Esc Anna Nery 2024;28:e20240053

RESEARCH

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Translation to Brazilian Portuguese and content validity of the Theoretical Domains Framework

Tradução para o português do Brasil e validação de conteúdo da Theoretical Domains Framework

Traducción al portugués brasileño y validación de contenido del Theoretical Domains Framework

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Abstract

Objective: to translate and cross-culturally adapt the Theoretical Domains Framework (TDF) for Brazilian Portuguese. **Method:** this was a methodological study on translation and cross-cultural content validity, conducted from January 2021 to July 2022, in four stages: (I) initial translations; (II) translation synthesis; (III) back-translations, and (IV) assessment by an expert committee. The Content Validity Index (CVI) was calculated for each item and for the instrument as a whole, with validity set at a CVI of 80% or higher and a Cronbach's alpha coefficient of 0.70 or higher. **Results:** after analysis by a committee of five experts, semantic, idiomatic, experiential, and conceptual equivalences were achieved, resulting in the Brazilian pre-final version of the TDF. The theoretical framework achieved an overall CVI of 96.6% and internal consistency, as measured by Cronbach's alpha, of 0.916. **Conclusion and implications for practice:** the TDF was translated and culturally adapted to Brazilian Portuguese, with CVI and internal consistency values considered satisfactory. The use of the TDF can help identify cognitive, affective, social, and environmental influences on behavior, aiding in the knowledge translation process.

Keywords: Health Care Professionals; Implementation Science; Nursing; Translation; Validation Studies.

Resumo

Objetivo: realizar a tradução e adaptação transcultural da estrutura teórica *Theoretical Domains Framework* (TDF) para o português brasileiro. **Método:** estudo metodológico de tradução e validação de conteúdo transcultural, realizado de janeiro de 2021 a julho de 2022, em quatro etapas: (I) traduções iniciais; (II) síntese das traduções; (III) retrotraduções; e (IV) avaliação por comitê de especialistas. Foi calculado o Índice de Validade de Conteúdo (IVC) para cada item e para o instrumento como um todo, sendo considerado validado um IVC igual ou superior a 80% e um coeficiente alfa de Cronbach maior ou igual a 0,70. **Resultados:** após a análise do comitê composto por cinco especialistas, foram obtidas as equivalências semântica, idiomática, experimental e conceitual, resultando na versão pré-final brasileira da TDF. A estrutura teórica alcançou um IVC total de 96,6% e uma consistência interna, medida pelo alfa de Cronbach, de 0,916. **Conclusão e implicações para a prática:** a TDF foi traduzida e adaptada culturalmente para o português brasileiro, com valores de IVC e consistência interna considerados satisfatórios. A utilização da TDF pode identificar influências cognitivas, afetivas, sociais e ambientais no comportamento, auxiliando no processo de translação do conhecimento.

Palavras-chave: Ciência da Implementação; Enfermagem; Estudo de Validação; Profissionais da Saúde; Tradução.

Resumen

Objetivo: realizar la traducción y adaptación transcultural del marco teórico *Theoretical Domains Framework* (TDF) al portugués brasileño. **Método:** estudio metodológico de traducción y validación de contenido transcultural, realizado desde enero de 2021 hasta julio de 2022, en cuatro etapas: (I) traducciones iniciales; (II) síntesis de las traducciones; (III) retrotraducciones; y (IV) evaluación por un comité de expertos. Se calculó el Índice de Validez de Contenido (IVC) para cada ítem y para el instrumento en su totalidad, considerándose validado un IVC igual o superior al 80% y un coeficiente alfa de Cronbach mayor o igual a 0,70. **Resultados:** tras el análisis del comité compuesto por cinco expertos, se obtuvieron las equivalencias semántica, idiomática, experimental y conceptual, resultando en la versión pre-final brasileña del TDF. El marco teórico alcanzó un IVC total del 96,6% y una consistencia interna, medida mediante el alfa de Cronbach, de 0,916. **Conclusión e implicaciones para la práctica:** el TDF fue traducido y adaptado culturalmente al portugués brasileño, con valores de IVC y consistencia interna considerados satisfactorios. El uso del TDF puede identificar influencias cognitivas, afectivas, sociales y ambientales en el comportamiento, contribuyendo al proceso de traducción del conocimiento.

Palabras clave: Ciencia de la Implementación; Enfermería; Estudio de Validación; Profesionales de la Salud; Traducción.

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Submitted on 08/16/2024.
Accepted on 12/05/2024.

DOI:https://doi.org/10.1590/2177-9465-EAN-2024-0053en

INTRODUCTION

Incorporating new scientific evidence to improve healthcare practices requires a change in healthcare professionals' behavior. However, behavioral change can be a difficult and complex process, and incorporating new research findings into daily healthcare can sometimes be challenging. Some barriers are cited as possible causes of this difficulty in changing team behavior in healthcare systems, and they can be categorized as organizational, social, and individual. Such barriers can affect the implementation of new evidence-based practices.[1-7]

Social and organizational barriers are called external, as they refer to factors, resources or processes that are external to individuals. Individual barriers are categorized as internal, as they refer to personal characteristics, attitudes and skills. In practical terms, organizational barriers include aspects of financial remuneration, lack of time, resources or equipment; social barriers refer to interprofessional relationships and patient characteristics; and individual barriers include professionals' lack of knowledge, resistance, disinterest and work overload. Barriers can arise at any stage of the implementation of scientific evidence. Therefore, before putting evidence into practice, one must be aware of them and plan strategies for a more effective result.[6-10]

