

**RITA PAVIONE RODRIGUES PEREIRA**

**Enurese noturna: uma visão sistêmica, holística e  
educacional**

Tese apresentada à Faculdade de Medicina da  
Universidade de São Paulo para obtenção de título de  
Doutor em Ciências

Programa de Ciências da Reabilitação

Orientadora: Profa. Dra. Clarice Tanaka

São Paulo

2023

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## DEDICATÓRIA

Dedico esta tese aos meus amados pais, **Janio e Áurea** por serem minha referência e refúgio; ao meu amado filho **Davi**, que chegou no meio desse processo e trouxe novo brilho e propósito à minha vida; **às crianças com enurese noturna**, as quais tive a honra de atender, acompanhar e com quem aprendi muito; por fim dedico a **mim mesma** por persistir apesar dos percalços encontrados durante essa trajetória.

## AGRADECIMENTOS

À **Deus**, por me conceder a vida e guiá-la, me permitindo descobrir e viver meu propósito.

À minha querida orientadora, **Prof<sup>a</sup>. Dra. Clarice Tanaka**, pelo apoio, acolhimento, conselhos, cuidados; pela confiança em meu trabalho, pelas oportunidades oferecidas e pelo constante aprendizado pessoal e profissional adquiridos com essa convivência tão estreita.

Aos meus pais, **Janio e Áurea**, por serem minha referência, minha fonte de inspiração, exemplos de honestidade e humildade, pelo árduo esforço na minha criação, por me ensinarem a não desistir dos meus sonhos, pelo amor incondicional.

À **Cacau**, minha filhinha canina, por ser minha companhia nas inúmeras madrugadas de estudo. Aconchegada em meu colo, mas cuidando que sendo cuidada.

Ao meu amado filho **Davi**, por dar novo propósito a minha vida e me alegrar com seu sorriso.

Às **crianças com enurese e seus familiares**, por serem razão e inspiração para a minha busca por conhecimento. Obrigada pela confiança e aprendizado contínuo.

"O presente trabalho foi realizado com apoio da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) - Código de Financiamento 001"

Muito obrigada!

*"Uma mente que se abre a uma nova ideia, jamais volta ao seu tamanho original".*

Albert Einstein

## **NORMALIZAÇÃO ADOTADA**

Esta tese está de acordo com as seguintes normas, em vigor no momento desta publicação:

Referências: *adaptado de International committee of medical journals editors* (Vancouver).

Universidade de São Paulo. Faculdade de Medicina. Divisão de Biblioteca e Documentação. *Guia de Apresentação de dissertações, teses e monografias*. Elaborado por Aneliese Carneiro da Cunha, Maria Julia de A. L. Freddi, Maria F. Crestana, Marinalva de Souza Aragão, Suely Campos Cardoso, Valéria Vilhena. 3a ed. São Paulo: Divisão de Biblioteca e Documentação; 2011.

Abreviaturas dos títulos dos periódicos de acordo com *List of Journals Indexed in Index Medicus*.

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## RESUMO

Pereira RPR. **Enurese noturna: uma visão sistêmica, holística e educacional**[tese]. São Paulo: Faculdade de Medicina, Universidade de São Paulo; 2023.

**Introdução:** As evidências apontam a enurese noturna não como um fenômeno isolado de perda urinária durante o sono, mas engloba um conjunto de manifestações sistêmicas que impactam significativamente a qualidade de vida e o desenvolvimento infantil. No entanto, o entendimento da relação clínica e fisiológica dessas manifestações sistêmicas ainda é um desafio. Conhecer detalhes da literatura sobre EN podem fornecer melhores insights sobre as manifestações clínicas integradas e possibilitar o desenvolvimento de estratégias que garantam maior assertividade na avaliação e escolhas terapêuticas para estas crianças. Portanto o objetivo deste estudo é desenvolver um modelo de fenotipagem clínica das crianças com enurese noturna baseado em evidências para nortear os profissionais atuantes na área e uma plataforma educacional (Omnichannel) em um ambiente digital com linguagem acessível e divertida para as crianças e suas famílias.

**Métodos:** Esta tese é uma compilação de 3 artigos originais, (um protocolo para revisão analítica e metodológica da literatura, um artigo de fenotipagem clínica para crianças com enurese noturna, e um artigo de tradução e adaptação transcultural de um questionário de qualidade de vida para disfunções urinárias em crianças), além disso foi incluída à tese o material da Plataforma Educacional (Omnichannel) Xixi e Cocô sem crise, desenvolvida para disseminar informação sobre função e disfunção urinária para crianças e suas famílias.

**Resultados:** A tese é uma compilação de 3 artigos originais, (um protocolo para revisão analítica e metodológica da literatura, um artigo de fenotipagem clínica para crianças com enurese noturna, e um artigo de tradução e adaptação transcultural de um questionário de qualidade de vida para disfunções urinárias em crianças, além disso foi incluída à tese o material da Plataforma Educacional (Omnichannel) Xixi e Cocô sem crise, desenvolvida para disseminar informação sobre função e disfunção urinária e intestinal para crianças e suas famílias.

**Conclusão:** Este estudo possibilitou o desenvolvimento de um modelo de fenotipagem para crianças com EN baseado em evidências que trarão importantes contribuições para o campo clínico e estudos futuros. Além disso, possibilitou a construção de uma plataforma educacional digital (Omnichannel) sobre função e disfunção urinária e intestinal, destinada a crianças e suas famílias.

**Descritores:** enurese noturna; criança; fenotipagem, mídias sociais, educação em saúde

## ABSTRACT

Pereira RPR. **Nocturnal enuresis: a systemic, holistic and educational vision** [tese]. São Paulo: Faculdade de Medicina, Universidade de São Paulo; 2020.

**Introduction:** Evidence points to nocturnal enuresis not as an isolated phenomenon of urinary loss during sleep, but encompasses a set of systemic manifestations that significantly impact quality of life and child development. However, understanding the clinical and physiological relationship of these systemic manifestations is still a challenge. Knowing details of the literature on NE can provide better insights into the integrated clinical manifestations and enable the development of strategies that guarantee greater assertiveness in the assessment and therapeutic choices for these children. Therefore, the objective of this study is to develop a model of clinical phenotyping of children with nocturnal enuresis based on evidence to guide professionals working in the area and an educational platform (Omnichannel) in a digital environment with accessible and fun language for children and their families.

**Methods:** This thesis is a compilation of 3 original articles, (a protocol for analytical and methodological review of the literature, an article on clinical phenotyping for children with nocturnal enuresis, and an article on the translation and cross-cultural adaptation of a quality of life questionnaire for urinary dysfunctions in children), in addition, material from the Educational Platform (Omnichannel) 'Xixi e Coco sem Crise', developed to disseminate information on urinary function and dysfunction for children and their families, was also included in the thesis.

**Results:** The thesis is a compilation of 3 original articles, (a protocol for analytical and methodological review of the literature, an article on clinical phenotyping for children with nocturnal enuresis, and an article on the translation and cross-cultural adaptation of a quality of life questionnaire for urinary dysfunctions in children, in addition, material from the Educational Platform (Omnichannel) 'Xixi e Coco sem Crise', developed to disseminate information on urinary function and dysfunction for children and their families, was also included in the thesis.

**Conclusion:** This study enabled the development of an evidence-based phenotyping model for children with EN that will bring important contributions to the clinical field and future studies. In addition, it enabled the construction of a digital educational platform (Omnichannel) on urinary and intestinal function and dysfunction, aimed at children and their families.

**Descriptors:** nocturnal enuresis; child; phenotyping, social media, health education

## APRESENTAÇÃO

**Enurese noturna: uma visão sistêmica, holística e educacional**, objeto desta tese de doutorado, é parte do projeto intitulado *‘Estimulação sensorial e neuromotora no tratamento de crianças e adolescentes com enurese noturna: ensaio clínico randomizado’* aprovado pelo Comitê de Ética do Hospital das Clínicas da FMUSP (Número do Parecer: 3.555.725 / CAAE 70682317.5.0000.0068), idealizado e executado na Divisão de Fisioterapia do Instituto Central do Hospital das Clínicas.

A tese traz uma visão inovadora sobre a enurese noturna, que visa impactar positivamente a vida das crianças acometidas e de suas famílias, bem como ampliar a visão dos profissionais envolvidos no cuidado desta população. É apresentada em forma de compilação de artigos, portanto, composta por três artigos principais com metodologias distintas: **1 *Clinical phenotyping of children with nocturnal enuresis: A critical review-based proposal*** (protocolo para revisão analítica e metodológica da literatura); **2 *Clinical phenotyping of children with nocturnal enuresis: a key classification to approach improvement*** (desenvolvimento da fenotipagem clínica de crianças com enurese noturna); **3 *Pediatric Incontinence Questionnaire (PINQ): Translation and transcultural adaptation to Brazilian Portuguese*** (artigo de tradução e adaptação transcultural do questionário de qualidade de vida específico para disfunção urinária em crianças). Os três artigos foram submetidos para publicação em periódicos indexados nas bases de dados ‘Web of Science’ e ‘Medline/Pubmed’, estão disponíveis na íntegra e para cada um é apresentada uma análise crítica, separadamente.

Além dos artigos, foi incluída à tese a o material da Plataforma Educacional (**omnichannel**) desenvolvida durante o doutorado para disseminar informações sobre função e disfunção urinária e intestinal, em um ambiente digital com linguagem acessível e divertida para crianças e suas famílias.

Embora o texto sistematizado desta tese tenha tido origem no estudo supracitado que iniciou em 2016, minha trajetória pesquisando e acompanhando clinicamente crianças com enurese começou em 2011 com o projeto de

mestrado; no qual investiguei e pude comprovar a existência de alterações psicomotoras nestas crianças, o que estimulou uma mudança no olhar do fisioterapeuta ao abordar este público. Portanto, já são 12 anos de aprendizado intenso e crescente, que me deram a oportunidade de participar de alguns projetos geradores de conhecimento e informação. Dentre eles podemos destacar:

### **ELABORAÇÃO DE CAPÍTULOS DE LIVROS e ARTIGO CIENTÍFICO**

**Título do artigo:** Children with nocturnal enuresis have posture and balance disorders

**Autores:** Rita Pavione Rodrigues Pereira, Simone Nascimento Fagundes, Adriene Surry Lebl, Letícia Azevedo Soster, Marcos Giannetti Machado, Vera Herminia Koch, Clarice Tanaka

**Periódico:** Journal Pediatric Urology

**Ano de publicação:** 2016

**DOI:** [10.1016/j.jpurol.2016.05.003](https://doi.org/10.1016/j.jpurol.2016.05.003)

**Nome do livro:** Fisioterapia - Série Pediatria - Instituto da Criança - FMUSP - 2ª Edição

**Organizadores:** Regina Célia Turola Passos Juliani, Maristela Trevisan Cunha, Ana Lúcia Capareli Lahóz, Carla Marques Nicolau, Lúcia Cândida Soares de Paula, Adriana Della Zuana

**Capítulo 29:** Fisioterapia nas Disfunções Miccionais e Coloproctológicas na Infância. Fisioterapia

**Autora:** Rita Pavione Rodrigues Pereira

**Editores e ano:** Editora Manole, 2018

**Nome do livro:** Enurese Noturna: diagnóstico e tratamento. 1ªed

**Organizadores:** Edwiges Ferreira de Mattos Silveiras, Rodrigo Fernando Pereira

**Capítulo 9:** O papel da fisioterapia no tratamento da enurese

**Autoras:** Rita Pavione Rodrigues Pereira e Clarice Tanaka

**Editores e ano:** Artmed Editora, 2012

### **PARTICIPAÇÃO EM PROGRAMAS TELEVISIVOS**

**Programa:** Papo de mãe

**Emissora:** TV Cultura

**Tema da matéria:** [Até que idade é normal ocorrer escapes de xixi?](#)

**Data da exibição:** 29/10/2019

**Programa:** Bem-Estar

**Emissora:** TV Globo

**Tema da matéria:** [Fisioterapia ajuda crianças a controlar a incontinência urinária](#)

**Data da exibição:** 28/08/2014

## APRESENTAÇÃO EM EVENTOS CIENTÍFICOS

**Evento:** Joint Congress of the International Children's Continence Society and the Society for Research into Hydrocephalus and Spina Bifida (SRHSB)

**Data:** 21/06/2017 a 24/06/2017

**Local:** Saint Louis, Missouri - USA

**Trabalhos Apresentados:**

- 1) Physiotherapy techniques in Treatment of Nocturnal Enuresis and Other Voiding Dysfunctions: A Systematic Review
- 2) Development of a home-based task-oriented program for parents and children with voiding dysfunction and nocturnal enuresis

**Evento:** XXXV Congreso de la Confederación Americana de Urología (CAU). XXI Congreso de la SIUP. XII Congreso de la Sociedad Panameña de Urología. 4 al 8 de octubre de 2016. Megapolis Convention Center, Ciudad de Panamá

**Data:** 04/10/2016 a 08/10/2016

**Local:** Cidade do Panamá - Panamá

**Trabalhos Apresentados:**

- 1) The treatment of voiding disorders in children may benefit from a more embracing Physiotherapy approach. A systematic review (oral)
- 2) Avaliação de desempenho motor em crianças com enurese (poster)
- 3) Atuação da fisioterapia com enfoque neuromotor no tratamento em uma criança com enurese: Relato de caso (poster)

**Evento:** 26th Congress of the European Society for Paediatric Urology

**Data:** 14/10/2015 a 17/10/2015

**Local:** Praga - República Tcheca

**Trabalhos Apresentados:**

- 1) Posture and Mobility changes in patients with nocturnal enuresis (poster)

2) Patients with enuresis may have balance disorders (oral)

**Evento: 48th ESPN Annual Scientific Meeting of the European Society for Paediatric Nephrology**

**Data:** 03/09/2015 a 05/09/2015

**Local:** Bruxelas - Bélgica

**Trabalhos Apresentados:**

- 1) Posture and Mobility changes in patients with nocturnal enuresis (oral)
- 2) Patients with enuresis may have balance disorders (poster)

