

Review Article

Knox Preschool Play Scale: a scoping review

Escala Lúdica Pré-Escolar de Knox: uma revisão de escopo

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Abstract

Introduction: Playing is intrinsically related to child development. Through play assessment, health professionals, including occupational therapists, can obtain information about child development. The Knox Preschool Play Scale - revised (KPPS-r) is a standardized instrument that enables the effective assessment of the skills existing in preschoolers' play behavior. **Objective:** To examine the national and international scientific production on the KPPS-r. **Method:** This is a scoping review of the literature utilizing the following research databases: Scopus, Lilacs, BDENF, Embase, Cochrane, Medline, PubMed, CINAHL, Web of Science, PsycINFO, Dedalus, BDTD, and PROQUEST; also Scielo, Google Scholar, and Capes Articles Website. The search strategy included the descriptors “Escala Lúdica Pré-escolar de Knox” OR “Knox Preschool Play Scale”. **Results:** 51 studies published between 1983 and 2019 involving 1816 children were identified. The associated use of over 36 assessment instruments was identified, enabling knowledge about the strengths and weaknesses of the scale. The KPPSr is a valuable and reliable instrument both in clinical practice and in research. However, the lack of a manual or guidelines for its application is a weakness of this instrument. **Conclusion:** This scoping review qualitatively analyzed the national and international literature addressing the KPPS, identifying gaps in scientific production and generating a broad panorama of data on the use, dissemination, and availability of this instrument, in addition to presenting an outline of the studies, their methodologies, and objectives.

Keywords: Child, Child Development, Play and Toys, Occupational Therapy.

Resumo

Introdução: O brincar é intrinsecamente relacionado ao desenvolvimento infantil. Através da avaliação do brincar, profissionais de saúde, incluindo terapeutas ocupacionais, podem obter informações sobre o desenvolvimento global da criança. A Escala Lúdica Pré-escolar de Knox – revisada (ELPKr) é um instrumento padronizado capaz de avaliar eficazmente as habilidades presentes no brincar de pré-escolares. **Objetivo:** Examinar a produção

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científica nacional e internacional sobre a utilização da ELPK. **Método:** Trata-se de uma revisão de escopo da literatura, utilizando as seguintes bases de dados para busca: Scopus, Lilacs, BDENF, Embase, Cochrane, Medline, PubMed, CINAHL, Web of Science, PsycINFO, Dedalus, BDTD, PROQUEST, além de Scielo, Google Scholar e Portal Capes de Periódicos. A estratégia de busca incluiu os descritores “Escala Lúdica Pré-escolar de Knox” OR “Knox Preschool Play Scale”. **Resultados:** Foram identificados 51 estudos publicados entre 1983 e 2019, envolvendo 1.816 crianças. Além disso, foi constatado uso associado de mais 36 instrumentos de avaliação, sendo possível indicar potencialidades e fragilidades da escala. A ELPK é um instrumento útil e confiável tanto na prática clínica como na pesquisa. No entanto, a não existência de um manual ou orientações sobre sua forma de aplicação foi indicada como uma fragilidade do instrumento. **Conclusão:** Esta revisão de escopo analisou qualitativamente a literatura nacional e estrangeira a respeito da ELPK, identificando lacunas nas produções científicas e gerando um amplo panorama de dados sobre a utilização, difusão e disponibilidade desse instrumento, além de apresentar um delineamento dos estudos, suas metodologias e objetivos.

Palavras-chave: Criança, Desenvolvimento Infantil, Jogos e Brinquedos, Terapia Ocupacional.