Concerning the implementation of new evidence in nursing practice, organizational culture should be considered in this process, since it exerts a positive or negative influence on care environments and on the role of leaders and managers in proposing changes. Furthermore, establishing effective relationships and communication between leaders and subordinates can be a facilitating element for behavioral change in nursing teams.[11,12]

In this context, implementation science aims to structure the translation process of scientific evidence into practice, based on the identification of facilitators and barriers in different scenarios, as well as the development of strategies to overcome them, which includes considering the change in healthcare professionals' behavior and its determinants, as these influence the results of an implementation. Thus, theories, models and structures were proposed to understand phenomena that contribute to the success of implementation, among which, in this study, the theoretical structure called Theoretical Domains Framework (TFD) stands out. It is a theoretical framework constructed by the synthesis of 128 theoretical constructs from 33 theories of behavior and behavior change to identify barriers and facilitators in healthcare professionals' behavior related to the implementation of scientific evidence in practice.[2,5,10,13-15]

Internationally, the TDF has been widely used to understand barriers and facilitators for implementing health interventions and practices in different spheres and contexts. Research sought to understand the challenges and facilitators for implementing innovations in nursing. Participating nurses pointed out the domains "social influences", "behavioral regulation" and "knowledge" as barriers, while "intentions", "reinforcement" and "rewards" were seen as facilitators for adopting innovations.[16]

Another research, a scoping review, used the TDF to map barriers and facilitators that influence the implementation of annual health assessments for people with intellectual disabilities by primary care providers. Key barriers identified included lack of awareness of the benefits of assessments, inadequate training, lack of time, and provider burnout.[17]

A third study conducted bibliometric analysis to summarize the development and trends in TDF research between 2005 and 2023. This study revealed the United Kingdom as the leading contributor to TDF research, highlighting topics such as cancer and stroke. Emerging topics included abuse, violence, maternal health, antenatal care, and patient engagement.[18]

Finally, the study used the TDF to investigate barriers and facilitators in pediatric pressure injury prevention in hospitals, considering the practices of nurses and other healthcare professionals. In the "skills" and "knowledge" domains, the main barriers identified were the lack of confidence of professionals to manage pediatric injuries and the lack of specific training on pediatric issues.[19]

Although the TDF is widely used in international studies to promote behavior changes in clinical practice, there is a significant gap in Brazilian studies that explore its application in nursing, with no national studies that used this framework to understand barriers and facilitators in the implementation of health practices in Brazil. National studies conducted with the TDF could contribute to implementing evidence-based practices (EBP) in nursing, supporting more effective strategies for implementing health interventions aimed at changing professionals' behaviors in Brazil.

The TDF represents a valuable tool for implementing EBP, as it allows the identification and understanding of behaviors and beliefs that act as barriers to adopt the recommended clinical practices. By using the TDF, it is possible not only to map the challenges faced by nurses in practice, but also to develop targeted intervention plans capable of modifying these barriers and, thus, promoting a significant evolution in clinical practice. Thus, the present study proves to be relevant in providing support for practical transformations, directly contributing to strengthening EBP and improving healthcare in Brazil.

Considering the importance of changing healthcare professionals' behavior to incorporate new scientific evidence into clinical practice and the validity of an instrument that can highlight the barriers that hinder the implementation science process in different contexts, this research aimed to translate and cross-culturally adapt the TDF theoretical framework into Brazilian Portuguese.

METHOD

This is a methodological study of translation and cross-cultural adaptation of the TDF into Brazilian Portuguese, carried out from January 2021 to July 2022.

The first original version of the TDF was developed in 2005 and consisted of 12 theoretical domains. Later, in 2012, a new version of the theoretical structure was validated and began to integrate 14 domains relevant to the assessment of barriers to behavior change among healthcare professionals, classified as: (1) knowledge; (2) skills; (3) social/professional role and identity; (4) beliefs about

capabilities; (5) optimism; (6) beliefs about consequences; (7) reinforcement; (8) intentions; (9) goals; (10) memory, attention and decision process; (11) environmental context and resources; (12) social influences; (13) emotion; and (14) behavioral regulation.[15]

To carry out this study, the method proposed by Beaton was used, consisting of four stages: (I) initial translations; (II) translation synthesis; (III) back-translations; (IV) assessment by an expert committee, described below and represented by Figure 1.[20]

I. Initial translations: two native English-speaking translators participated, both resident in Brazil and nursing professionals. Translator T1 had prior knowledge of the study objective and the TDF constructs, while translator T2 was unfamiliar with the instrument and was not informed about the study, as recommended by the method proposed by Beaton. At this stage, the TDF theoretical framework was translated from English to Brazilian Portuguese, resulting in versions named T1 and T2.[20]
II. Translation synthesis: a member of the research team, a nursing professional and fluent in English, carried out this stage by analyzing and comparing versions T1 and T2, resulting in a consensual version called synthesis version T12.
III. Back-translations: this stage was carried out by hiring two translators who were native English speakers and fluent in Portuguese. Neither translator had any training in the health field, nor were they familiar with the original version of the theoretical framework. After hiring the service, the document with the summary version T12 was sent separately by email to each of the translators, and a deadline of one week was set for the delivery of the back-translation versions (BT1 and BT2) in English. The authors of the original TDF were consulted regarding the synthesis version, which was sent by email for their consideration.
IV. Assessment by expert committee: five professionals holding doctoral degrees, with clinical and academic experience, and advanced knowledge of both languages were invited to compose the committee. After the invitation and acceptance by experts, four files were shared by email: (1) a form to be completed via Google Forms, containing demographic variables to characterize the committee members (age, profession, time since graduation, and current area of professional activity), in addition to all domains and constructs of version T12, to be assessed in relation to semantic, idiomatic, cultural, and conceptual equivalences; (2) Informed Consent Form (ICF); (3) version T12; (4) a comparative chart between versions T1, T2, T12, BT1, and BT2 to assist in the assessment process.