**Evento: XXXIII Congresso da Confederação Americana de Urología (CAU) 2014 e XIX Congresso Sociedade Ibero Americana de Uropediatria (SIUP)**

**Data:** 23/11/2014 a 27/11/2014

**Local:** Punta del Leste - Uruguai

**Trabalho Apresentados:**

- 1) Posture and Mobility changes in patients with nocturnal enuresis (oral)
- 2) Patients with enuresis may have balance disorders (oral)

**Evento: The sixteenth Congress of The International Pediatric Nephrology Association – IPNA 2013**

**Data:** 29/08/2013 a 03/09/2013

**Local:** Shangai - China

**Trabalhos Apresentados:**

- 1) The hip and spine mobility is diminished in enuretic children and teenagers
- 2) The postural alignment in enuretic children and teenagers
- 3) Postural control in children and teenagers with enuresis

**ORIENTAÇÃO PARA PRODUÇÃO DE MATERIAL EDUCATIVO INSTITUCIONAL (Blog em construção para acesso público dos materiais)**

**Link de Acesso ao material:**

[https://drive.google.com/drive/folders/1p2AAGHKts6\\_N4uMxRbypdDzpiBN5k4kw?usp=share\\_link](https://drive.google.com/drive/folders/1p2AAGHKts6_N4uMxRbypdDzpiBN5k4kw?usp=share_link)

***Participação Fisioterapeuta Gabriella Fotakos***

Desenvolvimento de Vídeo-animação sobre treinamento de bexiga

Desenvolvimento de Aplicativo móvel GOTTA A PEE (em construção)



<p><b>Participação Fisioterapeuta Aline Mazzalli</b> Desenvolvimento de Vídeo-animação sobre Desfralde</p>
<p><b>Participação Fisioterapeuta Daniela Souza</b> Aplicativo móvel Diário Miccional Infantil - XIXAPP (em construção)</p>
<p><b>Participação Fisioterapeuta Hingrid Retondi</b> Desenvolvimento de Infográfico Cocô sem Dor</p>
<p><b>Participação Fisioterapeuta Adriana Santana</b> Desenvolvimento de Infográfico Disfunção Miccional</p>
<p><b>Participação Fisioterapeuta Beatriz Garcia</b> Desenvolvimento de Infográfico Enurese noturna</p>
<p><b>Participação Fisioterapeuta Maiara Costa</b> Desenvolvimento de Ebook Xixi e Cocô Feliz - história em quadrinhos</p>
<p><b>Participação Fisioterapeuta Patricia França</b> Desenvolvimento de Diário Miccional com Manual de instruções personalizado</p>
<p><b>Participação Fisioterapeutas Ana Stervid e Andreza Marinho</b> Diário Miccional Lúdico Personalizado</p>
<p><b>Participação Fisioterapeutas Andreza Marinho, Rita Pavione e Patrícia França</b> Desenvolvimento de Diário Miccional Xixi e Cocô sem crise Desenvolvimento de Diário Intestinal Xixi e Cocô sem crise</p>

Acredito que na área específica da fisioterapia, os resultados de todas as iniciativas apresentadas neste estudo poderão consolidar linhas de pesquisa produtiva na área e principalmente construir evidências para direcionar uma abordagem mais efetiva nos programas de reabilitação da enurese noturna.



## 1. INTRODUÇÃO

A enurese noturna (EN) é relatada em diferentes culturas desde a antiguidade. É uma condição extremamente comum na infância que afeta aproximadamente 5 a 10% de crianças aos 7 anos de idade, 3% dos adolescentes e 1% de pessoas em idade adulta(1–3).

Definida pela *International Children's Continence Society* (ICCS), como a perda involuntária de urina durante o sono em indivíduos com cinco anos ou mais, é clinicamente subdivida em enurese noturna monossintomática (ENM) quando as perdas ocorrem apenas durante o sono e, enurese noturna não monossintomática (ENNM) quando está associada a outros sintomas do trato urinário inferior; tais como perdas diurnas, urgência, dificuldades de esvaziamento, necessidade de postergar a micção, frequência miccional diurna anormal, dentre outros. Pode também ser primária ou secundária, com base em um período seco menor ou maior que 6 meses, respectivamente. Embora os subtipos tenham definições claras, observa-se grande sobreposição entre ENM e ENNM tanto na fisiopatologia quanto no manejo(4–7).

A etiologia é multifatorial e os mecanismos fisiopatológicos heterogêneos. Por muito tempo a EN esteve inserida no rol de transtornos psiquiátricos, mas esse entendimento começou a mudar na década de 80, quando se tornou clara a relação de fatores somáticos, associados à patogênese(7). Acredita-se que a EN seja decorrente da combinação da falta de liberação de vasopressina durante o sono, hiperatividade da bexiga e a incapacidade de despertar pelas sensações da bexiga cheia(8,9). Sabe-se da influência genética e hereditária(10–12) e há

fortes evidências que apontam para um atraso funcional na maturação e processamento do sistema nervoso central (SNC)(13–19).

A deficiência do processamento do sinal inibitório no tronco encefálico é apontada como uma das causas, explicando a incapacidade de inibir a atividade detrusora e a micção durante o sono, embora estudos recentes têm mostrado anormalidades microestruturais em outras áreas do SNC, como o tálamo, o giro frontal medial, o córtex cingulado anterior e a ínsula de crianças com EN(18,20), o que pode explicar a ocorrência de EN concomitante a outras manifestações clínicas, tais como: as urológicas (no subtipo ENNM)(21–28), gastrointestinais(28–33), psiquiátricas e psicológicas(26,28,34–42), manifestações socioemocionais(5,7,41–43), achados neurais e desordens do neurodesenvolvimento(13–20,43,44), desordens de sono(45–56), manifestações respiratórias(54,56–62), desordens renais, cardiovasculares, hormonais, metabólicas (48,63–77), e manifestações psicomotoras(78–81).

É importante observar que mesmo diante de evidências crescentes de que a EN é uma desordem complexa, que impacta negativamente a qualidade de vida tanto das crianças como de suas famílias, as abordagens atuais ainda estão focadas em aspectos isolados referentes ao molhar durante o sono e não necessariamente buscam integrar a resolução das demais manifestações clínicas.

Compreender a EN em sua totalidade, de forma integrada e holística é o caminho para promover maior assertividade na avaliação e escolhas terapêuticas pelos profissionais envolvidos no cuidado das crianças com EN. Além disso, se faz necessário educar e conscientizar o público leigo sobre o fato

de que a EN é um problema de saúde que pode e deve ser tratado, elucidando a importância do reconhecimento dos sintomas e a busca por ajuda profissional.

Portanto, o objetivo do presente estudo é desenvolver um modelo de fenotipagem clínica das crianças com enurese noturna baseado em evidências, que seja claro e inteligível para todos os profissionais, e uma plataforma educacional (omnichannel) em um ambiente digital com linguagem acessível e divertida para as crianças e suas famílias.

## 2. CITAÇÃO COMPLETA DOS ARTIGOS

### *Artigo 1 - Clinical phenotyping of children with nocturnal enuresis: A critical review-based proposal*

**Physical Therapy Reviews**  
**Clinical phenotyping of children with nocturnal enuresis: A critical review-based proposal**  
 –Manuscript Draft–

Manuscript Number:	
Full Title:	Clinical phenotyping of children with nocturnal enuresis: A critical review-based proposal
Article Type:	Narrative Review
Keywords:	1.nocturnal enuresis 2.child 3.phenotype 4.phenotyping 5.review
Corresponding Author:	Rita Pavione Rodrigues Pereira, MD FMUSP: Universidade de Sao Paulo Faculdade de Medicina Sao Paulo, Sao Paulo BRAZIL
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	FMUSP: Universidade de Sao Paulo Faculdade de Medicina
Corresponding Author's Secondary Institution:	
First Author:	Rita Pavione Rodrigues Pereira, MD
First Author Secondary Information:	
Order of Authors:	Rita Pavione Rodrigues Pereira, MD Clarice Tanaka, PhD
Order of Authors Secondary Information:	
Abstract:	Nocturnal enuresis (NE) is an extremely common condition in childhood and is known for its heterogeneous pathophysiological mechanisms, multifactorial aetiology, course of progression/remission and varied treatment response. Evidence from basic science and clinical practice has shown that NE is not an isolated phenomenon of urinary loss during sleep but encompasses a set of conditions related to different systems, which significantly impact the quality of life and development of children. The accurate recognition of these conditions allows for a better understanding of the pathophysiological mechanisms and greater assertiveness in the assessment and therapeutic choices for NE. The aim of this study is to propose a phenotyping model for children with NE based on the contemporary evidence of clinical, physiological, and functional manifestations.

## **Clinical phenotyping of children with nocturnal enuresis: A critical review-based proposal**

### **Abstract**

Nocturnal enuresis (NE) is an extremely common condition in childhood and is known for its heterogeneous pathophysiological mechanisms, multifactorial aetiology, course of progression/remission and varied treatment response. Evidence from basic science and clinical practice has shown that NE is not an isolated phenomenon of urinary loss during sleep but encompasses a set of conditions related to different systems, which significantly impact the quality of life and development of children. The accurate recognition of these conditions allows for a better understanding of the pathophysiological mechanisms and greater assertiveness in the assessment and therapeutic choices for NE. The aim of this study is to propose a phenotyping model for children with NE based on the contemporary evidence of clinical, physiological, and functional manifestations.

**Keywords:** 1.nocturnal enuresis 2.child 3.phenotype 4.phenotyping 5.review

### **INTRODUCTION**

Nocturnal enuresis (NE) is defined by the International Children's Continence Society (ICCS) as the involuntary loss of urine during sleep in individuals five years of age or older, occurring at least twice a week for more than 3 months, after excluding organic causes(1).

It is a common condition in preschool children, leading to a large number of consultations with paediatricians. The NE prevalence is approximately 10% in children aged 7 years, 3% in adolescents and 1% in adults(1,2,3), with a spontaneous yearly remission rate of approximately 15%.

Evidence from basic science and clinical practice has shown that NE is not an isolated phenomenon of urinary losses during sleep. The aetiology is multifactorial, and the pathophysiological mechanisms are heterogeneous.

Among factors shown to be involved with NE in children are genetic and hereditary(4,5,6), central nervous system (CNS) maturation(7–14,15,16), behavioural changes(17), sleep(18–28), respiratory(29,30), gastrointestinal(31,32), cardiovascular, hormonal and metabolic disorders(33,34), learning deficits(35), delayed bone maturation(36–38), spatial and visual-motor perception(39), motor coordination(40), and posture and balance deficits(41). These various factors have been widely explored in isolation, but the delay in CNS maturation seems to be the common ground that integrates most of these components.

The recognition of these different components and their interrelationships may improve our understanding of the pathophysiology of NE and allow for individualized clinical assessment and treatment selection. The aim of this study is to propose a phenotyping model for children with NE based on the contemporary evidence of clinical, physiological, and functional manifestations.

### **METHODS**

The study is a proposal for the elaboration and validation of a phenotyping model for EN that will be based on an analytical and methodological review that will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols

(PRISMA-P)(42) and has been registered in the International Prospective Register of Systematic Reviews (PROSPERO) (CRD42021276687).

### ***Literature search strategy***

A previous search was conducted using the PROSPERO and Cochrane Central Register of Controlled Trials databases to avoid duplication of potential reviews. This protocol aims to identify the most recent updates about enuresis and its manifestations, without language or date limitations. The PubMed, Embase, Web of Science, Lilacs and Cochrane Library electronic databases were searched from May 2021 until September 2021 for all published studies written in English in the last 10 years. The search strategies were built as follows: (((nocturnal enuresis) OR (enuresis)) AND (urinary incontinence\*) (lower urinary tract symptoms\*) (overactive bladder\*) (post void residual\*) (dysuria\*) (urinary retention\*) (feeling of incomplete emptying\*) (post micturition dribble\*) (bladder pain\*) (holding maneuvers\*) (Intermittency\*) (hesitancy\*) (straining\*) (weak stream\*) (constipation\*) (fecal incontinence\*) (bladder bowel dysfunction\*) (rhinitis\*) (asthma\*) (sleep apnea\*) (allergies\*) (respiratory problems\*) (respiratory disorders\*) (central nervous system\*) (brain\*) (brain disorders\*) (maturation\*) (neural pathways\*) (neurodevelopmental disorders\*) (sleep\* OR sleep disorders\*) (snoring\*) (polysomnography\*) (parasomnia\*) (blood pressure\*) (hypertension\*) (autonomic nervous system\*) (autonomic control\*) (hormonal disorders\*) (hormonal\*) (renin angiotensin aldosterone\*) (vasopressin\*) (obesity) (diabetes insipidus\*) (genetics\*) (chromosomes\*) (hereditary\*) (sensorial disorders\*) (neuromotor\*) (posture\*) (balance\*) (postural control\*) (coordination\*) (psychomotor\*) (neurodevelopmental\*) (neurodevelopmental disorders\*) (cognitive disorder\*) (autism spectrum\*) (attention deficit hyperactivity disorder\*) (oppositional defiant disorder\*) (anxiety\*) (depression\*) (learning disorders\*) (learning difficulty\*) (self esteem\*) (Social exclusion\*) (abuse\*) (psychological disorders\*) (learning\*) AND (children\*))

### ***Selection of articles and data extraction***

#### ***Types of study***

Systematic reviews and case–control, cross-sectional, descriptive-analytical, longitudinal and cohort studies will be selected for this review.

#### ***Eligibility criteria***

Only full studies that report the main clinical, physiological, and functional manifestations in children with NE will be included. To guide the proper identification of relevant studies, the PICOS eligibility criteria will be considered: Population (children with NE); Intervention (evaluation of children and adolescents with NE); Comparators (children and adolescents without nocturnal enuresis); and Outcomes (identification of the main clinical, physiological, and functional manifestations) and any outcome measures.