Introduction

Occupational therapy aims to favor individuals by helping them achieve health, well-being, and participation in their different life contexts through engagement in meaningful occupations (American Occupational Therapy Association, 2020). Playing is considered one of the main occupations in childhood and is intrinsically related to motor, emotional, cognitive, and social development (Sposito & Pfeifer, 2020; Pfeifer & Stagnitti, 2020), in addition to being a subjective activity that enables pleasure, curiosity, and spontaneity from a free choice of doing, without expecting any specific result (Sant’Anna, 2020; Ferland, 2006). In this way, in the occupational therapy clinic, playing can be used as a resource to achieve certain skills or establish as the very objective of the intervention (the performance of the playing occupation) (Sposito & Pfeifer, 2020). As playing is essential to child development, its assessment is appropriate to indicate the stage of development in which the child is and to point out possible lags (Sposito et al., 2012). The occupational therapy process encompasses assessment (occupational profile characterization and occupational performance analysis), therapeutic intervention, and intervention outcome (American Occupational Therapy Association, 2020). Occupational therapists use different resources to assess children's performance. However, the use of standardized assessments favors the comparison of results throughout the intervention, enabling a common language and understanding between different professionals, and facilitating their communication with the family (Richardson, 2010).

Among the standardized assessments of playful behavior in the occupational therapy literature, we highlight the Knox Preschool Play Scale, developed by occupational therapist Susan Knox in 1968 (Knox, 2002). Bledsoe & Shepherd (1982) and Harrison & Kielhofner (1986) examined the reliability and validity of this scale and proposed changes to make its items mutually exclusive. Based on the indications of these studies, Susan Knox proposed an updated version of the instrument, called Knox's Playful

Preschool Scale - revised (ELPKr), which provides an evolutionary description of typical playing, making it possible to assess the developmental stage of children from 0 to 6 years old (Knox, 2002).

ELPKr is divided into four dimensions: spatial domain, material domain, make-believe/symbolic play, and participation. The spatial domain concerns the control of body movements, acquired through exploration and experimentation, and is subdivided into gross motor coordination (movements that involve the use of larger muscles, for example: sitting, jumping, running) and interest (game choices). The exploration and use of objects are called the material domain and encompass manipulation, construction, goals, and attention. Manipulation presents aspects of fine motor skills, construction involves combining objects, the objective refers to the purpose of the game and attention presents the time spent in the same activity. The make-believe/symbolic game is the symbolic representation through which the child acquires an understanding of the social world. This domain includes dramatization, with the performance of new roles, and imitation, which involves the reproduction of the child's reality. Finally, participation characterizes the amount and type of social interactions, being subdivided into cooperation (way of interacting and collaborating with other participants in the game), humor (expressions and understanding of games), and language (verbal expressions with other participants) (Knox, 2002).

The ELPKr has been applied, since its creation, in different populations and countries, and it is considered important to carry out a literature review on how this instrument has been used, also investigating its usefulness and effectiveness to measure playful behavior in different clinical and/or social conditions. Thus, this study aims to examine the national and international scientific production related to the use of Knox's Playful Preschool Scale. Thus, it is expected to contribute to the clinical practice of evidence-based occupational therapy.

Methodology

A scoping review was carried out, a research method that aims to map the foundations and evidence of a given area of knowledge, examine the scoping of the object of study, summarize the findings and identify gaps in existing research (Arksey & O'Malley, 2005). The steps to carry out the work were: (1) defining the research question; (2) selecting the databases; (3) defining descriptors; (4) identifying relevant studies; (5) selecting studies; (6) mapping the data; (7) examine, discuss and report the data obtained (Arksey & O'Malley, 2005).

The following research question was used: How has the Knox Playful Preschool Scale been used in clinical and academic practice, highlighting its strengths and weaknesses?

Literature searches took place between October and November 2020 in the following databases: CAPES Journals, Scopus, Lilacs, BDENF, Embase, Cochrane, Medline, PubMed, CINAHL, Web of Science, PsycINFO, Scielo, Google Scholar, Dedalus, BDTD, and PROQUEST, and in studies available in the gray literature, using the following keywords: "Escala Lúdica Pré-escolar de Knox" OR "Knox Preschool Play Scale".

Search results were transferred to the Rayyan literature review software and evaluated according to their eligibility for inclusion in this study. We considered works in Portuguese, English, Spanish, French, German and Italian that used ELPKr as a tool to measure the development of preschool children. The exclusion criteria were just

mentioning or describing the Scale, without applying it; being written in a language other than those mentioned above; applying only one or a few items from the Scale.

