among the evaluators. To obtain the degree of agreement among the experts, the percentage of agreement method was used, according to the formula described below.

% agreement = number of participants that agree x 100
            total number of participants

Items that had less than 80% agreement were reformulated based on the evaluators' suggestions and sent back for a new round of evaluation of the semantic and idiomatic equivalences. The version generated after completion of this step was sent for evaluation of cultural and conceptual equivalences by a new group of experts.

The committee of judges "B" was formed by Pharmacy and English language proficiency professors to assess cultural and conceptual equivalences between the original and the translated versions. The analyses of this step were also performed using the percentage of agreement. Items that had less than 80% agreement were reformulated and resubmitted for expert evaluation. At the end of these steps, the pre-final version of the instrument was generated, entitled "Questionnaire for the Identification of Learning Styles of Pharmacists".

To test the applicability of the questionnaire, a pilot study was carried out with a sample of 50 participants distributed among pharmacy students of the Federal University of Sergipe, resident pharmacists of the University Hospital of the Federal University of Sergipe (HU-UFS) and pharmacists working in different practice scenarios in the country.

The individuals were invited to participate in the pilot study and those who accepted the invitation received printed material containing a sample characterization form and the Questionnaire for the Identification of Learning Styles of Pharmacists, as well as guidance on the use of the response scale and how to fill out the instrument. The option "unclear item" was added to each item of the instrument, which should be checked if the item in question was not easily understood. In this case, the participants were instructed to point out their criticisms and suggestions regarding the content of the inappropriate items.

The questions with more than 15% of respondents being doubtful or not understanding the meaning of the statement were reviewed by the expert committee and resubmitted to other respondents(CICONELLI, 1999). At the end of this step, the final version of the instrument was generated.

Authorization for the PILS cross-cultural adaptation process was obtained by email from the author himself, PhD Zubin Austin from the University of Toronto, Canada. Participants at all stages were instructed regarding the study and agreed to participate by signing an Informed Consent Form. The research project was approved by the Research Ethics Committee of the Federal University of Sergipe (CEP-UFS) under report No. CAAE 26380414.5.0000.5546, in accordance with Resolution No. 466/2012 of the National Health Council (CNS). Also in accordance with this resolution, research participants were assured of the benefits resulting from the project, being forwarded to them all the results of their learning styles analyses(BRASIL. CONSELHO NACIONAL DE SAÚDE, 2012).

In both the translation and back translation phases, the contacted professionals were paid for their translation services, as per their requirement. Thus, for their participation in the study, they were considered service providers, and not research subjects, given that according to CNS Resolution No. 466/2012, the participation of research subjects must be free and without economic biases that could affect their consent adherence to the research(BRASIL. CONSELHO NACIONAL DE SAÚDE, 2012).

3 RESULTS

In the first stage of the cross-cultural adaptation process, the ***initial translation***, the original version (in English) of the PILS was translated by two independent Brazilian translators, with a broad domain of the English language. The two initial translations (T1 and T2), in general, did not present any great translation differences.

A divergence that should be highlighted between the two translated versions was the inclusion, in the T2 version, of words in the female gender, inserted in parentheses after the terms that vary according to the reader's gender (female or male).

From the two translations, an initial synthesis version was prepared for discussion with the two translators. During this stage, disagreements arose among the translators related to item 4: "*I like to take notes, or write things down as I'm going along*". However, after discussion, the term "take notes" was considered to encompass the entire meaning of the original item. It is noteworthy that in the preparation of the final T3 synthesis version, both the semantic construction of the sentences of each item and the clarity of the words used were considered.

In the next stage of the PILS adaptation, the ***back translation***, the T3 version was translated back into English by two other translators, here referred to as back translators, also independently, in order to verify whether the Brazilian version contained gross errors or

translation inconsistencies capable of making its content different from the original version, which did not happen.

Once the back translation stage was completed, without changes to the instrument, the questionnaire was <u>forwarded</u> to the evaluation stage by two committees of expert judges, an "A" committee responsible for evaluating the ***semantic and idiomatic equivalences***, and a "B" committee responsible for assessing the ***cultural and conceptual equivalences*** of PILS.