#### ***Inclusion criteria***

Study designs describing the main clinical, physiological, and functional manifestations in children with nocturnal enuresis, according to International Children's Continence Society (ICCS) criteria, will be considered for inclusion in the review.

#### ***Exclusion criteria***

Studies addressing other lower urinary tract symptoms in children or studies with adults will be excluded from this review.

#### ***Selection of articles***

The study selection and data extraction will be performed independently by 2 researchers. The selection of studies will include a preliminary screening by the title and abstract, a full-text reading, an assessment of the methodological quality and eligibility, and a careful



analysis of the literature. Duplicated articles will be removed, and the full reports of eligible studies will be selected according to the inclusion criteria. If there were disagreements regarding the selection and evaluation of studies, a third researcher/reviewer will be consulted.

#### ***Data extraction***

The studies that meet the inclusion criteria will be analysed, and the following data will be extracted: author, year of publication, country where the study was conducted, total number of people included in the study, type of study, assessment tools for nocturnal enuresis, assessment tools for associated conditions and main results. This information will be recorded in an online Excel spreadsheet (Google drive). Two reviewers will assess the quality and risk of bias of the studies using the Downs & Black Checklist. Disagreements between reviewers will be resolved by consulting the third reviewer.

#### ***Data synthesis***

The findings from this review will be reported in descriptive data and shown as a narrative. The main data will be the clinical, physiological, and functional manifestations in children with NE.

#### ***Categorization of the clinical, physiological, and functional manifestations associated with enuresis***

##### ***Categorization of domains and validation by the expert committee***

After a thorough reading and analysis of the literature, the clinical, physiological, and functional manifestations associated with enuresis will be categorised into domains and submitted for analysis by an expert committee with extensive experience in their respective areas of expertise, through an online meeting on the Google Meet platform.

The electronic form will contain a list of all manifestations and their relationships with the respective domain, using a Likert scale with a score from 1 to 5, with 1 being 'strongly disagree' and 5 being 'strongly agree'. After completing the form, all committee members will be invited to analyse the results of the level of agreement of the items for which Kappa coefficient criteria will be considered (Table 1). The kappa statistic is frequently used to test interrater reliability. The importance of interrater reliability is that it represents the extent to which the data collected in the study are correct representations of the variables measured. The measurement of the extent to which data collectors (raters) assign the same score to the same variable is called interrater reliability(43).

Table 1 - Kappa value interpretation

<b>Pointing</b>	<b>Interpretation</b>
0	No agreement
0-0.19	Light
0.20-0.39	Fair
0.40-0.59	Moderate
0.60-0.79	Substantial
0.80-1.0	Perfect

In addition to the agreement analysis, all the considerations and suggestions made by the committee will be organised to compose the final results and the phenotyping model.

## OUTCOMES

The primary outcome of this study will be a systematic, analytical, and methodological review of the literature and proposal for categorising the associated manifestations of NE into domains. Based on the review, we shall find recent publications that will allow us to broadly analyse the most relevant clinical, physiological, and functional manifestations associated with NE. From there, we will seek to identify similarities between the manifestations that allow us to find a criterion to group them into domains. Once grouped, we expect that the proposed categorization will be clear and intelligible enough for a committee of experts to evaluate and validate. It should also be easily understood by different professionals working with children with NE.

The secondary outcome will be the development and validation of a physiological, clinical, and functional phenotyping model of NE. Based on the analysis of the committee, graphic representation of the NE phenotyping model will be developed. Also, we intend to develop a NE phenotyping scoring system based on the different domains, that might help healthcare professionals to direct evaluation and treatment.

## DISCUSSION

The heterogeneity of NE and the associated manifestations are widely known and described in the literature, but we are not aware of the existence of a phenotyping model that maps the scenario and its relationships. To our knowledge, this is the first study that presents a proposal for the phenotyping of NE.

Considering the high prevalence of NE worldwide and the negative impact on all aspects of these children's lives, harming their development, we believe that the results of this study will make important contributions to the clinical field, guide future studies, and encourage more proposals of interdisciplinary approaches for treating children with NE.

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**Artigo 2 - Clinical phenotyping of children with nocturnal enuresis: a key classification to approach improvement**

**Journal of Pediatric Urology**  
**Clinical phenotyping of children with nocturnal enuresis: a key classification to approach improvement**  
 –Manuscript Draft–

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<b>Article Type:</b>	Review Article
<b>Keywords:</b>	1.Nocturnal enuresis 2.Child 3. Bibliometric 4.Phenotyping 5.Review
<b>Corresponding Author:</b>	Rita Pavione Rodrigues Pereira FMUSP: Universidade de Sao Paulo Faculdade de Medicina São Paulo, São Paulo BRAZIL
<b>First Author:</b>	Rita Pavione Rodrigues Pereira, Master
<b>Order of Authors:</b>	Rita Pavione Rodrigues Pereira, Master Aline Mari Mazzali Pessoa Martins, Bachelor Luana Daniele Kel de Souza, Bachelor Isabela Teixeira Mendes de Carvalho, Bachelor Patrícia França, Master Cristiano Mendes Gomes, Doctor Rejane de Paula Bernardes, Doctor Karine Furtado Meyer, Doctor Eliane Maria Garcez Oliveira Fonseca, Doctor Marcos Giannetti Machado, Doctor Clarice Tanaka, PhD
<b>Abstract:</b>	Introduction: Evidence shows the NE not as an isolated phenomenon of urinary loss during sleep, but encompassing a set of systemic manifestations which significantly impact children's quality of life and development. In fact, the NE is currently known for its heterogeneous pathophysiological mechanisms, multifactorial aetiology, course of progression/remission, and varied response to treatment. However, the understanding of the clinical and physiological relationship of these systemic manifestations still is a challenge. Knowing details from NE literature such as how, which or how often these manifestations appear related to NE, may provide better insights of integrated clinical manifestations, allowing the categorization in domains and phenotyping model development. Objective: The aim of this study is to develop a phenotyping model for children with NE based on evidence. Methods: This study is based on an analytical and methodological review of the literature, carried out from May 2022 to September 2022, about EN and its associated clinical manifestations. A bibliometric analysis was carried out to better analyse outcomes. After reading and analysing the literature, the clinical manifestations were categorised into domains and submitted to the validation of an expert committee with extensive experience in their specific area of expertise. The visual representation of the categorised model was developed to aim for the phenotyping concept easily understood to all professionals. Results: The clinical manifestations found related to NE have the categorization and thereafter the validation by the expert committee. And then, the development of the phenotyping model for children with NE. Conclusion: This study enabled the development of a phenotyping model for children with NE based on evidence that will make important contributions to the clinical field and future studies.
<b>Suggested Reviewers:</b>	Wendy F Bower Doctor, The University of Melbourne wendy.bower@mh.org.au excellent researcher in the area, with a lot of familiarity with the subject

## **Clinical phenotyping of children with nocturnal enuresis: a key classification to approach improvement**

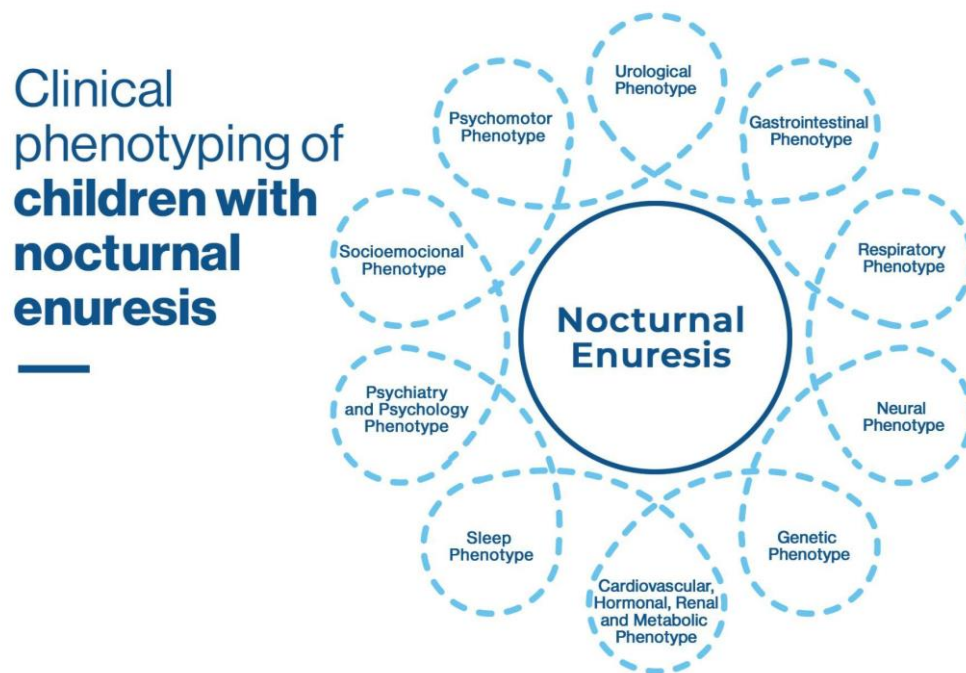
### **ABSTRACT**

**Introduction:** Evidence shows the NE not as an isolated phenomenon of urinary loss during sleep, but encompassing a set of systemic manifestations which significantly impact children's quality of life and development. In fact, the NE is currently known for its heterogeneous pathophysiological mechanisms, multifactorial aetiology, course of progression/remission, and varied response to treatment. However, the understanding of the clinical and physiological relationship of these systemic manifestations still is a challenge. Knowing details from NE literature such as how, which or how often these manifestations appear related to NE, may provide better insights of integrated clinical manifestations, allowing the categorization in domains and phenotyping model development.

**Objective:** The aim of this study is to develop a phenotyping model for children with NE based on evidence. **Methods:** This study is based on an analytical and methodological review of the literature, carried out from May 2022 to September 2022, about EN and its associated clinical manifestations. A bibliometric analysis was carried out to better analyse outcomes. After reading and analysing the literature, the clinical manifestations were categorised into domains and submitted to the validation of an expert committee with extensive experience in their specific area of expertise. The visual representation of the categorised model was developed to aim for the phenotyping concept easily understood to all professionals. **Results:** The clinical manifestations found related to NE have the categorization and thereafter the validation by the expert committee. And then,

the development of the phenotyping model for children with NE. **Conclusion:** This study enabled the development of a phenotyping model for children with NE based on evidence that will make important contributions to the clinical field and future studies.

Figure - Clinical phenotyping model of children with nocturnal enuresis



**Keywords:** 1.Nocturnal enuresis 2.Child 3. Bibliometric 4.Phenotyping  
5.Review



## **INTRODUÇÃO**

Nocturnal enuresis (NE) is an extremely common condition during childhood, reported since ancient times in different cultures and, for a long time, was understood to be a psychiatric disorder(1,2). In recent decades with the increase in number of studies on pathophysiology and pathogenesis, the evidence has been showing that NE is not an isolated phenomenon of urinary loss during sleep, but an entity of multifactorial aetiology and heterogeneous mechanisms, which presents itself with a series of clinical manifestations and repercussions in different systems, although the relationship between them is still not evidently clear(3–7).

The recognition of these manifestations and the detailed frequency and co-occurrence, can allow categorization into domains and provide better insights into integrated clinical manifestations, facilitating the understanding of pathophysiological mechanisms and promoting greater assertiveness in assessment and in choosing adequate therapies. In addition, the grouping of these manifestations will contribute to the strengthening of the integrated and holistic view that has been developed regarding NE in recent years. Therefore, the aim of the present study is to develop an evidence-based clinical phenotyping model of children with the condition.

## **METHODS**

The study in matter is a proposal for the elaboration and validation of a phenotyping model for EN, based on analytical and methodological review that followed the Preferred Reporting Items for Systematic Reviews, complemented through a bibliometric analysis of the literature. It has been registered in the

International Prospective Register of Systematic Reviews (PROSPERO) (CRD42021276687).

***Analytical and methodological review of the literature***

The PubMed, Embase, Web of Science, Lilacs and Cochrane Library electronic databases were searched from May 2022 until September 2022 for all published studies written in English in the last 10 years. The search strategies were built as follows: (((nocturnal enuresis) OR (enuresis)) AND (urinary incontinence) (lower urinary tract symptoms) (overactive bladder) (post void residual) (dysuria) (urinary retention) (feeling of incomplete emptying) (post micturition dribble) (bladder pain) (holding maneuvers) (intermittency) (hesitancy) (straining) (weak stream) (nocturnal polyuria) (constipation) (fecal incontinence) (bladder bowel dysfunction) (rhinitis) (asthma) (sleep apnea) (allergies) (respiratory problems) (central nervous system) (brain) (brain disorders) (maturation) (neural pathways) (neurodevelopmental disorders) (sleep OR sleep disorders) (snoring) (polysomnography) (parasomnia) (blood pressure) (hypertension) (snoring) (autonomic nervous system) (hormonal disorders) (hormonal) (renin angiotensin aldosterone) (vasopressin) (obesity) (diabetes insipidus) (genetics) (chromosomes) (hereditary) (sensorial disorders) (neuromotor) (posture) (balance) (postural control) (coordination) (neurodevelopmental) (cognitive disorder) (autism spectrum) (attention deficit hyperactivity disorder) (oppositional defiant disorder) (anxiety) (depression) (learning) (self esteem) (social exclusion) (abuse) (psychological disorders) (learning) AND (children))

Systematic reviews and case–control, cross-sectional, descriptive-analytical, longitudinal and cohort studies were selected for this review. Only full

studies that report the main clinical manifestations present in children with NE according to International Children's Continence Society (ICCS) criteria were included in the review. To guide the proper identification of relevant studies, the PICOS eligibility criteria considered: Population (children with NE); Intervention (evaluation of children and adolescents with NE); Comparators (children and adolescents without nocturnal enuresis); and Outcomes (identification of the main clinical manifestations) and any outcome measures. Studies addressing other lower urinary tract symptoms or studies involving adults will be excluded from this review.