The searches identified 424 studies, in which 208 duplicates were excluded, 156 publications after reading the title and abstract, and 27 after reading it in full, for not meeting the inclusion criteria. After this step, 18 studies from the authors' files were manually included, as shown in the following flowchart (Figure 1).

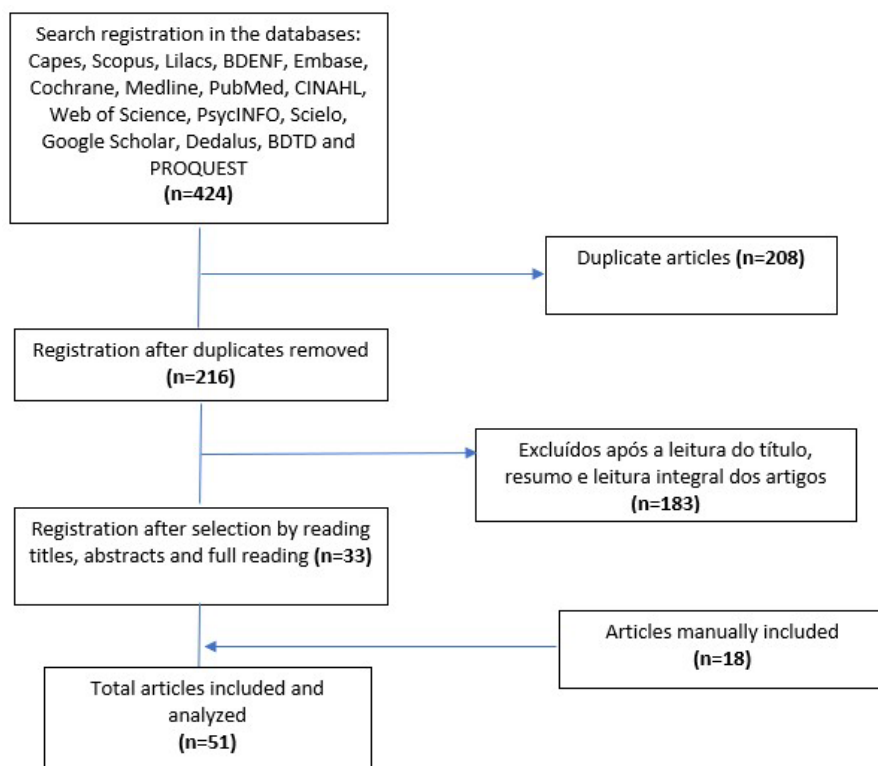


Figure 1. Flowchart of the sample screening and selection process.

Therefore, 51 studies were included in this review. The reading and analysis were performed by two independent researchers to map the results according to authors, year of publication, journals, books and theses, country of origin, participants' diagnosis, study objective, number, and age group of participants. Doubts and disagreements were resolved by consensus with a third researcher.

Results:

Of the 51 studies included in this review (Table 1), 38 were published as scientific articles, six as dissertations, three as abstracts in scientific event proceedings, two as course conclusion works, and two as theses. Most studies were developed by occupational therapists (98%) and published in occupational therapy journals (n=28).

The studies were conducted in the following countries: United States (n=17), Brazil (n=15), Germany (n=3), Australia (n=3), Canada (n=3), India (n=2), Colombia (n=2), Ireland (n=1), Israel (n=1), New Zealand (n=1), South Africa (n=1), Turkey (n=1) and Taiwan (n= 1), published in the following languages: English (n=36), Portuguese

(n=12), Spanish (n=2) and French (n=1) and developed between 1982 and 2019, as shown in Figure 2.