In the first round of evaluation of the semantic and idiomatic equivalences, 22.2% (n = 4) of the items had less than 80% of agreement between the evaluators, namely: items 1, 3, 4 and 12. Thus, a new version was elaborated from the suggestions and sent to the judges again for a second round of evaluation. In item 4, the committee recommended that the excluded sentence be reincorporated into the translated version. That way, the item's description changed from "*Eu gosto de fazer anotações*" to "*Eu gosto de fazer anotações ou escrever coisas enquanto estou acompanhando*". In items 11 and 16, despite the agreement of 80% by the judges, pertinent changes were suggested and accepted by the researchers. The other changes were related to grammatical corrections and the reordering of words in the sentence, in order to make them more understandable.

After the second round of evaluation of the semantic and idiomatic equivalences, 55.5% of the items (n = 10) were in full agreement by the judges (100%), and the other 45.4% (n = 8) had 80% of agreement, being forwarded, then, to committee B, for the evaluation of the cultural and conceptual equivalences.

The committee of judges B was composed of six professors from the pharmacy course, with at least one from each Brazilian geographic region, aiming to detect the use of regionalisms and the understanding of the instrument by students and pharmacists residing throughout the country(BORSA, 2014). The judges assessed cultural and conceptual equivalences using the same equivalence scale as committee A.

At this stage, five items (2, 4, 6, 7 and 13) obtained less than 80% of agreement by the judges and changes considered relevant were suggested in two other items (3 and 10).

For items 2, 3 and 6, the judges suggested replacing the terms *"primeiramente", "por conta própria"* and *"normalmente"* by others more commonly used in everyday life such as "*primeiro*", "*sozinho*" and "*geralmente*". Regarding item 6, which had the least percentage of agreement among the judges (33.3%), it was suggested to change the term "*só para saber se estou acompanhando*" by another term more appropriate to the expression "*keeping up*" in the context of questionnaire. That way, the item was changed to "Eu *geralmente* me comparo a outras pessoas só para saber se estou *no mesmo nível"*. In items 4 and 7, two judges suggested

modifying the terms "*enquanto estou acompanhando*" and "*mais de perto*", as they were not clear. For item 10, it was recommended a grammatical change in regards to adequacy, since the correct expression would be "*prestar* atenção a algo" and not "em algo".

Item 13 obtained 66.6% of agreement regarding its cultural and conceptual equivalence, since the term "agradar" can have different meanings in this context. It was then evaluated that the expression "mostrar gratidão" would be more appropriate to the situation in question. Thus, these items were modified and sent back to Committee B experts for a second round of cultural and conceptual equivalences evaluation.

In the second round, except for item 7, all others items obtained 100% of agreement. In regards to item 7, one of the judges was undecided as to its conceptual equivalence and suggested the inclusion of the term "de uma vez", instead of "de vez". The suggestion was accepted.

Committee B was also questioned about the name of the instrument in Portuguese. Only two judges (33.3%) considered the title "Inventário de Estilos de Aprendizagem de Farmacêuticos" culturally equivalent. Two other judges reported that the term "inventário" meaning "description, relationship" would not be a common term in Brazil. Thus, the name of the instrument was changed to "Questionário de Identificação de Estilos de Aprendizagem de Farmacêuticos" (Questionnaire for the Identification of Learning Styles of Pharmacists) and submitted to the second round of evaluation by this committee, obtaining 100% of agreement among the judges.

After completing the cultural and conceptual equivalences assessment stage, the pre-final version of the adapted instrument was obtained and submitted to a pilot study with undergraduate students, residents and pharmacists, with the purpose of correcting inconsistencies in meaning, detecting errors and confirming its comprehension by the end user(BEATON *et al.*, 2000; GASPARINO; DE BRITO GUIRARDELLO, 2009; LINO, Valéria Teresa Saraiva *et al.*, 2008).

Chart 01 - Learning Styles Identification Questionnaire for Pharmacists - PILS (Final Version). Source: AUTHOR, 2015.

Pense sobre algumas situações recentes nas quais você teve que aprender algo novo para resolver um problema. Estas podem ser qualquer tipo de situação: enquanto você estava na universidade realizando um experimento ou resolvendo um caso clínico ou quando estava aprendendo a usar um celular novo ou tentando descobrir como montar um móvel.