The study selection and data extraction were performed independently by two researchers. The selection of studies included a preliminary screening by the title and abstract, a full-text reading, an assessment of the methodological quality and eligibility and a careful analysis of the literature. Duplicates were excluded and the full reports of eligible studies were selected according to the inclusion criteria. If there were any disagreements regarding the selection and evaluation of studies, a third researcher/reviewer was consulted.

The studies that meet the inclusion criteria were analysed and the following data was extracted: author, year of publication, country where the study was conducted, total number of people included in the study, type of study, assessment tools for nocturnal enuresis, assessment tools for associated conditions and main results. This information was recorded in an online Excel spreadsheet (Google drive). Two reviewers were assessed on the quality and risk of bias of the studies using the Downs & Black Checklist. Disagreements between reviewers were resolved by consulting the third reviewer. The findings were

reported in descriptive data and shown as a narrative. The main data from this review were the clinical manifestations present in children with NE.

### ***Bibliometric Analysis***

To complement the analytical and methodological review, a bibliometric analysis(8) of the literature was carried out in this study. The global literatures about NE published between 2012 to 2022 were scanned in the Medline/Pubmed collection database. The search strategies were built as follows: (((nocturnal enuresis) OR (enuresis)) AND (child)) which was used as the keyword in the title. The information of the documents that meet the requirements contained year of publication, language, journal, title, author, affiliation, keywords, document type, abstract and counts of citation which were exported into simple text format (txt.). The retrieval date was September 30th 2022. VOSviewer (version 1.6.18) was used to analyse the Co-occurrence, Bibliographic coupling and Themes. Publications not related to NE were excluded from the study.

### ***Categorization of clinical manifestations present in enuresis and validation by the expert committee***

After a thorough reading and analysis of the literature, the clinical manifestations present in enuresis were categorised into domains and submitted to the analysis of an expert committee composed of 5 members: one urologist, two paediatric urologists and two paediatric nephrologists, with extensive experience in their respective areas of expertise. The committee took part in an online meeting on the Google Meet platform, alongside the responsible researchers and a data analyst.

The electronic form contained a list of all manifestations and the relationship with the respective domain, using the Likert scale with a score from 1 to 5, with 1 being 'strongly disagree' and 5 'strongly agree'. After completing the form, all committee members were invited to an analysis of the results regarding the level of agreement of the items for which Kappa Coefficient criteria was considered (Table A1). The kappa statistic is frequently used to test interrater reliability. The importance of rater reliability lies in the fact that it represents the extent to which the data collected in the study are correct representations of the variables measured. Measurement of the extent to which data collectors (raters) assign the same score to the same variable is called interrater reliability(9).

#### TABLE A1

In addition to the agreement analysis, all the considerations and suggestions made by the committee were organised to compose the final results and the phenotyping model. The graphic representation of this model was developed by a designer, with the aim of making the concept intelligible to all professionals who participate in the care of these children.

## **RESULTS**

The aim of this study was to develop an evidence-based model of clinical phenotyping of children with NE.

The analytical and methodological review of the literature reported 536 articles, of which 241 were duplicates, 97 did not meet the inclusion criteria, 85 were excluded by title and 37 excluded by abstract. In total 76 were included for analysis and full reading. The result of the review showed the main scenarios and

clinical manifestations present in NE, which can also be observed in the bibliometric analysis of the literature.

Network map of the trend topics according to the keywords used from 2012 to 2022 in the studies about NE, brought a total of 2545 unique terms recorded in the articles, but only the top 744 terms were included to generate the co-occurrence network and thus to achieve adequate readability. The size of the circles represents the frequency of appearance as the keywords. The distance between the two circles indicates their correlation. A total of five interconnected clusters were observed, including a main cluster of NE and neural manifestations (yellow). The red cluster involves the psychological, psychiatric and socioemotional manifestations. The green cluster represents respiratory and sleep disorders. The blue cluster shows the urological and gastrointestinal manifestations and the purple cluster indicates the cardiovascular, hormonal, renal and metabolic manifestations (Figure A1).

#### FIGURE A1

The result of the review and bibliometric analysis enabled researchers to categorise these manifestations into domains; potential NE phenotypes, in addition to providing an overview of possible correlations between all these aspects (Figure A2 and Figure A3).

#### FIGURE A2 and A3

## **DISCUSSION**

To our knowledge, this is the first study that presents a model for the clinical phenotyping of children with NE an evidence-base, although many research groups are dedicated to the in-depth study of each of the clinical manifestations present in the NE and there is a great effort by the International Children's Continence Society (ICCS) in the construction of guidelines for the standardisation of terms and conduct in the area over the last few years.

In the present study, the results of the comprehensive literature review and the bibliometric support the premise that NE is not a single condition, but a complex and heterogeneous disorder in which multiple pathogenic factors are involved, which may explain the various clinical manifestations present, related or not in the different subtypes.

At the centre of the debate, there are children who not only wet the bed during sleep, but may also present other clinical manifestations, such as urological (in the ENNM subtype)(1,10,11), gastrointestinal(1,12), psychiatric and psychological manifestations(1,13–15), socio-emotional manifestations(2,6,7,16), genetic and hereditary component(17,18), neural findings and neurodevelopmental disorders(3,5,19,20), sleep disorders(3,21–23), respiratory manifestations(24–27), renal, cardiovascular, hormonal,metabolic disorders (28–30), and psychomotor manifestations(31–34).

The observation of these main clinical scenarios (Figure 3) shows systemic manifestations that seem to have a common link. Are they all related/connected? Is there one system that prevails over the other and compromises the hierarchy of control? There are several attempts to explain this phenomenon and understand the existing correlations, but it is not known whether these manifestations are cause or consequence, independent or

concomitant in the same event. There is a baseline: nocturnal urinary loss. But is there a predominance? What is the weight of each of these manifestations after all?

It seems that the recognition and grouping of these manifestations is a first step towards answering these questions. Similar clustering models, known as phenotyping models, have been proposed to facilitate the construction of the clinical diagnosis and direct the approach of other pathologies, such as: asthma(35), chronic pelvic pain syndrome(36), obstructive sleep apnea(37), chronic kidney disease(38), among others. From a clinical phenotyping point of view, the identification of factors that may group patients in terms of clinically relevant outcomes will enable the understanding of the disease's mechanisms, prognosis/response to therapy, and risk of adverse events(16).

For this reason, we believe that the clinical phenotyping model of children with EN, presented in this study, can bring benefits to the area, as it can develop better understanding of pathophysiological mechanisms. In addition, the graphic representation is clear, intelligible and clinically relevant, and can be easily understood by different professionals who will conduct the assessment and therapeutic approach for each child with greater assertiveness. Linking phenotypes to significant longitudinal outcomes can facilitate their selection and refinement (for example, NE related to psychomotor factors) and bring about functional and patient-centred(39) outcomes and can capture important phenotypes that would otherwise be missed in a conventional assessment.

According to the results of the co-occurrence network analysis, five highly connected clusters were observed. The main cluster (yellow) was NE connected



to terms related to gene expression, central nervous system, brain, brain mapping, thalamus. The next highly connected cluster (blue) includes urinary and gastrointestinal symptoms, such as urinary incontinence, daytime urinary incontinence, voiding dysfunction, overactive bladder, urination disorders, urgency, urinary tract infection, nocturia, fecal incontinence and constipation. The third cluster (red) involves studies about the psychological, psychiatric and socioemotional manifestations, such as cognition disorders, child development, attention deficit, hyperactivity, stress, anxiety, depression, affective symptoms, autism spectrum disorders and intellectual disabilities, highly reported conditions in children with NE. The fourth cluster (green) showed studies on respiratory and sleep disorders related to NE, such as obstructive sleep apnea, parassomnias, allergic rhinitis, snoring, polysomnographic findings among others. The fifth cluster (purple) showed the connection between NE with the several cardiovascular, hormonal, renal and metabolic manifestations. Overall, the identified clusters are consistent with what is known about NE research.

It is interesting to observe on the map that the clusters and the manifestations have strong connections with each other, in addition to having NE as a common point, which justifies the overlapping of manifestations in children with SEN and, therefore, the need for a more integrated look from the professionals who are involved in the care line.

Longitudinal studies in populations of children with NE will be needed to validate a scoring system that ranks NE phenotypes according to likely etiological mechanisms, which will help guide the therapeutic approach. The application of advanced analytical methods and machine learning approaches such as analysis

of scoring results can be important for substantiating the prevalence of manifestations, for phenotypic classification, for understanding the interaction of important traits in the pathogenesis of EN and for data integration between levels to identify the interrelationships of phenotypes(40).

Considering the high prevalence of EN worldwide and the negative impact on all aspects of the lives of these children and their families, we believe that the results of this study make important contributions to the clinical field, open precedents for future research within this perspective and encourage more proposals of interdisciplinary approaches for treating children with NE.

## **CONCLUSION**

This study enabled the development of a phenotyping model for children with NE based on evidence that will make important contributions to the clinical field and its future studies.

## **CONFLICT OF INTEREST**

Nil.

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None.

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Figure A1 - Bibliometric analysis of themes. A co-occurrence network of “Keywords” from original articles on nocturnal enuresis from 2012 to 2022.

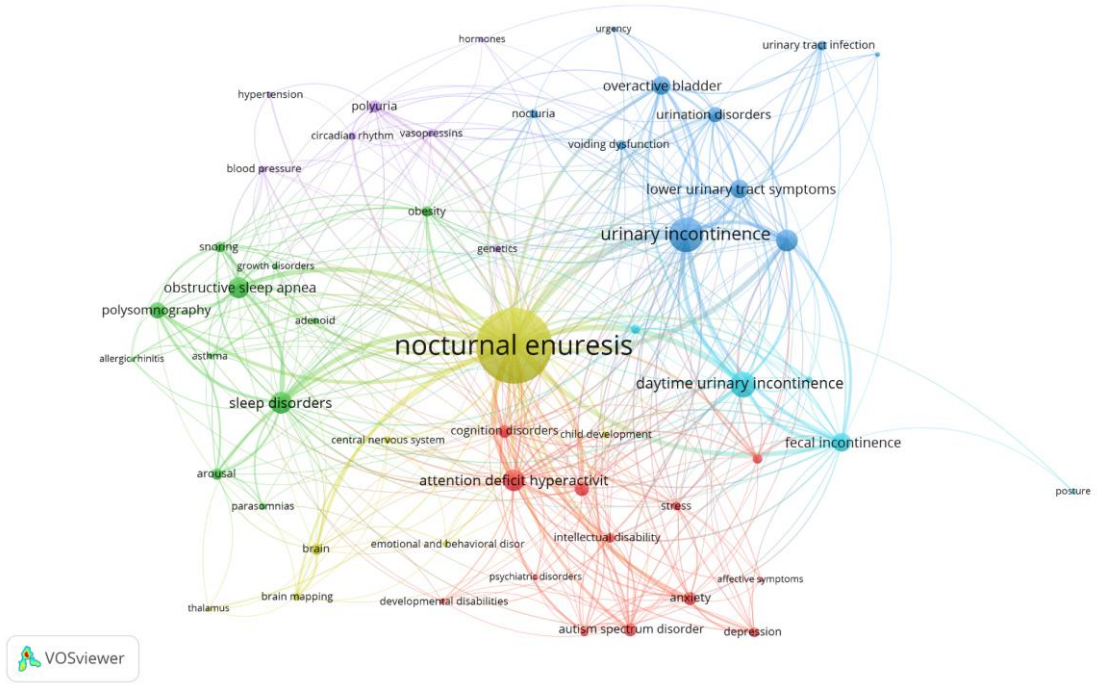


Figure A2 - Clinical phenotyping model of children with nocturnal enuresis

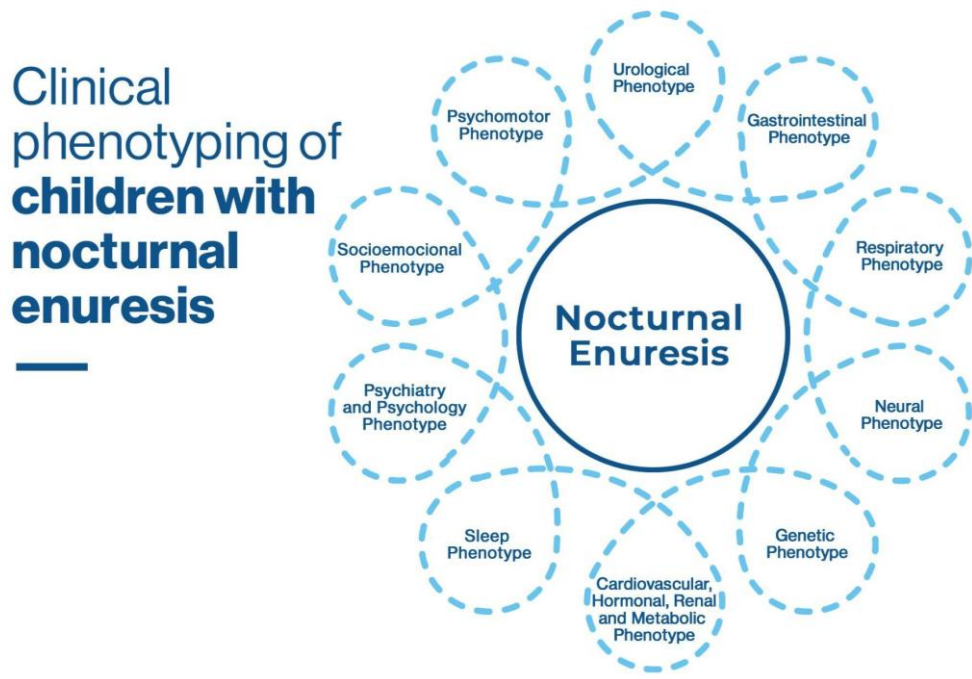


Figure A3 - Main clinical scenarios observed in the clinical phenotyping model of children with nocturnal enuresis