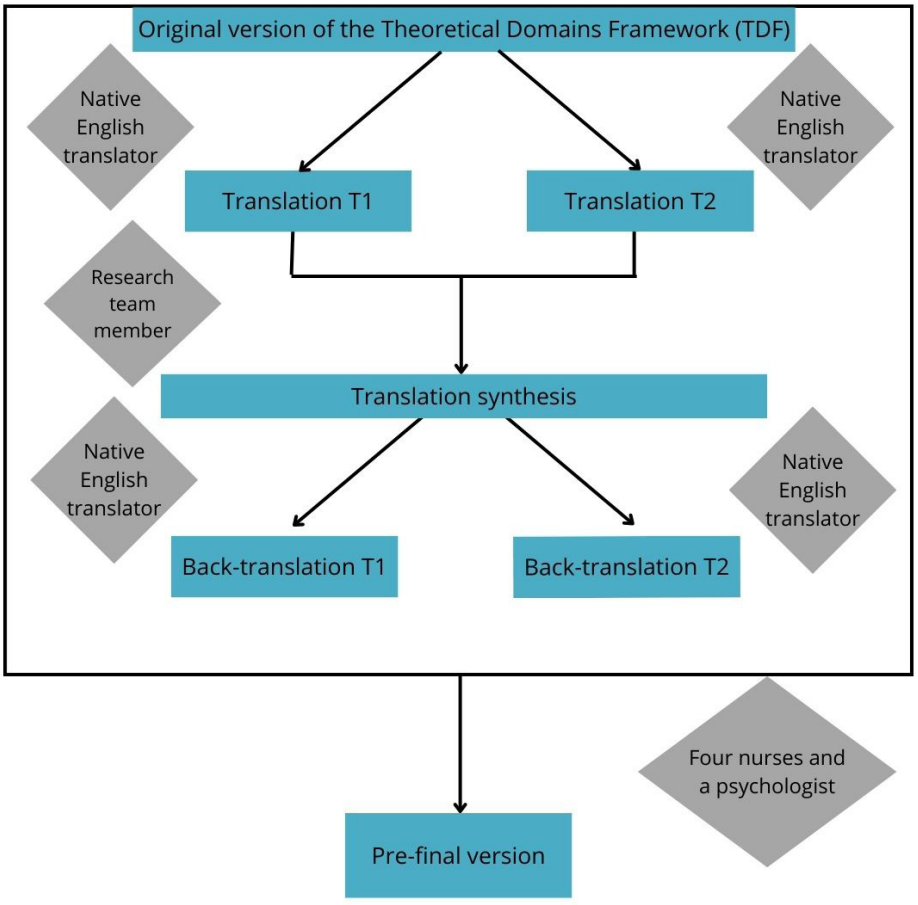

Figure 1. Flowchart of methodological stages of the current study.

The assessment by expert committee stage was carried out using the Delphi consensus technique. Each domain of the theoretical framework (14 in total) and its respective constructs (84 in total) of version T12 were assessed for equivalences: (1) semantic: the words of this translated theoretical framework will have the same meaning as the original theoretical framework, i.e., an equivalence relative to the meaning of words according to vocabulary and grammar; (2) idiomatic: the translated colloquial expressions will have the same meaning in the local cultural context, i.e., they refer to informal language used in everyday life; (3) experimental: the translated items will be considered in relation to the Brazilian population's life experiences, i.e., they refer to situations involved in the cultural context, bringing experiences with the characteristics and specificities of health practice environments in Brazil in their various contexts; (4) conceptual: the meaning will be representative of the concepts of interest, i.e., it explores the different ways in which the same concept can be understood.

To record each member's assessment of cross-cultural content validity of each item, a three-point Likert scale was used: not equivalent (value -1); undecided (value 0); and equivalent (value 1). If an item was judged as not equivalent or undecided, the expert was asked to suggest changes.

The theoretical framework content validity considered a quantitative and qualitative approach. The first was performed using the Content Validity Index (CVI), with an item being validated with a percentage calculation above or equal to 80%. Items that did not obtain a CVI equal to or greater than 80% or that achieved it, but that had pertinent suggestions for change made by experts, were re-assessed by the committee or changed after a qualitative analysis by the researchers. Qualitative assessment was performed through discussion between two researchers, in order to decide, among the validated items, which suggestions made by experts would or would not be accepted.

This study was approved by the *Universidade Federal de São Paulo* Research Ethics Committee, under Opinion 1098/2021 and CAAE 51881421.5.0000.5505. The authors of the TDF authorized and agreed to carry out this study.

RESULTS

The structure in its original version is called Theoretical Domains Framework. The stages of translation, translation synthesis and back-translation were carried out independently and in isolation, without communication between the individuals who participated in each of them, and no relevant disparities were observed between the versions proposed in Brazilian Portuguese (translations). In stage III, which corresponded to back-translations, the authors of the original TDF agreed with the final version presented and did not send any suggestions.

The only construct from the back-translation stage that did not show similarity with the original structure was that of domain 6 ("consequent regret"), which in the original version is described as "consequents". It was summarized as "consequent regret" in version T12.