Agora, circule a letra na coluna que caracteriza o que melhor funciona para você em situações como aquelas em que você havia pensado.

Quando eu estou tentando aprender algo novo...	Frequentemente	Às vezes	Raramente	Dificilmente
1 Eu prefiro observar os outros antes de tentar praticar sozinho (a).	B	D	C	A
2 Eu gosto de consultar primeiro um manual, livro ou um guia de instrução.	B	C	D	A
3 Eu prefiro trabalhar sozinho (a), ao invés de trabalhar com outras pessoas.	A	C	B	D
4 Eu gosto de fazer anotações ou escrever coisas enquanto estou aprendendo.	B	C	D	A
5 Eu sou critico (a) comigo mesmo (a), se as coisas não funcionarem da maneira que eu esperava.	B	C	D	A
6 Eu geralmente me comparo a outras pessoas só para saber se estou no mesmo nível.	B	D	C	A
7 Eu gosto de examinar as coisas cuidadosamente ao invés de encará-las de uma vez.	B	D	C	A
8 Eu produzo mais quando estou sob pressão.	C	A	B	D
9 Eu gosto de ter bastante tempo para pensar antes de tentar algo novo.	D	B	C	A
10 Eu presto bastante atenção aos detalhes.	B	C	A	D
11 Eu me concentro em melhorar as coisas que fiz errado no passado.	C	A	D	B
12 Eu foco em reforçar as coisas que fiz certo no passado.	B	D	A	C
13 Eu gosto de mostrar gratidão à pessoa que está me ensinando.	D	B	A	C
14 Eu confio na minha intuição.	D	C	A	B
15 Em um grupo, eu sou normalmente o (a) primeiro (a) a terminar qualquer atividade que estivermos fazendo.	A	C	D	B
16 Eu gosto de assumir o controle da situação.	C	A	B	D
17 Eu sou bem organizado (a).	B	A	C	D

A = _____   B = _____   C = _____   D = _____

Estilo dominante: _____

Estilo secundário: _____

Chart 02 - Results and analysis guidelines for the PILS questionnaire (Final Version). Source: AUTHOR, 2017.

A = FARMACEUTICO ATOR
Você adora lidar diretamente com as pessoas e possui pouco tempo ou paciência para lidar com trabalhos de abordagem indireta. Você gosta de procurar e explorar as oportunidades tão logo elas se apresentem e tem um espírito empreendedor. Você aprende melhor com a prática, de maneira livre, não em um modelo tradicional de aula. Apesar de não obter prazer algum em liderar outras pessoas, você o faz, pois se considera o mais capacitado para fazê-lo. É confiante, tem opiniões fortes e valoriza eficiência. Você se preocupa com o tempo e gosta de ver um trabalho ser terminado. Às vezes, no entanto, sua preocupação com eficiência indica que a qualidade do seu trabalho pode ser prejudicada e que você pode não estar prestando tanta atenção aos desejos e sentimentos dos outros como deveria.
* Pode ter facilidade de aprendizagem em práticas de dispensação e cuidado farmacêutico simuladas, além de atividades de educação em saúde por exemplo.
B = FARMACEUTICO PRODUTOR
Você geralmente prefere trabalhar sozinho, ao seu próprio passo e em seu próprio tempo, ou com um grupo pequeno de pessoas como você. Você tende a evitar situações onde seja o centro das atenções ou constantemente observado – você prefere ser aquele que observa e aprende através dos outros. Você tem habilidade em aprender