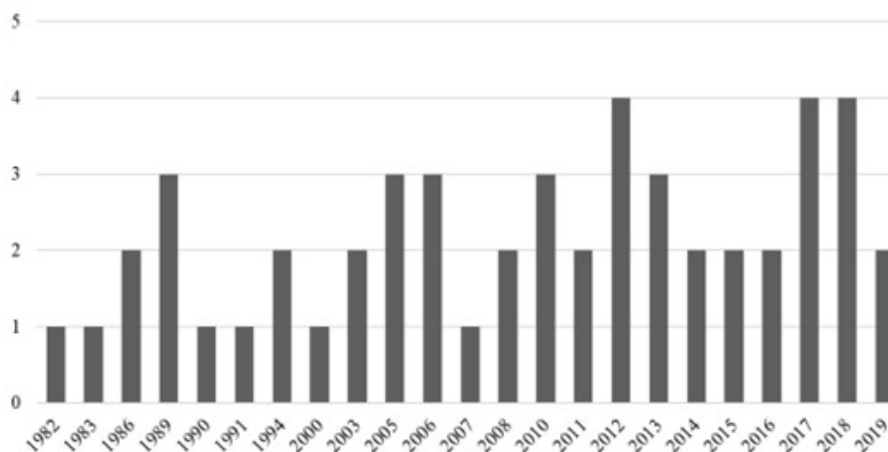


Figure 2. Annual distribution of the scientific production reviewed.

As for the characteristics of the population studied, there was a total of 1816 children, aged between 0 and 86 months. Most studies included typically developing children (n=28), followed by developmental delays (global developmental delay, language delay, social and cognitive skills delay) (n=13) and Autism Spectrum Disorder (n=10). However, the others involved a range of changes in bodily functions and structures or contextual factors: social vulnerability (low socioeconomic class, victims of physical abuse, social vulnerability, history of domestic violence, institutionalized – shelters and hospitals) (n=7); motor and sensory disorders (n=10); genetic syndromes (Down Syndrome and Tetra-Amelia) (n=7); neurological alterations (cerebral palsy and hydrocephalus) (n=5) and preterm infants (n=2).

The studies aimed to analyze and describe the playful behavior (23); compare patterns of playful behavior (11); verify the effectiveness of an intervention (6); verify the validity, agreement, internal consistency, reliability and translate, cross-culturally adapt the ELPK (8); compare therapeutic approaches (2); analyze and describe child development (1).

Regarding the type of research design, 20 cross-sectional observational analytical studies were registered; 12 descriptive studies; eight methodological studies of validation and/or cultural adaptation of the instrument; eight experimental analytical studies, and three observational cohort analytical studies. Information regarding the title, year of publication, authors, journal, country of origin, and language of the studies are detailed in Table 1 below.

Table 1. Data from the analyzed studies.

Title	Authors	Journal	Year	Country	Language
A Study of Reliability and Validity of Preschool Play Scale	Bledsoe, N.P., & Shepherd, J.T.	The American Journal of Occupational Therapy	1982	United States	English
A comparison of play behavior in nonhospitalized and hospitalized children	Kielhofner, G., Barris, R., Bauer, D., Showestock, B., & Walker, L.	The American Journal of Occupational Therapy	1983	United States	English
Developmental play ages of Physically Abused and Nonabused Children	Howard, A.C.	The American Journal of Occupational Therapy	1986	United States	English

Table 1. Continued...