In stage IV, the expert committee was composed of four nurses and one psychologist, considering the following expertise: two professionals with experience in methodological studies; one professional with experience in research on behavior change; one professional with experience in people management; and one professional with experience in interprofessional education.

To achieve validity according to CVI and internal consistency calculation using Cronbach's alpha, two rounds of assessment by an expert committee were necessary. Table 1 shows the constructs that presented some change after the first round of assessment by an expert committee. In the second assessment, all items reached a CVI equal to or greater than 80% and, in both rounds of assessment, the average CVI remained above 90%. It was not necessary to exclude items from the structure.

Five constructs remained with CVI for equivalence of 60%. However, the researchers chose to keep them, since the suggestions made by experts were in distinct and completely different equivalences, such as: (1) "*Conhecimento do ambiente da atuação*" - one expert reported indecision in the experimental and conceptual equivalences, with suggestions of changing to "*ambiente de realização de tarefa*" and "*cenário de prática*"; (2) "*Desenvolvimento das habilidades*" - one expert expressed indecision in all equivalences and suggested changing to "*competência*"; (3) "*Capacidade*" - the expert expressed indecision in the experimental and conceptual equivalences, suggesting the word "*aptidão*"; (4) "*Avaliação das habilidades*" - there was indecision in all equivalences by the same expert who suggested "*competência*" for this construct; (5) "*Metas (autônomas/controladas)*" - despite the indecision of two experts in semantic equivalence, they did not propose any suggestions.

According to Table 2, the pre-final translated and validated version of the TDF for Brazilian Portuguese is integrated by 14 domains relevant to the assessment of barriers to healthcare professionals' behavior change, classified as: (1) *conhecimento*; (2) *habilidades*; (3) *papel social/profissional e identidade*; (4) *crenças sobre capacidades*; (5) *otimismo*; (6) *crenças sobre consequências*; (7) *reforço*; (8) *intenções*; (9) *metas*; (10) *memória, atenção e processos de decisão emoção*; (11) *contexto ambiental e recursos*; (12) *influências sociais*; (13) *emoção*; and (14) *regulação comportamental*.

The CVI of 96.6% and Cronbach's alpha of 0.916, as shown in Table 3, demonstrate the robustness of values and confirm that the TDF presents satisfactory semantic, idiomatic, experimental and conceptual equivalence[2] in relation to the original items.

DISCUSSION

This study proposed to translate and cross-culturally adapt a theoretical framework for use in Brazil, which focuses on the assessment of barriers and facilitators for behavior change in healthcare professionals, understanding that these act as an obstacle to the implementation of scientific evidence in health practice. The great challenge in translation and content validity processes is to make the necessary adjustments and, at the same time, preserve the conceptual characteristics of the original instrument. The TDF is widely applied internationally, with a significant increase in publications focused on health, demonstrating its relevance in studies of behavior change, mainly for interventions in clinical and public health contexts.[18,20]

Table 1. Theoretical Domains Framework items and changes after the first round of expert committee review.

TDF items	Original version	Version T12	Version after expert committee
D1/ C1	Knowledge (including knowledge of condition/scientific rationale)	*Conhecimento (incluindo conhecimento da condição/ fundamento científico)*	*Conhecimento (incluindo conhecimento da condição/* ***embasamento científico****)*
D2	Skills (An ability or proficiency acquired through practice)	*Habilidades (A habilidade ou proficiência adquirida por meio da prática)*	*Habilidades (A* ***capacidade*** *ou proficiência adquirida por meio da prática)*
D3	Social/professional role and identity (A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting)	*Papel social/profissional e identidade (O conjunto coerente de comportamentos e qualidades pessoais exibida de um indivíduo em um ambiente social ou de trabalho)*	*Papel social/profissional e identidade (****Um*** *conjunto coerente* ***de qualidades pessoais demonstradas e comportamentos*** *de um indivíduo em um ambiente social ou de trabalho)*
D4	Beliefs about capabilities (Acceptance of the truth, reality or validity about an ability, talent or facility that a person can put to constructive use)	*Crenças sobre capacidades (Aceitação da verdade, realidade ou validade sobre uma habilidade, talento ou facilidade que a pessoa pode colocar para uso construtivo)*	*Crenças sobre capacidades (Aceitação da verdade, realidade ou validade sobre uma habilidade, talento ou facilidade que a pessoa pode* ***empregar para*** *uso construtivo)*
D6	Beliefs about consequences (Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation)	*Crenças sobre consequências (Aceitação sobre a verdade, realidade, ou validade sobre os resultados de um comportamento em determinada situação)*	*Crenças sobre consequências (Aceitação sobre a verdade, realidade, ou validade* ***em relação aos*** *resultados de um comportamento em determinada situação)*
D6/C2	Outcome expectancies	*Expectativas do resultado*	*Expectativas* ***em relação ao*** *resultado*
D6/C3	Characteristics of outcome expectancies	*Características das expectativas do resultado*	*Características das expectativas* ***em relação ao*** *resultado*
D6/C5	Consequents	*Arrependimento consequente*	***Consequências***
D7	Reinforcement (Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus)	*Reforço (Aumentando a probabilidade de resposta ao estabelecer uma relação de dependência, ou contingência, entre a resposta e determinado estímulo)*	*Reforço (Aumento* ***da*** *probabilidade de* ***uma*** *resposta* ***por meio do estabelecimento de*** *uma relação de dependência, ou contingência, entre a resposta e determinado estímulo)*
D7/C1	Rewards (Proximal/distal, valued/not valued, probable/ improbable)	*Recompensas (a longo/curto prazo, com valor/sem valor, provável/improvável)*	*Recompensas* ***(a curto prazo/a longo prazo, valorizada/ não valorizada, provável/ improvável)***
D7/C4	Consequents	*Consequentes*	***Consequências***
D9	Goals (Mental representations of outcomes or end states that an individual wants to achieve)	*Metas (Representações mentais de resultados ou estados finais que um indivíduo deseja alcançar)*	*Metas (Representações mentais de resultados ou* ***finalizações*** *que um indivíduo deseja alcançar)*
D9/C2	Goal priority	*Prioridade das metas*	*Prioridade* ***da meta***