com os seus erros e com erros os dos outros. Você prioriza fazer as coisas corretamente, de acordo com as regras, mas às vezes você pode ser seu pior crítico. Você valoriza organização e atenção aos detalhes.
* Pode ter facilidade em atividades de regulação e inspeção de vigilância sanitária, atividades práticas de pesquisa, produção de medicamentos e controle de qualidade.
C = FARMACÊUTICO DIRETOR
Você é focado, prático e vai direto ao ponto. Você costuma encontrar-se em um papel de liderança e gosta desse desafio. Você tem pouco tempo ou paciência para aqueles que hesitam, são indecisos ou passam muito tempo em assuntos teóricos ou não-práticos. Você é bom em chegar a conclusões rápidas e decisivas, mas reconhece que às vezes sua velocidade pode levar a resultados abaixo do esperado. Você preferiria ter um bom trabalho feito em seu tempo que um excelente trabalho entregue com atraso. Você gosta de estar em ambientes de alto desempenho e energia, em ritmo acelerado.
* Pode ter facilidade em atividades de ensino baseado em projetos, atividades de que preparem para a gestão empresas farmacêuticas ou para a gestão da assistência farmacêutica em sistemas de saúde por exemplo.
D= FARMACÊUTICO CRIADOR
Você gosta de estar em ambientes não convencionais, inovadores, onde o tempo e os recursos não são particularmente restritos. Tem um dom de manter as pessoas entretidas e envolvidas e acredita sinceramente que este é o caminho para motivar os outros e tirar melhor proveito de todos. Você é muito preocupado - às vezes preocupado demais - sobre como os outros percebem você e coloca como prioridade a harmonia. Você encontra pouca dificuldade em lidar com situações teóricas, ambíguas e complexas (desde que não haja muita pressão para realizá-las), mas às vezes tem dificuldade em lidar com questões práticas do dia-a-dia.
Pode ter facilidade com atividades de extensão universitária e atividades de ensino que envolvem a implantação de serviços farmacêuticos, ações de educação em saúde ou condução de grupos terapêuticos por exemplo.
Agora, como um grupo de indivíduos com o mesmo estilo de aprendizagem dominante, pensem nas seguintes perguntas e compartilhem suas opiniões:
PÓS ANÁLISE:
1) Quais são as características profissionais, sociais ou pessoais que vocês têm em comum?
2) Quais os métodos de ensino-aprendizagem funcionam melhor para vocês?
3) Quais métodos de ensino-aprendizagem não funcionam para vocês?
4) Dê alguns exemplos do tipo de feedback que motiva vocês.
5) Dê alguns exemplos do tipo de feedback que desanima vocês.
Agora, compartilhe a discussão de seu grupo com membros de outros grupos de estilos de aprendizagem.

Thus, the instrument was applied to 50 people. Two people did not complete their questionnaires and their sheets were excluded from the study. Most participants were female (66.6%), aged between 20 and 30 years (62.5%), with a mean age of 28.4 years (SD = ±5.0). Among the participants, 60.5% were pharmacists (n=29), 27% were undergraduate pharmacy students (n=13) and 12.5% were resident pharmacists (n=6).

The instrument was considered easy to understand and complete by the participants, which indicated that the adjustments made were satisfactory. There were only two highlights in the "unclear item" field. One respondent considered that item 12: "Eu foco em reforçar as coisas que fiz certo no passado" was not clear, but did not register any suggestions.

Another respondent highlighted item 13, "Eu gosto de mostrar gratidão à pessoa que está me ensinando", and commented that the situation would not apply to the learning context, but this is considered an important characteristic of divergers. Thus, the two items were kept without changes.

It is important to emphasize that none of the 17 items that compose the instrument were highlighted by more than 15% of respondents regarding its clarity. Thus, the pilot study phase

was completed and the final version of the instrument (Chart 1) and its answers (Chart 2) were validated.

In the characterization of learning styles, it was found that 50% of respondents (n=24) were dominantly assimilators, followed by convergers (35.4%; n=17) and divergers (25%; n=12)). It is noteworthy that five people had a predominant majority in two styles (assimilator-converger=1; assimilator-diverger=3; converger-diverger=1). Among the secondary styles, there was no predominance of one style: 35.4% (n=17) were identified as convergers, 33.3% (n=16) as assimilators and 31.2% (n=15) as divergers. Accommodators only appeared in the sample as a secondary style, present in only 14.5% (n=7) of the pilot study participants.

4 DISCUSSION

The translation and adaptation process happened as expected, with rigorous analysis by different experts during the different stages and with a high level of final agreement regarding the final expressions. This result is relevant because the scarcity of studies and appropriate methodologies in the processes of transcultural translation into Portuguese has been a barrier both in the use of instruments for education and for the health domain (FORTES; ARAÚJO, 2019; KNIHS; SCHIRMER; ROZA, 2014; TOLEDO JÚNIOR; DUCA; COURY, 2018).