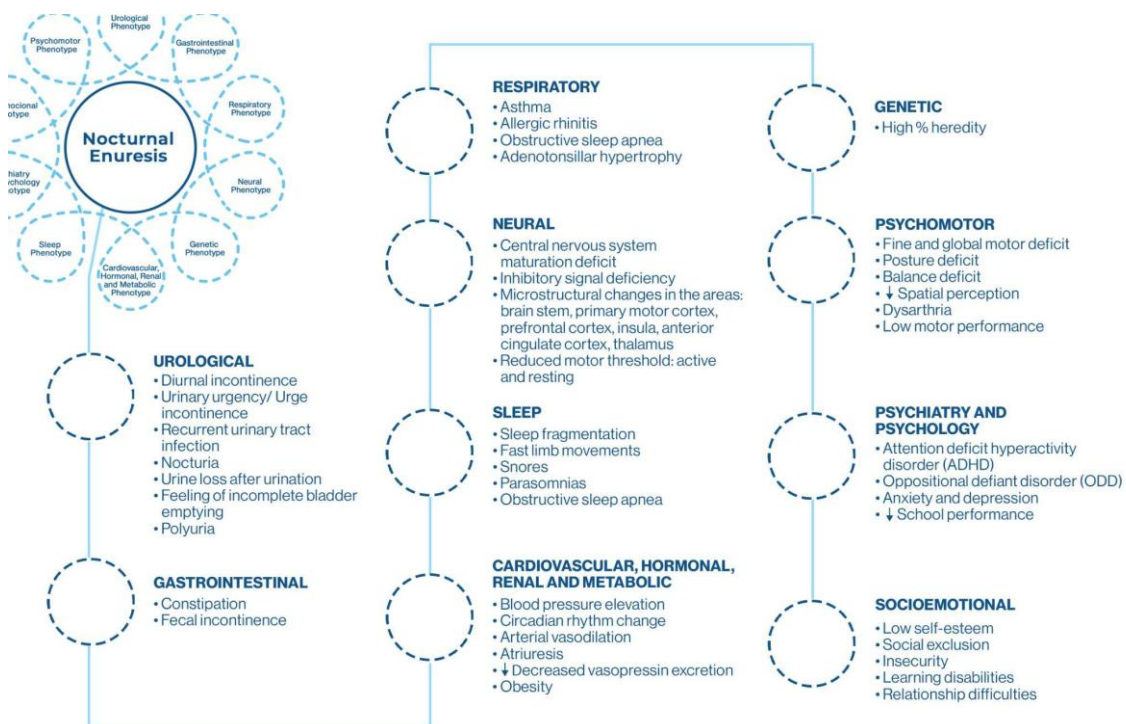


Table A1 - Kappa value interpretation

Pointing	Interpretation
0	No agreement
0-0.19	Light
0.20-0.39	Fair
0.40-0.59	Moderate
0.60-0.79	Substantial
0.80-1.0	Perfect

## Artigo 3 - Pediatric Incontinence Questionnaire (PINQ): Translation and transcultural adaptation to Brazilian Portuguese

Decision on submission to Jornal de Pediatria - JPEDIATRIA-D-22-00110R2



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**Pediatric Incontinence Questionnaire (PINQ): Translation and transcultural adaptation to Brazilian Portuguese**

Prezada Sra. Rita Pereira,

Informamos com satisfação que seu artigo foi aceito para publicação e está programado para a edição nº 4 (Jul/Ago), ano de 2023, Volume 99 do Jornal de Pediatria. Essa programação ainda pode ser alterada de acordo com a necessidade da Editora, entretanto, o artigo será publicado "no prelo" bem antes desta data. Seguem abaixo algumas informações finais:

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- Este é um bom momento para que os autores revisem os nomes e filiações, para evitar erros.

- Enviar a **figura 1** em word ou outro formato editável (jpeg,gif,etc)

### Jornal de Pediatria Pediatric Incontinence Questionnaire (PINQ): Translation and transcultural adaptation to Brazilian Portuguese –Manuscript Draft–

Manuscript Number:	JPEDIATRIA-D-22-00110R2
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Keywords:	Bladder dysfunction; child; urinary incontinence; Quality of life, Questionnaires
Corresponding Author:	Rita Pavione Rodrigues Pereira, M.D BRAZIL
First Author:	Rita Pavione Rodrigues Pereira, M.D
Order of Authors:	Rita Pavione Rodrigues Pereira, M.D Angélica Quintino Leirão Gabriella da Silva Fotakos Jocera Neves dos Reis Flávio Trigo Rocha Marcos Giannetti Machado Wendy F Bower Clarice Tanaka
Abstract:	<p><b>Introduction:</b>Lower urinary tract symptoms (LUTS) affects approximately 10% of children worldwide and are related to psychosocial manifestations and compromised quality of life, both for children and their families. The assessment of emotional conditions of LUTS in children is recommended by International Children's Continence Society; however, there is no specific instrument in the Brazilian Portuguese language. Therefore, the aim of this study was to translate, culturally adapt and assess the internal consistency of the Brazilian Portuguese version of the Pediatric Incontinence Questionnaire (PINQ).</p> <p><b>Material and methods:</b>This cross-sectional study was performed at two referral centers for childhood voiding dysfunction. The 20-item PINQ was translated into Brazilian Portuguese and culturally adapted according to Beaton, 2000. His standard methodology consists of 6 phases: translation, synthesis, back-translation, expert committee, and pre-test. The internal consistency was assessed using Cronbach's alpha.</p> <p><b>Results:</b> The PINQ-br version was developed, validated by a committee of experts and pre-tested on 44 children diagnosed with lower urinary tract symptoms, 23 boys and 21 girls (mean age: 9.7 and 9.6 years old respectively), as well as on their parents. The internal consistency was considered satisfactory, reaching the Cronbach's alpha coefficient of 0.74 when applied to children and 0.82 when applied to parents.</p> <p><b>Conclusions:</b> The PINQ was translated and culturally adapted to Brazilian Portuguese to assess the impact of LUTS on the health-related quality of life in Brazilian children and adolescents.</p>
Suggested Reviewers:	Eliane Maria Garcez Oliveira da Fonseca Garcez Oliveira da Fonseca, PhD fonsecaeg@gmail.com
Opposed Reviewers:	
Response to Reviewers:	



## **Pediatric Incontinence Questionnaire (PINQ): Translation and transcultural adaptation to Brazilian Portuguese**

### **Abstract**

**Introduction:** Lower urinary tract symptoms (LUTS) affects approximately 10% of children worldwide and are related to psychosocial manifestations and compromised quality of life, both for children and their families. The assessment of emotional conditions of LUTS in children is recommended by International Children's Continence Society; however, there is no specific instrument in the Brazilian Portuguese language. Therefore, the aim of this study was to translate, culturally adapt and assess the internal consistency of the Brazilian Portuguese version of the Pediatric Incontinence Questionnaire (PINQ).

**Material and methods:** This cross-sectional study was performed at two referral centers for childhood voiding dysfunction. The 20-item PINQ was translated into Brazilian Portuguese and culturally adapted according to Beaton, 2000. His standard methodology consists of 6 phases: translation, synthesis, back-translation, expert committee, and pre-test. The internal consistency was assessed using Cronbach's alpha.

**Results:** The PINQ-br version was developed, validated by a committee of experts and pre-tested on 44 children diagnosed with lower urinary tract symptoms, 23 boys and 21 girls (mean age: 9.7 and 9.6 years old respectively), as well as on their parents. The internal consistency was considered satisfactory, reaching the Cronbach's alpha coefficient of 0.74 when applied to children and 0.82 when applied to parents.

**Conclusions:** The PINQ was translated and culturally adapted to Brazilian Portuguese to assess the impact of LUTS on the health-related quality of life in Brazilian children and adolescents.

**Keywords:** Bladder dysfunction; Child; Urinary incontinence; Quality of life, Questionnaires

## **Introduction**

The lower urinary tract symptoms (LUTS) is a common problem in childhood and corresponds to 40% of visits to a pediatric urologist. It is estimated that LUTS is present in 10% of children worldwide(1,2) and in 24.2% of Brazilian children between 3 to 9 years of age(3).

There is a great variability in the clinical presentation of LUTS characterized by several urinary symptoms, including daytime urinary incontinence, bedwetting, voiding dysfunction, post voiding residual, vesicoureteral reflux, urinary tract infection, associated in most cases with gastrointestinal disorders such as fecal constipation and/or incontinence (1).

The LUTS etiology is multifactorial and it is strongly related to behavioral, sleep, respiratory, hormonal and metabolic disorders, obesity, learning deficit, alteration of visuomotor perception, coordination disorders, posture and balance(4–12). Also, has an important psychosocial impact, with manifestations of low self-esteem, insecurity, slow school performance and social exclusion, factors that considerably compromise the general development and the health related quality of life (HRQOL) of children, adolescents and their families(13,14).

The International Children's Continence Society (ICCS) recommends assessing the impact of LUTS in the HRQOL of children and adolescents, however in Brazil, there is no Brazilian Portuguese language instrument to measure HRQOL specifically for LUTS. Therefore, the aim of this study was to translate, culturally adapt and assess the internal consistency of the Brazilian Portuguese version of the Pediatric Incontinence Questionnaire (PINQ).

## **Materials and methods**

This multicenter cross-sectional study report followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) reporting guidelines (<https://www.strobe-statement.org/>). Was carried on Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo and Hospital Municipal Infantil Menino Jesus, two centers referenced in pediatric care.

The population was children outpatients with diagnosed with LUTS by Dysfunctional Voiding Symptom Score (DVSS)(15) screening in the age range of 6–16 years old and their legal guardians who signed a consent form approved by the Ethics Committee of this hospital (CAPPesq nº 2.179.498, CAAE 70682317.5.0000.0068). The DVSS is an objective score system for disorders voiding in the children, validated in brazil(16). Includes 10 quantitative and qualitative urological questions, and has been used as an objective instrument to grade voiding dysfunction in this population. Children with anatomical changes in the urinary tract, genetic syndromes, neurological conditions or cognitive impairments were not included in the study.

The Pediatric Incontinence Questionnaire (PinQ)(1), developed and tested by Dr Wendy Bower et.al (17–19) at the Chinese University of Hong Kong, China in 2006. The instrument is a simple and easy-to-apply 20-question questionnaire, scoring from 0 “No” and 4 “Always” on a Likert scale, with a total of 80 points in which the higher the score, the greater impact of LUTS in the HRQOL. The original instrument was written in English, available in self-applicable and proxy versions. There is also a German version adapted by Bachmann et. all composed for 21 questions, scoring from 0 “No” and 4 “Always” on a Likert scale, with a total of 84 points in which the higher the score the greater the impact of LUTS in the HRQOL(20).

Dr. Wendy Bower, has authorized the translation and cross-cultural adaptation of the Pediatric Incontinence Questionnaire (PINQ) into Brazilian Portuguese. The process of translation and cross-cultural adaptation followed the model used by Beaton (21), composed of 6 stages (Figure 1).

#### FIGURA 1

Once the translations were performed, the two translations were discussed and merged into the v.PINQ1, which was back-translated, creating the v.PINQ2.

The v.PINQ 2 was submitted to the appraisal of the expert committee composed of one pediatric urologist; four physiotherapist experts in pediatric urology and one Portuguese teacher, who met face-to-face to analyze the content validity, conceptual equivalence, language adequacy related to the semantics/idiomatics and culture of each item, comparing the original instrument and the v.PINQ 2, ensuring the best fit with the context and experiences of Brazilian children. The items were considered to be in good agreement by the Committee when the percentage of agreement was approximately 90%. The adaptation suggestions were successfully consolidated reaching the content, semantic, idiomatic, experiential, and conceptual equivalence and resulted in v.PINQ 3.

The v.PINQ 3 was submitted to pretesting and applied to children with LUTS and their families, to verify the cultural adaptation and internal consistency of the instrument. The application time was varied from 10 to 15 minutes, similarly to that predicted by the developer. The expert committee analyzed the pretesting data that showed the need for small changes in words and expressions, which

didn't compromise the content, and a new pretest was not necessary. Thus, PINQ-br was obtained and had the approval of the developer.

Standard statistical software (IBM SPSS, version 19.0, Armonk, New York, USA) was used for data analysis. A descriptive analysis was performed to characterize the sample, and Cronbach's alpha coefficient was applied to verify the internal consistency of the instrument. Cronbach's alpha values  $>0.70$  were considered as evidence of satisfactory internal consistency(22).

## **Results**

The expert committee that analyzed the translations has pointed to correspondence between the translated items, semantic equivalence between the two translations and no difficulty in interpreting the translated versions. Marginal adjustments were made to facilitate understanding and better adaptation to Brazilian culture.

Regarding the options of Likert scale, the committee has chosen more suitable words for childhood language: (0) "no" = "não"; (1) "hardly ever" = "quase nunca"; (2) "sometimes" = "as vezes"; (3) "Often" = "quase sempre", and; (4) "all the time" = "sempre". For the self-applicable version of PINQ-br, it was considered always using the pronouns "eu" ("I") and "meu" ("mine") for example "Eu estou preocupado..." ("I am worried..."); "...por causa do meu problema de bexiga" ("...because of my bladder problem"). Note that as in Portuguese the use of personal pronouns is not mandatory, in the translated versions, the pronouns were not always translated.

In the pretesting phase, the v.PINQ-br was applied to 44 children diagnosed with LUTS by Dysfunctional Voiding Symptom Score (DVSS) screening, 23 boys and 21 girls (mean age: 9.73 and 9.68 years respectively) and to their family as well. Afterward, they were all interviewed to assess the difficulties encountered in completing it and identify if there were questions or words that were difficult to understand.

After pretesting, some questions were adapted to the language commonly used by Brazilian children, but the changes didn't change the real meaning of the questions. The expression "bladder problem" previously translated to "problema de bexiga" was modified to "problema de xixi" (xixi means pee), because it was more understandable by the children and their family. The expression "minha família" (means my family) was also adopted in place of the expression "mum and dad" to include the other family members with who the child lives or other close family members who take care of the child.