Note: TDF = Theoretical Domains Framework; version T12 = version of translation synthesis 1 and 2; **D** = domain; **C** = construct.

Table 1. Continued...

TDF items	Original version	Version T12	Version after expert committee
D9/C3	Goal/target setting	*Definição da meta/alvo*	*Definição da meta/**do objetivo***
D10	Memory, attention and decision process (The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives)	*Memória, atenção e processos de decisão (A habilidade de reter informação, focar seletivamente em aspectos do ambiente e escolher entre duas ou mais alternativas)*	*Memória, atenção e processos de decisão (A **capacidade** de reter informação, focar seletivamente em aspectos do ambiente e escolher entre duas ou mais alternativas)*
D11	Environmental context and resources (Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence and adaptive behavior)	*Contexto ambiental e recursos (Qualquer circunstância da situação ou ambiente da pessoa que desencoraja ou incentiva o desenvolvimento de capacidades e aptidões, independência, competência social e comportamento adaptativo)*	*Contexto ambiental e recursos (Qualquer circunstância da situação ou ambiente da pessoa que desencoraja ou incentiva o desenvolvimento de **habilidades e capacidades**, independência, competência social e comportamento adaptativo)*
D12/C8	Intergroup conflict	*Conflito entre grupo*	*Conflito **intergrupo***
D13	Emotion (A complex reaction pattern, involving experiential, behavioral, and physiological elements, by which the individual attempts to deal with a personally significant matter or event)	*Emoção (Um complexo padrão de reação, envolvendo elementos experienciais, comportamentais e fisiológicos, em que o indivíduo tenta lidar com o assunto ou evento particularmente significativo)*	*Emoção (Um complexo padrão de reação, envolvendo elementos experienciais, comportamentais e fisiológicos, **no qual** o indivíduo tenta lidar com o assunto ou evento particularmente significativo)*
D13/C3	Affect	*Afeto*	***Afetividade***
D14	Behavioral regulation (Anything aimed at managing or changing objectively observed or measured actions)	*Regulação comportamental (Qualquer coisa que vise o gerenciamento ou alterar ações objetivamente observadas ou medidas)*	*Regulação comportamental (Qualquer coisa que vise **manejar** ou alterar ações objetivamente observadas ou mensuradas)*
D14/C3	Action planning	*Planejamento da ação*	***Plano de ação***

Note: TDF = Theoretical Domains Framework; version T12 = version of translation synthesis 1 and 2; **D** = domain; **C** = construct.

Table 2. Pre-final version of the Theoretical Domains Framework.

Domain (definition)	Constructs
1. Conhecimento (A consciência da existência de algo)	*Conhecimento (incluindo conhecimento da condição/embasamento científico)* *Conhecimento processual* *Conhecimento do ambiente da atuação*
2. Habilidades (A capacidade ou proficiência adquirida por meio da prática)	*Habilidades* *Desenvolvimento das habilidades* *Competência* *Capacidade* *Habilidades interpessoais* *Prática* *Avaliação das habilidades*

Table 2. Continued...

Domain (definition)	Constructs
3. Papel social/profissional e identidade (Um conjunto coerente de qualidades pessoais demonstradas e comportamentos de um indivíduo em um ambiente social ou de trabalho)	*Identidade profissional* *Papel profissional* *Identidade social* *Identidade* *Limites profissionais* *Confiança profissional* *Identidade de grupo* *Liderança* *Comprometimento organizacional*
4. Crenças sobre capacidades (Aceitação da verdade, realidade ou validade sobre uma habilidade, talento ou facilidade que a pessoa pode empregar para uso construtivo)	*Autoconfiança* *Competência percebida* *Autoeficácia* *Controle comportamental percebido* *Crenças* *Autoestima* *Empoderamento* *Confiança profissional*
5. Otimismo (A confiança de que as coisas acontecerão da melhor maneira ou de que os objetivos desejados serão alcançados)	*Otimismo* *Pessimismo* *Otimismo irreal* *Identidade*
6. Crenças sobre consequências (Aceitação sobre a verdade, realidade, ou validade em relação aos resultados de um comportamento em determinada situação)	*Crenças* *Expectativas em relação ao resultado* *Características das expectativas em relação ao resultado* *Arrependimento antecipado* *Consequências*
7. Reforço (Aumento da probabilidade de uma resposta por meio do estabelecimento de uma relação de dependência, ou contingência, entre a resposta e determinado estímulo)	*Recompensas (a curto prazo/a longo prazo, valorizada/não valorizada, provável/improvável)* *Incentivos* *Punição* *Consequências* *Reforço* *Contingências* *Sanções*
8. Intenções (Uma decisão consciente de realizar um comportamento ou a resolução de agir de determinada forma)	*Estabilidade das intenções* *Estágios do modelo de mudança* *Modelo transteórico e estágios de mudança*

Table 2. Continued...