As stated by Austin(AUSTIN, 2004a), the PILS is considered an adequate instrument, with considerable validity and reliability for use in the context of pharmaceutical education with the purpose of stimulating discussion and reflection on teaching and learning styles.

During the synthesis of the translations, the inclusion of the female variable was evaluated, and it was decided to use the terminology "(a)" in the final version of the questionnaire, from a perspective of gender equality, a fundamental matter inserted in the theme of Human Rights, with the aim of bringing visibility to the role of the female gender as a political subject, stressing that this practice is one of the contemporary ways of facing discrimination against women(CALDAS-COULTHARD, 2007).

As an example of a national initiative to promote this linguistic inclusion, we shine a light on "The Manual for the Non-Sexist Use of Language", which aims to prevent sexism in language and guarantee, for men and women, the same rights and access to opportunities(GOVERNO DO ESTADO DO RIO GRANDE DO SUL. SECRETARIA DE POLÍTICAS PARA AS MULHERES, 2014). In addition, in 1996, UNESCO launched the publication: "Writing without discrimination: UNESCO's non-sexist language with examples in Portuguese, English and Spanish"(UNESCO., 1996).

Although the characterization of learning styles is not the primary objective of this study, the data found in the pre-test are similar to studies that used the PILS instrument to identify learning styles. Austin(AUSTIN, 2004a) evaluated 166 Canadian pharmacists: 33.7% were identified as assimilators, 32.5% as convergers, 21.1% as divergers and 12.1% as accommodators. Other studies(CRAWFORD; ALHREISH; POPOVICH, 2012; LOEWEN; JELESCU-BODOS, 2013) developed with pharmacy students, resident pharmacists, professors and preceptors of pharmacy courses found similar results, verifying a majority of assimilators and convergers.

Many studies attest that learning is facilitated if pedagogical strategies are in accordance with the student's learning styles, making the learning process more effective, and considerably improving student performance, as pointed out by Kinshuk et al.(KINSHUK; LIU; GRAF, 2009) and Graf et al.(GRAF *et al.*, 2009).

As demonstrated in different studies, PILS can be used to identify learning styles); in the comparison between styles and career choice(AUSTIN, 2004b), in the comparison between styles of students and professors or preceptors(CRAWFORD; ALHREISH; POPOVICH, 2012; LOEWEN; JELESCU-BODOS, 2013); in the positive incentive in the educational environment of teaching pharmacy(ENG, 2013); in evaluating changes in learning style after the introduction of different teaching strategies, such as Problem Based Learning – PBL(WASIF SYED *et al.*, 2011); and in evaluating the impact of residency programs on learning styles(LOEWEN *et al.*, 2014).

From this study, it is possible to characterize the learning styles in the field of pharmaceutical education using the Brazilian version of the PILS instrument resulting from the process of translation and cross-cultural adaptation.

In addition, the Portuguese version of this instrument can contribute to comparative studies with other countries, given that the PILS was used in studies in Canada(AUSTIN, 2004a, b; LOEWEN *et al.*, 2014; LOEWEN; JELESCU-BODOS, 2013), the United States(CRAWFORD; ALHREISH; POPOVICH, 2012), Malaysia(WASIF SYED *et al.*, 2011) and Sweden(WALLMAN *et al.*, 2009) and that its use has expanded after the Accreditation Council for Pharmacy Education's recommendation.

5 FINAL CONSIDERATIONS

The process of translation and cross-cultural adaptation developed was considered satisfactory both due to the success in the proposed steps and in the implementation of the pilot study.

In the development of this work, important cultural adaptations were made, such as the alteration of expressions and slang in order to become more comprehensible to the Brazilian public as well as the use of non-sexist and gender affirmative language.

The researchers understand that the study resulted in an instrument applicable to the analysis of learning styles in the context of Brazilian pharmaceutical education. However, there is a need for studies that implement the instrument on a larger scale as well as define strategies for its use in the teaching-learning process.

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