The internal consistency was considered satisfactory, confirmed by Cronbach's alpha coefficient of 0.74 for the test with children and 0.86 for the test with parents.

The cultural, linguistic, and semantic adaptations obtained from v.PINQ1 can be seen in Appendix A1. The PINQ-br can be seen in Appendix A2.

(Appendix A.1 and Appendix A.2)

## **Discussion**

This study presents the first version in Portuguese, adapted to the Brazilian context of the PINQ, a specific instrument to assess the impact of incontinence on children's quality of life.

The process of translation and cross-cultural adaptation was based on the guideline proposed by Beaton, et al. (21), a methodology that has already been used successfully in Brazil to translate and validate different instruments, such as: Pittsburgh Sleep Quality Index (23); Developmental Coordination Disorder Questionnaire (24); Dysfunctional Voiding Score Symptom (DVSS) Questionnaire (16); Amsterdam infant stool scale (25), and; perceived risk of HIV (26).

In the present study, no obstacles were found that could turn out the instrument unviable. The translation and adaptation process was fast and easy, since the original instrument has a simple structure, direct questions and suitable language for children. Only one presential meeting of the expert committee was necessary to reach the agreement in the discussion of the translation and cultural adaptations of the vPINQ3. The main concern of the committee was to maintain the essence of the original instrument.

The structure of the original self-applied and proxy questionnaire with the number of questions and scoring system was considered with perfect fitting in the Brazilian Portuguese and local culture, with no need of adjustments as in the German version (20). It is also worth mentioning that the Brazilian culture is more informal and the social structure, mainly in the lower social class, the extended family unit is still frequent. Therefore the adjustments of “problema de xixi” e “minha família” seemed to be adequate.



The PINQ-br showed satisfactory internal consistency in both self-applicable and proxy versions, as seen in the original instrument (17–19) and German version ( $\alpha$  de Cronbach foi de 0,86)(20). The authors believe that it will bring value to research and clinical approaches. The main limitation of this study was the lack of testing reproducibility; therefore further studies should be carried out to assess the intra- and inter-rater reliability of the PINQ-br.

### **Conclusion**

PINQ was successfully translated into Brazilian Portuguese and culturally adapted to assess health-related quality of life in Brazilian children and adolescents with incontinence urinary.

### **Conflict of interest**

Nil.

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None.

### **Acknowledgments**

We are very grateful to all the children and parents who participated in this study.

## References

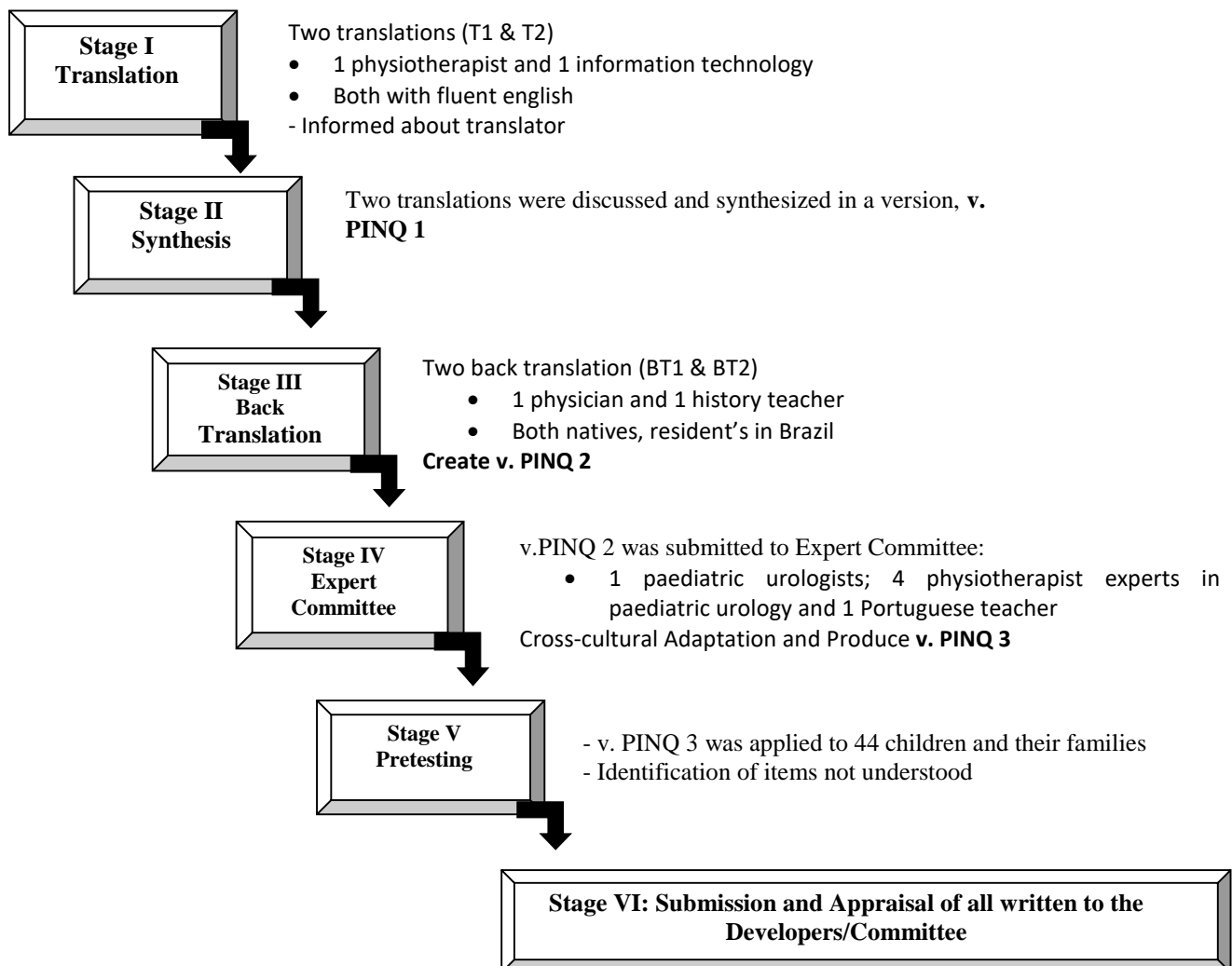
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Figure 1 – Graphic representation of the stages of cross-cultural adaptation recommended.



Appendix A.1 – Adaptations of the Pediatric Incontinence Questionnaire (PINQ) in the Translation and transcultural adaptation to Brazilian Portuguese process

Questão	v.PINQ 1	v.PINQ 3	v.PINQ-br
1	Eu me sinto tímido por causa do meu problema de bexiga	Eu fico tímido por causa do meu problema de bexiga	Eu fico envergonhado por causa do meu problema de bexiga
2	As pessoas da minha família me tratam diferente por causa do problema de bexiga	As pessoas da minha família me tratam diferente por causa do meu problema de bexiga	Minha família me trata diferente por causa do meu problema de xixi
2	Fico preocupado das pessoas pensarem que minhas roupas cheiram xixi	Fico preocupado das pessoas pensarem que minhas roupas cheiram xixi	Fico preocupado das pessoas sentirem cheiro de xixi nas minhas roupas
4	Penso que meu problema de bexiga não vai melhorar.	Eu acho que meu problema de bexiga não vai melhorar.	Eu acho que meu problema de xixi não vai melhorar.
5	Meu pai e minha mãe se preocupam comigo por causa do problema de bexiga	Meus pais se preocupam comigo por causa do meu problema de bexiga	Minha família se preocupa comigo por causa do meu problema de xixi
6	Me sentiria melhor se não tivesse o problema de bexiga	Eu me sentiria melhor se não tivesse o problema de bexiga	Eu me sentiria melhor se não tivesse o problema de xixi
7	O problema de bexiga me deixa nervoso	Meu problema de bexiga me deixa nervoso	Meu problema de xixi me deixa nervoso
8	Meu pai e minha mãe às vezes ficam irritados por causa do problema de bexiga	Meus pais às vezes ficam irritados por causa do meu problema de bexiga	Minha família às vezes fica irritada por causa do meu problema de xixi
9	O problema de bexiga me impede de dormir fora de casa em festa de pijama ou feriado	Meu problema de bexiga me impede de dormir fora nos finais de semana	Meu problema de xixi me impede de dormir fora de casa
10	O problema de bexiga faz sentir-me chateado	Meu problema de bexiga me faz sentir chateado comigo mesmo	Meu problema de xixi me deixa chateado comigo mesmo
11	Acordo durante o sono por causa do problema de bexiga	Eu acordo por causa do meu problema de bexiga	Eu acordo por causa do meu problema de xixi
12	Sinto falta de fazer algumas coisas por causa do meu problema de bexiga	Eu sinto falta de fazer algumas coisas por causa do meu problema de bexiga	Eu sinto falta de fazer algumas coisas por causa do meu problema de xixi
13	Sinto-me triste por causa do meu problema de bexiga	Eu fico infeliz por causa do meu problema de bexiga	Eu fico chateado por causa do meu problema de xixi
14	Meu problema de bexiga me faz sentir triste	Meu problema de bexiga me deixa triste	Meu problema de xixi me deixa triste
15	Penso sobre meu problema de bexiga quando escolho qual esporte praticar	Eu penso no meu problema de bexiga quando escolho qual esporte praticar	Eu penso no meu problema de xixi quando vou praticar algum esporte ou brincar
16	Eu tenho que ir ao banheiro quando estou assistindo a um filme	Quando estou assistindo filme eu tenho que ir ao banheiro	Quando estou assistindo filme eu tenho que parar para ir ao banheiro
17	Se meu problema de bexiga fosse corrigido resolvido eu convidaria meus amigos para minha casa	Se meu problema de bexiga fosse resolvido, eu convidaria mais amigos para minha casa	Se meu problema de xixi fosse resolvido, eu convidaria meus amigos para ir em casa mais vezes

18	Escolho passatempos que não serão estragados parando para ir ao banheiro	Escolho atividades que não serão atrapalhadas se eu for ao banheiro	Prefiro brincadeiras que não preciso parar para ir ao banheiro
19	Meu problema de bexiga me faz sentir diferente das outras pessoas	Meu problema de bexiga me faz sentir diferente das outras pessoas	Meu problema de xixi me faz sentir diferente das outras crianças
20	Sinto falta de estar com amigos por causa do problema da bexiga	Eu sinto falta de estar com meus amigos por causa do problema de bexiga	Eu sinto falta de ver com meus amigos por causa do problema de xixi

Appendix A.2 – Brazilian Version of the Pediatric Incontinence Questionnaire (PINQ-br)

**QUESTIONÁRIO DE IMPACTO DAS DISFUNÇÕES DO TRATO URINÁRIO INFERIOR NA QUALIDADE DE VIDA RELACIONADA À SAÚDE EM CRIANÇAS - PINQ-br**

Nome da criança: \_\_\_\_\_

Sexo: ( ) Feminino ( ) Masculino Data Nascimento: \_\_\_\_/\_\_\_\_/\_\_\_\_

Data da avaliação: \_\_\_\_/\_\_\_\_/\_\_\_\_ Escore Total: \_\_\_\_\_

	Não	Quase nunca	Às vezes	Quase sempre	Sempre
1. Eu fico envergonhado por causa do meu problema de xixi	0	1	2	3	4
2. As pessoas da minha família me tratam diferente por causa do meu problema de bexiga	0	1	2	3	4
3. Fico preocupado das pessoas pensarem que minhas roupas cheiram xixi	0	1	2	3	4
4. Eu acho que meu problema de bexiga não vai melhorar	0	1	2	3	4
5. Meus pais se preocupam comigo por causa do meu problema de bexiga	0	1	2	3	4
6. Eu me sentiria melhor se não tivesse o problema de bexiga	0	1	2	3	4
7. Meu problema de bexiga me deixa nervoso	0	1	2	3	4
8. Meus pais às vezes ficam irritados por causa do meu problema de bexiga	0	1	2	3	4
9. Meu problema de bexiga me impede de dormir fora nos finais de semana	0	1	2	3	4
10. Meu problema de bexiga me faz sentir chateado comigo mesmo	0	1	2	3	4
11. Eu acordo por causa do meu problema de bexiga	0	1	2	3	4
12. Eu sinto falta de fazer algumas coisas por causa do meu problema de bexiga	0	1	2	3	4
13. Eu fico infeliz por causa do meu problema de bexiga	0	1	2	3	4
14. Meu problema de bexiga me deixa triste	0	1	2	3	4
15. Eu penso no meu problema de bexiga antes de escolher qual esporte praticar	0	1	2	3	4
16. Quando estou assistindo filme eu tenho que parar para ir ao banheiro	0	1	2	3	4
17. Se meu problema de bexiga fosse resolvido eu convidaria mais amigos para minha casa	0	1	2	3	4
18. Escolho atividades que não posso interromper para ir for ao banheiro	0	1	2	3	4
19. Meu problema de bexiga me faz sentir diferente das outras pessoas	0	1	2	3	4



20. Eu sinto falta de estar com meus amigos por causa do problema de bexiga	0	1	2	3	4
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### 3. ANÁLISE CRÍTICA DOS ARTIGOS

#### ***Artigo 1 - Clinical phenotyping of children with nocturnal enuresis: A critical review-based proposal***

O primeiro artigo desta tese é um protocolo para revisão analítica e metodológica da literatura, submetido para publicação no periódico **Physical Therapy Review**. O estudo seguiu as recomendações do Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P)(42) e foi registrada no International Prospective Register of Systematic Reviews (PROSPERO) (CRD42021276687).

A publicação do protocolo teve como meta registrar a metodologia estruturada para a revisão que teve como objetivo responder a pergunta: Quais são as manifestações clínicas associadas à enurese noturna? O intuito foi levantar publicações recentes que nos permitissem reconhecer e analisar de forma ampla as manifestações clínicas, fisiológicas e funcionais mais relevantes associadas à EN. A partir daí os pesquisadores buscaram identificar semelhanças entre as manifestações para encontrar um critério para agrupá-las em domínios (Tabela 1). A categorização foi avaliada e validada por um comitê de especialistas posteriormente.