Domain (definition)	Constructs
9. Metas (Representações mentais de resultados ou finalizações que um indivíduo deseja alcançar)	*Metas (a longo/curto prazo)* *Prioridade da meta* *Definição da meta/do objetivo* *Metas (autônomas/controladas)* *Plano de ação* *Intenção de implementação*
10. Memória, atenção e processos de decisão (A capacidade de reter informação, focar seletivamente em aspectos do ambiente e escolher entre duas ou mais alternativas)	*Memória* *Atenção* *Controle da atenção* *Tomada de decisão* *Sobrecarga cognitiva/cansaço*
11. Contexto ambiental e recursos (Qualquer circunstância da situação ou ambiente da pessoa que desencoraja ou incentiva o desenvolvimento de habilidades e capacidades, independência, competência social e comportamento adaptativo)	*Estressores ambientais* *Recursos/recursos materiais* *Cultura/clima organizacional* *Eventos importantes/incidentes críticos* *Interação pessoa x ambiente* *Barreiras e facilitadores*
12. Influências sociais (Aqueles processos interpessoais que podem fazer com que indivíduos mudem seus pensamentos, sentimentos ou comportamentos)	*Pressão social* *Normas sociais* *Conformidade do grupo* *Comparações sociais* *Normas do grupo* *Suporte social* *Poder* *Conflito intergrupo* *Alienação* *Identidade do grupo* *Modelação*
13. Emoção (Um complexo padrão de reação, envolvendo elementos experienciais, comportamentais e fisiológicos, no qual o indivíduo tenta lidar com o assunto ou evento particularmente significativo)	*Medo* *Ansiedade* *Afetividade* *Estresse* *Depressão* *Afetividade positiva/negativa* *Esgotamento (Burn-out)*
14. Regulação comportamental (Qualquer coisa que vise manejar ou alterar ações objetivamente observadas ou mensuradas)	*Automonitoramento* *Mudança do hábito* *Plano de ação*

Table 3. Domains and constructs of the Theoretical Domains Framework in the first and second round of Cross-Cultural Content Validity by an expert committee.

	Transcultural Content Validity								
	Content Validity Index (CVI)								Cronbach's alpha
	1st round				2nd round				
Theoretical Domains Framework domains and constructs	SE	IE	EE	CE	SE	IE	EE	CE	
1. Conhecimento:	1	1	0.8	0.8					0.632
1.1 Conhecimento (incluindo conhecimento da condição/ embasamento científico)	1	0.8	0.6	0.6	1	1	1	1	
1.2 Conhecimento processual	1	1	0.8	1					
1.3 Conhecimento do ambiente da atuação	1	1	0.8	0.6					
2. Habilidades	0.6	0.8	0.6	0.6	0.8	0.8	0.8	0.8	0.958
2.1 Habilidades	0.8	0.8	0.8	0.8					
2.2 Desenvolvimento das habilidades	0.8	0.8	0.6	0.8					
2.3 Competência	1	1	1	0.8					
2.4 Capacidade	0.8	0.8	0.6	0.6					
2.5 Habilidades interpessoais	0.8	0.8	0.8	0.8					
2.6 Prática	1	1	1	1					
2.7 Avaliação das habilidades	0.8	0.8	0.6	0.8					
3. Papel social/profissional e identidade	0.4	0.6	0.8	0.6	1	1	1	1	0.641
3.1 Identidade profissional	1	1	1	1					
3.2 Papel profissional	1	1	1	1					
3.3 Identidade social	1	1	1	1					
3.4 Identidade	0.8	0.8	0.8	0.8					
3.5 Limites profissionais	1	1	1	1					
3.6 Confiança profissional	1	1	1	1					
3.7 Identidade de grupo	1	1	1	1					
3.8 Liderança	1	1	1	1					
3.9 Comprometimento organizacional	0.8	1	1	0.8					
4. Crença sobre capacidades	1	0.8	0.8	0.8	1	1	1	1	0.257
4.1 Autoconfiança	1	1	1	1					
4.2 Competência percebida	1	1	1	1					
4.3 Controle comportamental percebido	1	1	1	1					
4.4 Crenças	1	1	1	1					
4.5 Autoestima	1	1	1	1					
4.6 Empoderamento	1	1	1	1					
4.7 Confiança profissional	1	1	1	1					
5. Otimismo	1	1	1	1					-0.351
5.1 Otimismo	1	1	1	1					
5.2 Pessimismo	1	1	1	1					
5.3 Otimismo irreal	0.8	1	0.8	1					
5.4 Identidade	1	1	1	1					

Note: SE = semantic equivalence; IE = idiomatic equivalence; EE = experimental equivalence; CE = conceptual equivalence.

Table 3. Continued...