Title	Authors	Journal	Year	Country	Language
Examining Reliability and Validity of the Preschool Play Scale With Handicapped Children	Harrison, H., & Kielhofner, G.	The American Journal of Occupational Therapy	1986	United States	English
A comparison of the play skills of normal boys and boys with Sensory Integrative Dysfunction	Bundy, A.C.	The Occupational Therapy Journal of Research	1989	United States	English
Occupational Therapy in Early Intervention: A family-centered approach	Schaaf, R.C., & Mulrooney, L.L.	The American Journal of Occupational Therapy	1989	United States	English
Play preference and play performance in normal boys and boys with Sensory Integrative Dysfunction	Clifford, J.M., & Bundy, A.C.	The Occupational Therapy Journal of Research	1989	United States	English
A pilot study of Differences in Play Behavior Between Children of Low and Middle Socioeconomic Status	Von Zuben, M.V., Crist, P.A., & Mayberry, W.	The American Journal of Occupational Therapy	1990	United States	English
The contribution of motor skills and playfulness to the play performance of preschoolers	Morrison, C.D., Bundy, A.C., & Fisher, A.G.	The American Journal of Occupational Therapy	1991	United States	English
Play and Preschool Children With Autism	Restall, G., & Magill-Evans, J.	The American Journal of Occupational Therapy	1994	Canada	English
Play Skills of Preschool Children with Speech and Language Delays	Shepherd, J.T., Brollier C.B., & Dandrow R.L.	Physical & Occupational Therapy in Pediatrics	1994	United States	English
The impact of Occupational Therapy on a Child's Playfulness	O'Brien, J. et al.	Occupational Therapy in Health Care	2000	United States	English
A comparison of the play performance of boys with autism and that of boys without disabilities in Taiwan	Lee, I.	These - University of Southern California	2003	Taiwan	English
O brincar e a terapia ocupacional no projeto creche das rosinhas	Magalhães, M.E.N. et al.	Anais 6º Encontro de Extensão da UFMG	2003	Brazil	Portuguese
Creating an intervention plan to promote playfulness in a child with special needs	Hindmarsh-Hook, W.A.	New Zealand Journal of Occupational Therapy	2005	New Zealand	English
The effects of Peer-Play Level on Initiations and Responses of Preschool Children With Delayed Play Skills	Tanta, K.J., Deitz O.W., & Bilingsley, F.	The American Journal of Occupational Therapy	2005	United States	English
The play behaviour of children with and without autistic disorder in a clinical environment	Ziviani, J., Rodger, S., & Peters, S.	New Zealand Journal of Occupational Therapy	2005	Australia	English
Avaliação do comportamento Lúdico de crianças com sequelas de Paralisia Cerebral Espástica	Rocha e Silva, L.C.R.	Completion of course work – Universidade de São Paulo	2006	Brazil	Portuguese
Comportamento Lúdico de Crianças com Síndrome de Down	Solai, V.Q.	Completion of course work – Universidade de São Paulo	2006	Brazil	Portuguese
Influência do brincar para o desenvolvimento de crianças institucionalizadas de 3 a 6 anos	Pfeifer, L.I., & Eufrazio, M.C.	Temas sobre desenvolvimento	2006	Brazil	Portuguese
The play of children with special needs in mainstream and special education settings	Bray, P., & Cooper, R.	Australian Journal of Early Childhood	2007	Australia	English
Play behavior of school age children with intellectual disability: Their capacities, interests and attitude	Messier, J., Ferland, F., & Majnemer, A.	Journal of Developmental and Physical Disabilities	2008	Canada	English
Revised knox preschool play scale: Interrater agreement and construct validity	Jankovich, M. et al.	The American Journal of Occupational Therapy	2008	United States	English
Inter-rater reliability and concurrent validity of the preschool play scale with preschool children with autism spectrum disorders	Lee, S.C., & Hinojosa, J.	Journal of Occupational Therapy, Schools, & Early Intervention	2010	United States	English
Preliminary reliability and repeatability of the Brazilian version of the revised knox preschool play scale	Pacciullo, A.M., Pfeifer, L.I., & Santos, J.L.F.	Occupational Therapy International	2010	Brazil	English
O brincar de crianças pré-escolares moradoras de áreas de alta vulnerabilidade social	Mannini, J., & Pfeifer, L.I.	Anais do 18º Simpósio Internacional de Iniciação Científica e Tecnológica da	2010	Brazil	Portuguese

Table 1. Continued...