Tabela 1 - Principais manifestações clínicas relacionadas à EN, categorizadas em domínios

<b>Domínios</b>	<b>Principais manifestações relacionadas à EN</b>
<b>Urological</b>	Diurnal incontinence
	Urinary urgency/ Urge incontinence
	Recurrent urinary tract infection
	Nocturia
	Urine loss after urination

	Feeling of incomplete bladder emptying
	Polyuria
<b>Gastrointestinal</b>	Constipation
	Fecal incontinence
<b>Respiratory</b>	Asthma
	Allergic rhinitis
	Obstructive sleep apnea
	Adenotonsillar hypertrophy
<b>Neural</b>	Central nervous system maturation deficit
	Inhibitory signal deficiency
	Microstructural changes in the areas: brain stem, primary motor cortex, prefrontal cortex, insula, anterior cingulate cortex, thalamus
	Reduced motor threshold: active and resting
<b>Sleep</b>	Sleep fragmentation
	Fast limb movements
	Snores
	Parasomnias
	Obstructive sleep apnea
<b>Cardiovascular, hormonal, renal and metabolic</b>	Blood pressure elevation
	Circadian rhythm change
	arterial vasodilation
	natriuresis
	↓ decreased vasopressin excretion
	Obesity
<b>Genetic</b>	High % heredity
<b>Psychomotor</b>	Fine and global motor deficit
	Posture deficit
	Balance deficit

↓ Spatial perception

Dysarthria

Low motor performance

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**Psychiatric and Psychological**

Attention deficit hyperactivity disorder (ADHD)

Oppositional defiant disorder (ODD)

Anxiety

Depression

↓ School performance

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**Socioemotional**

Low self-esteem

Social exclusion

Insecurity

Learning deficit\*

Relationship difficulties\*

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***Artigo 2 - Clinical phenotyping of children with nocturnal enuresis: a key classification to approach improvement***

O artigo 2, original desta tese foi submetido para publicação no periódico **Journal Pediatric Urology**, indexado ao MEDLINE e Web os Science. Trata-se de um estudo que desenvolveu o Modelo de Fenotipagem clínica de crianças com enurese noturna, baseado na revisão analítica e metodológica (descrita no artigo 1), complementada por uma análise bibliométrica da literatura realizada no VOSviewer (version 1.6.18).

Modelos de fenotipagem tem o objetivo de possibilitar a compreensão dos mecanismos da doença, predição da resposta à terapia e o risco de eventos adversos. Têm sido propostos para diversas patologias, tais como: asma(82–84), doença pulmonar obstrutiva crônica (DPOC) (85), cistite intersticial, prostatite e síndrome da dor vesical(86,87),(82) apnéia obstrutiva do sono(88), síndrome da dor pélvica crônica, osteoartrite(89), doença renal crônica(90), doença de Parkinson(91) dentre outras.

Diante do fato de que a enurese noturna é uma condição heterogênea que envolve diversas fatores, consideramos importante organizar os dados da literatura em um modelo de fenotipagem, para elucidar sua complexidade e facilitar a construção do diagnóstico clínico e direcionamento da abordagem terapêutica. No nosso entendimento esse material traz importante contribuição clínica para a área, pois norteia os profissionais envolvidos o que terá impacto direto nas crianças com enurese.

Um grande desafio foi a elaboração da representação gráfica para o modelo de fenotipagem que ocorreu após o levantamento de todos os dados da literatura, o agrupamento das manifestações, a categorização em domínios e a

validação pelo comitê de especialistas. Foram desenvolvidos alguns modelos gráficos com apoio de um designer, revisados e corrigidos após discussão do grupo, até que obtivemos o modelo que consideramos claro e inteligível para todos os profissionais que atuam nesta área e que pode ser apreciado no artigo na íntegra.

***Artigo 3 - Pediatric Incontinence Questionnaire (PINQ): Translation and transcultural adaptation to Brazilian Portuguese***

O artigo 3 desta tese, é um estudo de tradução e adaptação transcultural de um questionário de qualidade de vida relacionada à saúde (QVRS) para crianças com disfunções urinárias, submetido e **aceito** para publicação no **Jornal de Pediatria**, indexado nas principais bases de dados.

Sabe-se que as disfunções urinárias têm importante impacto psicossocial, com manifestações de baixa autoestima, insegurança, baixo desempenho escolar e exclusão social, fatores que comprometem consideravelmente o desenvolvimento geral e a qualidade de vida relacionada à saúde (QVRS) de crianças, adolescentes e suas famílias (13,14). A International Children's Continence Society (ICCS) recomenda avaliar o impacto dessas disfunções QVRS de crianças e adolescentes, porém no Brasil não existia um instrumento em português brasileiro específico para este fim.

Após usarmos a versão original em nosso ambulatório de uropediatria, decidimos traduzir e adaptar a ferramenta para utilização em nosso país e iniciamos o processo seguindo as recomendações para este tipo de validação. Toda a metodologia está descrita no artigo na íntegra. O questionário original foi desenvolvido pela fisioterapeuta Wendy Bower, que foi favorável à elaboração da versão em português brasileiro e é uma das co-autoras deste artigo.

#### 4. APRESENTAÇÃO DA PLATAFORMA EDUCACIONAL

Xixi e Cocô sem crise é uma plataforma educacional digital (Omnichannel) onde cada criança se sente representada e especial. Foi desenvolvida com muito amor e tem o propósito de impactar positivamente a vida de crianças, familiares, professores, profissionais de saúde e cuidadores de crianças em geral por meio da educação e informação direta em linguagem acessível sobre: a função normal dos sistemas urinário e intestinal, os desafios do processo de desfralde, as possíveis disfunções urinárias e intestinais que ocorrem na infância e a orientação para busca de ajuda profissional.

Idealizado por Rita Pavione Rodrigues Pereira, juntamente com sua mentora Professora Dra. Clarice Tanaka, que estudam o assunto há mais de 12 anos e se dedicam ao cuidado das crianças e adolescentes com disfunções urinárias e intestinais.

A plataforma Xixi e Cocô sem crise está disponível no idioma português nas plataformas: Youtube, Facebook e Instagram (FIGURA 1); pode ser encontrado pela extensão @xixiecocosemcrise e tem o lema 'Se você cuida de uma criança, não deixe de acompanhar'.

A produção dos conteúdos não envolve tecnologias avançadas, mas conta com diversas etapas, tais como: a definição de temas e datas para publicação, desenvolvimento de roteiros e textos, ensaios, revisão, gravação em estúdio, edição dos vídeos, desenvolvimento das peças visuais e publicação. Todo o processo conta com o apoio de experts em imagem e vídeo, web designer e marketing.



O conteúdo produzido é legítimo e desenvolvido exclusivamente para a plataforma, baseado em referências científicas, 'guidelines' mundiais e experiência clínica acumulada do idealizador. O principal diferencial é a linguagem simples, clara e lúdica, o que o torna acessível a públicos de diferentes idades e níveis de instrução, podendo ser consumido na forma de vídeo ou leitura. Conta com os carismáticos personagens, Anna e Vinny, duas crianças espertas e divertidas (fantoques) e a doce Dra Mia.

Se você achou interessante, precisa conhecer e se inscrever no nosso canal, links para acesso:

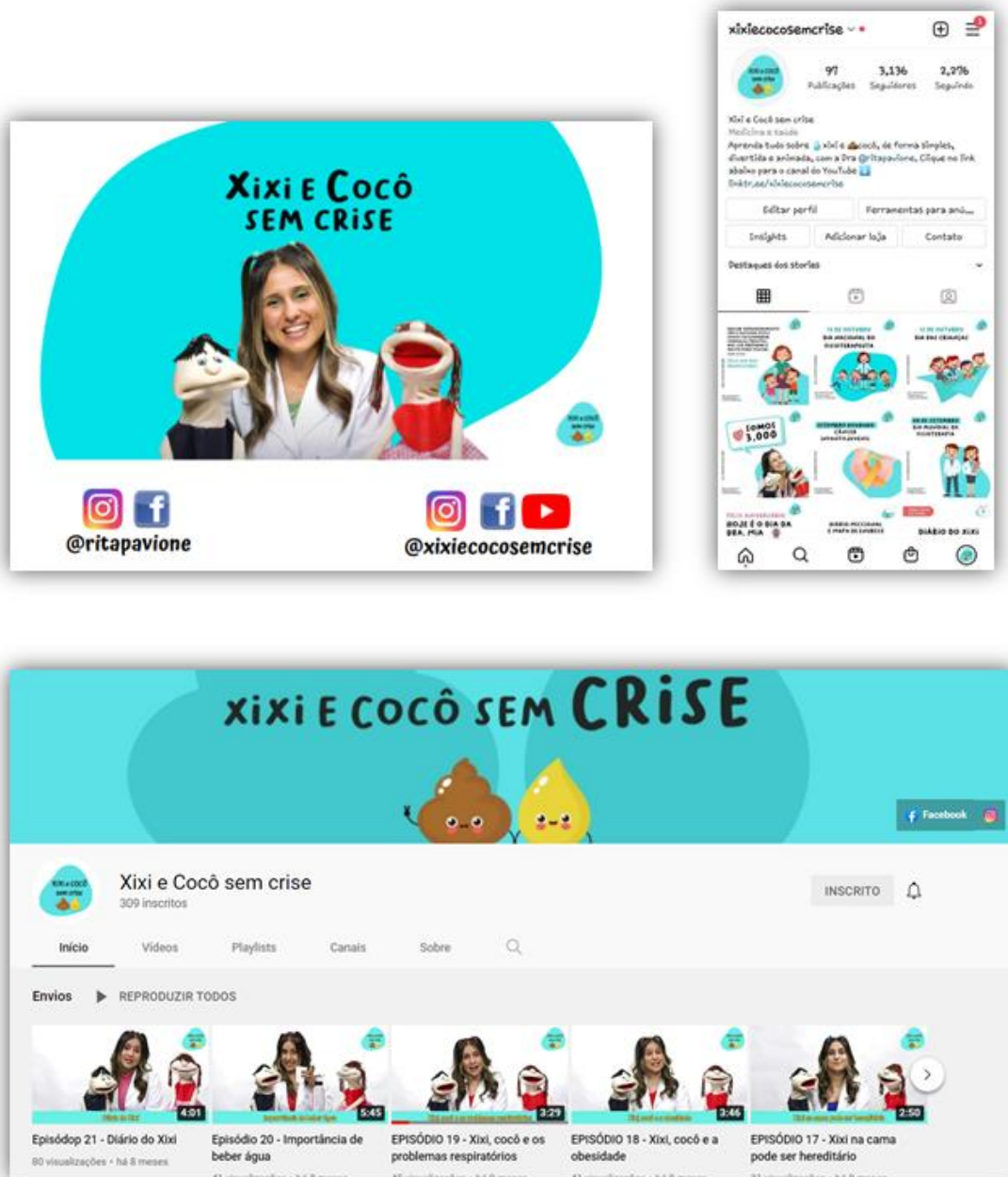
**Instagram:** <https://instagram.com/xixiecocosemcrise?igshid=11jxlv6dl3m6>

**Facebook:** [https://m.facebook.com/Xixi\\_e\\_coc%C3%B4-sem-crise-104218068329361/](https://m.facebook.com/Xixi_e_coc%C3%B4-sem-crise-104218068329361/)

**Youtube:** <https://www.youtube.com/c/XixieCocôsemcrise>

Acreditamos que esta iniciativa agrega imensurável um valor à população.

Figura 1 – Fotos ilustrativas de divulgação do Canal Xixi e Cocô sem crise



## **6. CONCLUSÕES**

Este estudo possibilitou o desenvolvimento de um modelo de fenotipagem para crianças com EN baseado em evidências que trarão importantes contribuições para o campo clínico e estudos futuros. Além disso, possibilitou a construção de uma plataforma educacional digital (Omnichannel) sobre função e disfunção urinária e intestinal, destinada a crianças e suas famílias.

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## 8. ANEXOS

### ANEXO 1 – Termo de consentimento livre e esclarecido - TCLE

#### HOSPITAL DAS CLÍNICAS DA FACULDADE DE MEDICINA DA UNIVERSIDADE DE SÃO PAULO-HCFMUSP

#### TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO PARA CRIANÇAS E ADOLESCENTES COM ENURESE

#### DADOS DE IDENTIFICAÇÃO DO SUJEITO DA PESQUISA OU RESPONSÁVEL LEGAL

1. NOME: \_\_\_\_\_

DOCUMENTO DE IDENTIDADE Nº : \_\_\_\_\_ SEXO : .M  F

DATA NASCIMENTO: \_\_/\_\_/\_\_

ENDEREÇO: \_\_\_\_\_ Nº \_\_\_\_\_ APTO: \_\_\_\_\_

BAIRRO: \_\_\_\_\_ CIDADE \_\_\_\_\_

CEP: \_\_\_\_\_ TELEFONE: ( ) \_\_\_\_\_

2. RESPONSÁVEL LEGAL: \_\_\_\_\_

NATUREZA (grau de parentesco, tutor, curador etc.): \_\_ - \_\_\_\_\_

DOCUMENTO DE IDENTIDADE....SEXO: M  F

DATA NASCIMENTO.: \_\_/\_\_/\_\_

ENDEREÇO: \_\_\_\_\_ Nº \_\_\_\_\_ APTO: \_\_\_\_\_

BAIRRO: \_\_\_\_\_ CIDADE \_\_\_\_\_

CEP: \_\_\_\_\_ TELEFONE: ( ) \_\_\_\_\_

#### DADOS SOBRE A PESQUISA

1. TÍTULO DO PROTOCOLO DE PESQUISA: ***Estimulação sensorial e neuromotora em crianças e adolescentes com enurese noturna***

2. PESQUISADOR : Dra. Clarice Tanaka

CARGO/FUNÇÃO: Fisioterapeuta INSCRIÇÃO CONSELHO REGIONAL Nº 3/342 – F

UNIDADE DO HCFMUSP: ICHC – FMUSP

3. AVALIAÇÃO DO RISCO DA PESQUISA:

RISCO MÍNIMO

RISCO MÉDIO

RISCO BAIXO

RISCO MAIOR

4. DURAÇÃO DA PESQUISA : 2 anos

## HOSPITAL DAS CLÍNICAS DA FACULDADE DE MEDICINA DA UNIVERSIDADE DE SÃO PAULO-HCFMUSP

1 – O seu filho está sendo convidado a participar voluntariamente do estudo: **Estimulação sensorial e neuromotora em crianças e adolescentes com enurese noturna**. Este estudo visa avaliar as habilidades motoras e os sintomas urinários do seu filho e propor um tratamento de fisioterapia que melhore o equilíbrio, a postura, a coordenação e os sintomas urinários.