	Transcultural Content Validity								
	Content Validity Index (CVI)								Cronbach's alpha
	1st round				2nd round				
6. Crença sobre as consequências	0.8	1	0.8	1	1	1	1	1	0.84
6.1 Crenças	1	1	1	1					
6.2 Expectativas em relação ao resultado	1	0.8	0.8	1	1	1	1	1	
6.3 Características das expectativas em relação ao resultado	1	0.8	0.8	1	1	1	1	1	
6.4 Arrependimento antecipado	1	1	1	1					
6.5 Consequências	0.4	0.4	0.4	0.4	1	1	1	1	
7. Reforço	0.4	0.8	0.8	0.8	1	1	1	1	0.546
7.1 Recompensas (a curto prazo/a longo prazo, valorizada/não valorizada, provável/improvável)	0.8	0.8	0.6	0.8	1	1	1	1	
7.2 Incentivos	1	1	1	1					
7.3 Punição	1	1	1	1					
7.4 Consequências	1	0.8	0.8	0.8					
7.5 Reforço	1	1	1	1					
7.6 Contingências	1	1	0.8	1					
7.7 Sanções	1	1	1	1					
8. Intenções	1	1	1	1					-
8.1 Estabilidade das intenções	1	1	1	1					
8.2 Estágios do modelo de mudança	1	1	1	1					
8.3 Modelo transteórico e estágios de mudança	1	1	1	1					
9. Metas	0.6	0.8	0.8	1	0.8	0.8	0.8	0.8	0.712
9.1 Metas (a longo/curto prazo)	0.8	1	1	1					
9.2 Prioridade da meta	0.6	1	1	1	1	1	1	1	
9.3 Definição da meta/do objetivo	0.8	1	0.8	1	1	1	1	1	
9.4 Metas (autônomas/controladas)	0.6	1	1	1					
9.5 Plano de ação	0.8	1	1	1					
9.6 Intenção de implementação	0.8	1	0.8	1					
10. Memória, atenção e processos de decisão	1	1	0.8	1					0
10.1 Memória	1	1	1	1					
10.2 Atenção	1	1	1	1					
10.3 Controle de atenção	1	1	1	1					
10.4 Tomada de decisão	1	1	1	1					
10.5 Sobrecarga cognitiva/cansaço	1	1	1	1					
11. Contexto ambiental e recursos	0.8	0.8	0.6	0.8	1	1	1	1	0
11.1 Estressores ambientais	1	1	1	1					
11.2 Recursos/recursos materiais	1	1	1	1					
11.3 Cultura/clima organizacional	1	1	1	1					
11.4 Eventos importantes/incidentes críticos	1	1	1	1					

Note: SE = semantic equivalence; IE = idiomatic equivalence; EE = experimental equivalence; CE = conceptual equivalence.

Table 3. Continued...

	Transcultural Content Validity								
	Content Validity Index (CVI)								Cronbach's alpha
	1st round				2nd round				
11.5 Interação pessoa x ambiente	1	1	0.8	1					
11.6 Barreiras e facilitadores	1	1	1	1					
12. Influências sociais	1	1	0.8	1					0.255
12.1 Pressão social	1	1	1	1					
12.2 Normas sociais	1	1	1	1					
12.3 Conformidade do grupo	1	1	1	1					
12.4 Comparações sociais	1	1	1	1					
12.5 Normas do grupo	1	1	1	1					
12.6 Suporte social	1	1	0.8	1					
12.7 Poder	1	1	1	1					
12.8 Conflito intergrupo	0.4	0.8	0.8	0.8	1	1	1	1	
12.9 Alienação	1	1	1	1					
12.10 Identidade do grupo	1	1	1	1					
12.11 Modelação	0.8	1	1	1					
13. Emoção	0.8	0.8	0.8	0.8	1	1	1	1	0.645
13.1 Medo	1	1	1	1					
13.2 Ansiedade	1	1	1	1					
13.3 Afetividade	0.8	1	1	1	1	1	1	1	
13.4 Estresse	1	1	1	1					
13.5 Depressão	1	1	1	1					
13.6 Afetividade positiva/negativa	0.8	1	1	1	1	1	1	1	
13.7 Esgotamento (burn-out)	1	1	1	1					
14. Regulação Comportamental	0.6	0.8	0.8	0.8	1	1	1	1	0.8
14.1 Automonitoramento	1	1	1	1					
14.2 Mudança do hábito	1	1	1	1					
14.3 Plano de ação	0.8	0.8	0.8	0.8					
Mean	0.928				0.966				0.916

Note: SE = semantic equivalence; IE = idiomatic equivalence; EE = experimental equivalence; CE = conceptual equivalence.

In order to reach the pre-final version through assessment by an expert committee, it is necessary to carefully deal with the divergences that arise among the committee members. In this study, the most relevant divergences at this assessment stage were concentrated on the following terms/constructs: skills, ability, scientific rationale, consequents and end states.[21]

Both the words "skills" and "ability" were translated as "*habilidade*" in versions T1, T2 and T12 in domains 2, 4 and 10. However, in versions T1, T2, T12, in domains 2 and 11, they were translated as "*capacidade*". After analysis, the consensus for the pre-final version of the theoretical framework was that "*habilidade*" would be used for the word "skills", and "*capacidade*", for the words "ability" and "capabilities". The definition of expressions and constructs needs to consider the meaning of each term; thus, in the context of the TDF, for instance, skills refers to an ability or proficiency acquired through practice, and ability represents an individual's capacity to perform a certain behavior.[22]

Another construct that generated disagreement was "scientific rationale", an expression translated as "*fundamento científico*"; however, cosnidering the considerations of two experts, it was decided to use "*embasamento científico*", as it is an expression more commonly used in Brazil. For the application of EBP

in nursing, the scientific basis is configured as an important element to guide clinical decisions, being intrinsically related to leadership skills and decision-making capacity, essential for safe and effective nursing practice.[23,24]

The construct "consequents", initially translated in version T1 as "*consequentes*" and, in T2, as "*consequentes/conquências*", after assessing experts' suggestions, was defined as "*conquências*". The expression "*estado final*" included in domain 9 ("*metas (representações mentais de resultados ou estados finais que um indivíduo deseja alcançar)*"), was modified to "*finalizações*", after a consensus reached by the researchers based on experts' suggestions.