Title	Authors	Journal	Year	Country	Language
		Universidade de São Paulo			
Habilidades de desempenho no brincar de crianças com paralisia cerebral	Pfeifer, L.I., Pereira, L.C.R.S., Silva, D.B.R., & Panuncio-Pinto, M.P.	Arquivos Brasileiros de Paralisia Cerebral	2011	Brazil	Portuguese
Physical and social play of preschool children with and without coordination difficulties: Preliminary findings	Kennedy-Behr, A., Rodger, S., & Mickan, S.	British Journal of Occupational Therapy	2011	Germany	English
Adaptação transcultural da Escala Lúdica Pré-escolar de Knox - revisada para uso na população brasileira	Sposito, A.M.P., Pfeifer, L.I., & Santos, J.	Interação Psicologia	2012	Brazil	Portuguese
A pilot study comparison of sensory integration treatment and integrated preschool activities for children with autism	Dunbar, S.B.	Internet Journal of Allied Health Sciences and Practice	2012	United States	English
Comportamento lúdico de crianças pré-termo e seu desenvolvimento neuropsicomotor	Rombe, P.G.	Dissertation - Universidade Federal de São Carlos	2012	Brazil	Portuguese
L'appui de l'environnement pour développer le jeu libre chez l'enfant une étude expérimentale sur l'aménagement d'une salle de jeu multi-âge au niveau préscolaire	Dufresne, E.L.	Dissertation - Université du Québec	2012	Canada	French
A comparison of the play skills of preschool children with and without developmental coordination disorder.	Kennedy-Behr, A., Rodger, S., & Mickan, S.	ORTJ: Occupation, Participation, and Health	2013	Germany	English
Creating enabling environments at preschool for children with developmental coordination disorder	Kennedy-Behr, A., Rodger, S., & Mickan, S.	Journal of Occupational Therapy, Schools, & Early Intervention	2013	Germany	English
Free play time of children with learning disabilities in a noninclusive preschool setting: An analysis of play and nonplay behaviours	Fallon, J., & Maccobb, S.	British Journal of Learning Disabilities	2013	Ireland	English
Development of play profiles: influence of disability on children's play	Emblen, T., & Stagnitti, K.	Dissertation - Deakin University	2014	Australia	English
To study the effectiveness of play based therapy on play behaviour of children with Down's Syndrome.	Solanki, P.V., Gokhale, P., & Agarwal, P.	Indian Journal of Occupational Therapy	2014	India	English
Efficacy of a crisis intervention in improving mother-child interaction and children's play functioning	Waldman-Levi, A., & Weintraub, N.	American Journal of Occupational Therapy	2015	Israel	English
Terapia Ocupacional y el juego en población infantil del municipio de Tangua	García, O.A.J.	Revista Críterios	2015	Colombia	Spanish
O brincar de crianças com doenças crônicas hospitalizadas	Grigolatto, T., Sposito, A.M.P., Panuncio-Pinto, M.P., & Pfeifer, L.I.	Revista Ciência e Saúde On-line	2016	Brazil	Portuguese
Valoración del programa comunitario Bienestar y Desempeño Ocupacional	Parra-Esquivel, E.I., & Peñas-Feizzola, O.L.	Revista de la Facultad de Medicina	2016	Colombia	Spanish
Comportamento lúdico como indicador de desempenho infantil: influência da família, ambiente escolar e condições de trabalho das professoras de creches públicas de Diamantina (MG)	Lemos, A.C.	Dissertation - Universidade Federal dos Vales do Jequitinhonha e Mucuri	2017	Brazil	Portuguese
Descrição do brincar exploratório de crianças com Síndrome de Down	Malaquini, C.X., & Pfeifer, L.I.	Anais do 25º Simpósio Internacional de Iniciação Científica e Tecnológica da Universidade de São Paulo	2017	Brazil	Portuguese
Effects of Moderate Pressure Massage on Self-Regulation and Play in Preterm Babies	Hendel, H.C.	These - Nova Southeastern University	2017	United States	English
Preoccupations to Occupations: Bridging the Gap in Toddlers and Preschoolers with Autism Spectrum Disorders	Swaminathan, A.	The Indian Journal of Occupational Therapy	2017	India	English

Table 1. Continued...