2 – A primeira parte do estudo é composta pela avaliação geral do seu filho através de consulta com equipe multiprofissional (médico, psicólogo e fisioterapeuta), que farão uma entrevista sobre o histórico de vida, sintomas urinários, qualidade de vida, aprendizado e irão solicitar a realização de exame de sangue simples, urofluxometria (que é uma exame para análise de como seu filho urina, não é invasivo, ele só precisa fazer xixi sentado em uma cadeira que parece um vaso sanitário, para podermos calcular o tempo que ele demora para fazer, a quantidade de xixi que ele elimina e como é o fluxo de urina), e um exame de ultrassom abdominal com bexiga cheia e logo após esvaziar.

Além dos exames, os profissionais irão fazer alguns questionamentos padronizados (questionários) para avaliar a qualidade de vida do seu filho, o comportamento e o nível de inteligência.

O fisioterapeuta irá avaliar a postura e para isso serão colocadas diversas bolinhas de isopor em algumas regiões do corpo dele, onde tem ossos bem visíveis e será tirada uma foto para analisarmos sua postura através do computador, que terá como referência essas bolinhas. Neste caso será necessário que o senhor ou a senhora assine um termo de autorização de imagem, que garante que esta fotografia será utilizada pelos pesquisadores apenas para fins deste estudo.

Na sequência, será avaliado o equilíbrio do seu filho através de uma plataforma de força, que é uma placa de cerâmica fixada ao chão e conectada a um computador que analisa o jeito de pisar do seu filho e o seu equilíbrio. Ele ficará em pé e descalço sobre a plataforma, com os braços relaxados ao longo do corpo. O primeiro teste serve para avaliar o equilíbrio parado em um piso firme. Ele ficará em pé por 60 segundos sobre a plataforma, com os olhos abertos e depois fechados. Em seguida será colocado um colchonete de ginástica sobre a plataforma onde ele ficará em pé por 60 segundos, com olhos abertos e fechados. O colchonete irá avaliar se o equilíbrio do seu filho mudará quando o piso não for mais reto.

O fisioterapeuta irá realizar alguns testes para verificar o desenvolvimento do seu filho. Os testes são simples e lembram atividades da educação física da escola como: encaixe de formas geométricas, andar em linha reta, arremessar um alvo, lançar uma bola, escrever palavras e frases dentre outros.

Após a avaliação seu filho será incluído em um dos grupos de tratamento, conforme indicação:

- **Grupo 1:** Exercícios lúdicos de coordenação motora, postura, equilíbrio e atividades do dia a dia supervisionadas.

- **Grupo 2:** Treinamento de músculos do períneo para melhorar controle urinário, com auxílio de um equipamento chamado biofeedback.
- **Grupo 3:** Estimulação elétrica não dolorosa, na região das costas próximo ao osso do quadril.(região sacral).

3 – Não será necessário trazer exames laboratoriais, como RX, sangue, etc.;

4 – A avaliação e intervenção não trarão desconfortos para seu filho, o único desconforto será um pequeno desequilíbrio nos testes de equilíbrio, e a estimulação elétrica transcutânea que pode dar a sensação de formigamento na pele, porém haverá fisioterapeutas ao redor, para maior segurança.

5 – O principal benefício obtido na realização deste estudo é o de trazer novas perspectivas na abordagem e tratamento das crianças com enurese noturna, oferecendo uma reabilitação mais global e funcional.

6 – Não existem procedimentos alternativos, somente o que já foi descrito.

7 – Em qualquer etapa do estudo, você terá acesso aos profissionais responsáveis pela pesquisa para esclarecimento de eventuais dúvidas. O principal investigador é a Dra. Clarice Tanaka que pode ser encontrado no Serviço de Fisioterapia do ICHC ou pelo Telefone: 2661-6867, FAX: 2661-7969. Se você tiver alguma consideração ou dúvida sobre a ética da pesquisa, entre em contato com o Comitê de Ética em Pesquisa (CEP) – Rua Ovídio Pires de Campos, 225 – 5º andar – tel: (11) 2661-7585, (11) 2661-1548, (11) 2661-1549; e-mail: [cappesq.adm@hc.fm.usp.br](mailto:cappesq.adm@hc.fm.usp.br)

8 – Você terá o direito de retirar seu filho do estudo a qualquer momento, sem qualquer prejuízo à continuidade do tratamento na Instituição;

09 – As informações obtidas serão analisadas em conjunto com outros pacientes, não será divulgada a identificação de nenhum paciente;

10 – Você terá o direito de ser mantido atualizado sobre os resultados parciais das pesquisas, quando em estudos abertos, ou de resultados que sejam do conhecimento dos pesquisadores;

11 – Não há despesas pessoais para o seu filho em qualquer fase do estudo, incluindo exames e consultas. Também não há compensação financeira relacionada à participação de seu filho. Se existir qualquer despesa adicional, ela será absorvida pelo orçamento da pesquisa.

12 - O pesquisador se compromete a utilizar os dados e o material coletado somente para esta pesquisa.

Acredito ter sido suficientemente informado a respeito das informações que li ou que foram lidas para mim, descrevendo o estudo: **Estimulação sensorial e neuromotora em crianças e adolescentes com enurese noturna.**

Eu discuti \_\_\_\_\_ sobre a minha decisão em permitir que meu filho participe neste estudo. Ficaram claros para mim quais são os propósitos do estudo, os procedimentos a serem realizados, seus desconfortos e riscos, as garantias de confidencialidade e de esclarecimentos permanentes. Ficou claro também que a participação do meu filho é isenta de despesas e que tenho garantia do acesso a tratamento

hospitalar quando necessário. Concordo voluntariamente com a participação do meu filho neste estudo e poderei retirar o meu consentimento a qualquer momento, antes ou durante o mesmo, sem penalidades ou prejuízo ou perda de qualquer benefício que eu possa ter adquirido, ou no meu atendimento neste Serviço.

\_\_\_\_\_ Data \_\_\_\_/\_\_\_\_/\_\_\_\_\_  
Assinatura do paciente/representante legal

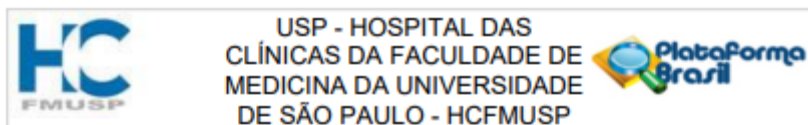
\_\_\_\_\_ Data \_\_\_\_/\_\_\_\_/\_\_\_\_\_  
Assinatura da testemunha (para casos de pacientes menores de 18 anos, analfabetos, semi-analfabetos ou portadores de deficiência auditiva ou visual.)

*(Somente para o responsável do projeto)*

Declaro que obtive de forma apropriada e voluntária o Consentimento Livre e Esclarecido deste paciente ou representante legal para a participação neste estudo.

\_\_\_\_\_ Data \_\_\_\_/\_\_\_\_/\_\_\_\_\_  
Assinatura do responsável pelo projeto

## ANEXO 2 – Aprovação CAPpesq



**PARECER CONSUBSTANCIADO DO CEP**

**DADOS DA EMENDA**

**Título da Pesquisa:** Estimulação sensorial e neuromotora no tratamento de crianças e adolescentes com enurese noturna: ensaio clínico randomizado

**Pesquisador:** Clarice Tanaka

**Área Temática:**

**Versão:** 3

**CAAE:** 70682317.5.0000.0068

**Instituição Proponente:** Hospital das Clínicas da Faculdade de Medicina da USP

**Patrocinador Principal:** Financiamento Próprio

**DADOS DO PARECER**

**Número do Parecer:** 3.555.725

**Apresentação do Projeto:**

Projeto de pesquisa possui aprovação anterior onde foram solicitadas alterações no projeto, especificamente no objetivo e no método, em decorrência da qualificação de doutorado da pesquisadora executante.

**Objetivo da Pesquisa:**

- Analisar o efeito de um programa de uroterapia padrão nos sintomas urinários de crianças com enurese noturna e em um segundo momento,- Analisar o efeito de um programa de exercícios funcionais associados à estimulação transcraniana por corrente contínua (ETCC) nos sintomas urinários, desempenho motor e comportamento de crianças com enurese noturna.

**Avaliação dos Riscos e Benefícios:**

Risco baixo com descrição adequada das possíveis sensações causadas pela estimulação transcraniana (sensação de formigamento, coceira e sensação de queimação na hora da aplicação que desaparece rapidamente). Benefícios:oferecer novas opções de tratamento para as crianças com enurese noturna, estimulando seu desenvolvimento em todos os aspectos de forma funcional.

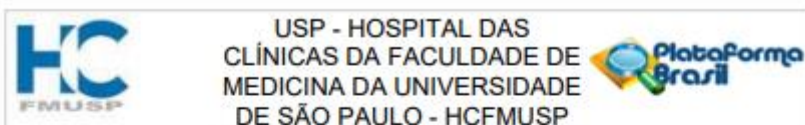
**Comentários e Considerações sobre a Pesquisa:**

Estudo com relevância clínica para o tratamento de crianças com enurese noturna.

Os pesquisadores solicitam mudança nos objetivos e principalmente no método do projeto de

**Endereço:** Rua Ovídio Pires de Campos, 225 5º andar  
**Bairro:** Cerqueira Cesar **CEP:** 05.403-010  
**UF:** SP **Município:** SAO PAULO  
**Telefone:** (11)2661-7585 **Fax:** (11)2661-7585 **E-mail:** cappelq.adm@hc.fm.usp.br





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pesquisa acrescentando a estimulação transcraniana por corrente contínua no tratamento da enurese noturna.

Propõem também mudança nos critérios de inclusão em relação à faixa etária e modificaram o tratamento fisioterapêutico acrescentando algumas vivências práticas.

**Considerações sobre os Termos de apresentação obrigatória:**

TCLE ajustado adequadamente conforme solicitações em parecer anterior.

**Recomendações:**

Sem recomendações.

**Conclusões ou Pendências e Lista de Inadequações:**

Sem pendências.

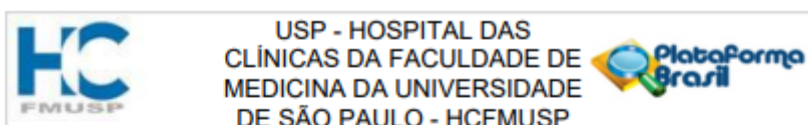
**Considerações Finais a critério do CEP:**

Em conformidade com a Resolução CNS nº 466/12 – cabe ao pesquisador: a) desenvolver o projeto conforme delineado; b) elaborar e apresentar relatórios parciais e final; c) apresentar dados solicitados pelo CEP, a qualquer momento; d) manter em arquivo sob sua guarda, por 5 anos da pesquisa, contendo fichas individuais e todos os demais documentos recomendados pelo CEP; e) encaminhar os resultados para publicação, com os devidos créditos aos pesquisadores associados e ao pessoal técnico participante do projeto; f) justificar perante ao CEP interrupção do projeto ou a não publicação dos resultados.

**Este parecer foi elaborado baseado nos documentos abaixo relacionados:**

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_1289921_E1.pdf	19/07/2019 08:33:33		Aceito
Outros	Carta_resposta_ao_parecer_19_07_19.pdf	19/07/2019 08:32:47	Clarice Tanaka	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE_13_05_19.pdf	13/05/2019 08:12:43	Clarice Tanaka	Aceito
Brochura Pesquisa	Doutorado_Rita_30_04_19_VERSAO2.pdf	30/04/2019 08:58:37	Clarice Tanaka	Aceito
Projeto Detalhado / Brochura	Doutorado_Rita_30_04_19_VERSAO2_BROCHURA.pdf	30/04/2019 08:53:54	Clarice Tanaka	Aceito

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Investigador	Doutorado_Rita_30_04_19_VERSAO2_BROCHURA.pdf	30/04/2019 08:53:54	Clarice Tanaka	Aceito
Outros	Formulario_emendas_19_04_19.pdf	22/04/2019 18:21:08	Clarice Tanaka	Aceito
Outros	Solicitacao_Adendo_22_04_19.pdf	22/04/2019 18:00:53	Clarice Tanaka	Aceito
Outros	CadastroOnline_ProjetoRita_04_07_2017.pdf	04/07/2017 12:39:57	Clarice Tanaka	Aceito
Folha de Rosto	Folha_de_rosto.pdf	20/06/2017 13:43:01	Clarice Tanaka	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	Carta_de_anuencia2.pdf	24/05/2017 12:11:59	Clarice Tanaka	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	Carta_de_anuencia1.pdf	24/05/2017 12:11:47	Clarice Tanaka	Aceito

**Situação do Parecer:**

Aprovado

**Necessita Apreciação da CONEP:**

Não

SAO PAULO, 05 de Setembro de 2019

Assinado por:  
ALFREDO JOSE MANSUR  
(Coordenador(a))

Endereço: Rua Ovídio Pires de Campos, 225 5º andar  
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