After the second round of assessment, most items obtained an equivalence CVI greater than 80%. Therefore, it can be considered an instrument with a high level of content validity, given that the level of validity established by five experts is universally acceptable when an CVI above 0.80 is achieved, item by item. Thus, it was possible to confirm that the assessments carried out by an expert committee considerably favor validity quality and item content accuracy.[25,26]

The domains that obtained the best validity indices (considered to be >0.95) after assessment by an expert committee were 3 ("*papel social/profissional e identidade*") 4 ("*crenças sobre capacidades*"), 5 ("*otimismo*"), 6 ("*crenças sobre consequências*"), 7 ("*reforço*"), 8 ("*intenções*"), 10 ("*memória, atenção e processos de decisão*"), 11 ("*contexto ambiental e recursos*"), 12 ("*influências sociais*"), 13 ("*emoção*") and 14 ("*regulamentação comportamental*"). When compared with the validity process of the original theoretical structure, it is noted that domains 3, 4, 10, 13 also achieved good content proximity according to the index considered sufficient by the study. However, it is worth noting that domains 6, 11, 12 and 14 obtained levels considered below those expected by the index used in the original theoretical structure, unlike what occurred in this study.[2]

The TDF's contribution to implement science around the world is unquestionable, from public health to specialized health sectors. The current trend is to apply the TDF with an interdisciplinary approach, including technologies such as digital health and artificial intelligence, aiming to improve behavior change strategies. International collaborations, methodological advances and longitudinal studies are essential to assess TDF's sustainability and effectiveness in diverse contexts.[18]

Finally, the pre-final version of the theoretical framework showed excellent content validity and internal consistency, since the average CVI is classified as such when it presents an index equal to or greater than 0.9, and Cronbach's alpha is considered very good when it reaches a value above 0.8. As for domains 4, 5, 10, 11 and 12 of the TDF, weak internal consistencies were observed (value <0.3), indicating that, in the next validity stage, which involves analysis of psychometric properties, it will be necessary to perform an exploratory factor analysis followed by a confirmatory factor analysis to contribute to the quality and validity of the final framework.[25,27-29]

Hence, conducting an exploratory factor analysis will be essential to identify possible groupings or necessary adjustments in the items, ensuring that they adequately represent the theoretical constructs under analysis. Subsequently, confirmatory factor analysis will allow testing the identified structure, assessing whether the data fit the proposed theoretical model. These stages are crucial to ensure a robust validity of the TDF in the Brazilian cultural context, considering the sociocultural specificities that may impact the perception and interpretation of items. By performing these analyses, it is expected to refine the theoretical structure and ensure that the final instrument is reliable and representative for the different scenarios of nursing practice and research in Brazil.

Considering not only TDF's contribution to EBP and implementation science, but also the completion of this phase of translation and cross-cultural adaptation, it is necessary to move on to the next stage in order to establish TDF equivalence and validity for use in this country.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The TDF was successfully translated and culturally adapted to Brazilian Portuguese, and showed acceptable internal consistency and validity according to the CVI and Cronbach's alpha coefficient. The TDF is an appropriate and valid resource for researchers, managers, and healthcare professionals to understand and analyze cognitive, affective, social, and environmental influences on human behavior, allowing the identification of essential interdisciplinary factors that impact professional practice and health interventions. Furthermore, the theoretical framework can be used flexibly in different contexts, being a valuable tool to support strategies that support knowledge translation actions and promotion of behavioral changes in various nursing contexts in Brazil, contributing to improving care and educational practices. For instance, it can be used to identify barriers and facilitators in nurses' behavior during the implementation of clinical protocols, such as adherence to practices to prevent healthcare-associated infections. In the field of pediatric nursing, the TDF can assist in the analysis of factors that influence communication between professionals and families, promoting care that is more centered on the needs of children and their caregivers.

Furthermore, in the context of nursing education, the TDF can guide the development of continuing education programs, identifying knowledge gaps or attitudes that impact clinical practice. In extension or research projects, the TDF can be used to assess community interventions, such as programs aimed at promoting maternal and child health, considering the social and cultural factors that influence the behavior of the team and the population assisted. These examples demonstrate the versatility of the TDF as a theoretical and practical tool, with great potential to support behavioral changes and knowledge translation strategies that strengthen nursing care quality in Brazil.

Thus, the theoretical structure is complete for the pre-test stage with the target population and psychometric analysis

to later be used during the implementation of actions based on scientific evidence in clinical practice with the purpose of promoting behavior change among nurses and other healthcare professionals in Brazil.

As limitations, the CVI and Cronbach's alpha provide important measures of validity and consistency, but do not assess other aspects, such as predictive validity or test-retest reliability. Although translation and content validity were performed, the practical application of the translated TDF in field studies or real interventions was not assessed in the present study. The study did not include an assessment stage of the adapted instrument with participants representing the target audience, which could provide additional insights into clarity and practical applicability.

ACKNOWLEDGMENTS

To the healthcare professionals who composed the expert committee for this study and to the Brazilian National Council for Scientific and Technological Development.

FINANCIAL SUPPORT

Brazilian National Council for Scientific and Technological Development (In Portuguese, *Conselho Nacional de Desenvolvimento Científico e Tecnológico* - CNPq) – Grant Number 308281/2015-2.

DATA AVAILABILITY RESEARCH

Data is available on demand to authors.

CONFLICT OF INTEREST

No conflict of interest.

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