Title	Authors	Journal	Year	Country	Language
Analyzing The Relationships between Preschool Children's Play Skills and Their Social Competence and Emotion Regulation Skills	Balat, G.U. et al.	Croatian Journal of Education	2018	Túrcia	English
Confiabilidade e validação de conteúdo da Escala Lúdica Pré-Escolar de Knox - revisada para a população brasileira	Sposito, A.M.P.	These - Universidade de São Paulo	2018	Brazil	Portuguese
Influence of functional mobility and manual function on play in preschool children with cerebral palsy	Angelin, A.C., Sposito, A.M.P., & Pfeifer, L.I.	Hong Kong Journal of Occupational Therapy	2018	Brazil	English
The contribution of occupational therapy in the holistic management of a child with tetra-amelia syndrome	Pretorius, M.N.	These - University of Pretoria	2018	South Africa	English
Play and Movement in 6-Month-Old Infants Later Diagnosed with Autism: A Pilot Study	Demchick, B.B., Flanagan, J., Parete, T., & Matteo, D.	Journal of Occupational Therapy, Schools, & Early Intervention	2019	United States	English
Validation of the Revised Knox Preschool Play Scale for the Brazilian Population	Sposito, A.M.P., Santos, J.L.F., & Pfeifer, L.I.	Occupational Therapy International	2019	Brazil	English

Most studies used only ELPK (n=24); however, its use associated with 36 other assessment instruments was identified, especially the ToP - Test of Playfulness (n=6).

The ELPK was considered valid to indicate the stage of development of play skills in which the child, and it was found that its division into age groups reflects the chronological ages of typical child development. This instrument allows the investigation of skills in different domains of development, encompassing motor, social, cognitive, and language aspects. Inter-examiner reliability and concurrent and construct validity were investigated, and all were considered adequate. The non-requirement of standardized materials and specific environments for the application of the scale were also seen as favoring its use. All these potentialities indicate that the ELPK is useful to assess child development through play in clinical and academic practice.

Despite these potentialities, weaknesses in the instrument were indicated, such as the lack of a manual or detailed guideline on the form of application and on the evaluated behaviors, the difficulty of evaluating all the skills based only on the observation of free play, and the need for a long evaluation time. These factors suggest the importance of refining the scale to enhance its usefulness and relevance to the practice of occupational therapy.

Discussion

The review showed that the Knox Preschool Playful Scale has been used, since its creation, in several studies around the world with different proposals and objectives.

Most of the articles found are scientific productions, which is justified by the greater availability of this type of publication in internationally accessible databases, and dissertations, theses, course conclusion works, and abstracts in revised proceedings are generally Brazilian, except for Australian (Emblen, 2014), South African (Pretorius, 2018) and Canadian (Dufresne, 2012) dissertations and an American thesis (Lee, 2003), due to the difficulty of searching these productions.

Although the scale was created in 1969, it was only in the 1980s that authors (Bledsoe & Shepherd, 1982; Harrison & Kielhofner, 1986) applied this instrument in their studies, performing a critical analysis of its reliability and validity. These authors pointed out necessary modifications to favor the applicability of the scale, such as the

removal of the evaluation domains “music”, “books” and “territory”. From then on, until the publication of the revised version of the instrument, few other studies were carried out; however, each author made changes to the scale to adapt it to the interests of their specific study. These modifications included the variation of the child's observation time and the exclusion of items from the assessment, as indicated by Couch (1996) in a literature review on the use of the ELPK.

After Susan Knox made official the changes suggested by Bledsoe & Shepherd (1982) and Harrison & Kielhofner (1986) and updated the scale according to the advances in knowledge at the time about the development of play, its revised version (1997) was published (in an American occupational therapy book) which gradually became more used in research. It is believed that the fact that a group of Brazilian researchers carried out the cross-cultural adaptation and started the ELPK_r validation process has significantly contributed to the increase in publications after 2006. Thus, there is a great polarization of the reviewed studies, which were developed mostly in the United States and Brazil. No translation and validation studies of the scale were found in other countries, which may explain the little use of ELPK_r in the world. For an instrument to be used in a new population, it must first go through a standardized process of translation and cultural adaptation of its items (Beaton et al., 2000). The performance of metrics through validation tests of instruments that have undergone a cross-cultural adaptation process is essential to maintain the quality and effectiveness of the assessment in different contexts and populations (Gorla et al., 2021).

The instrument was rarely used by other professionals (Bray & Cooper, 2007; Balat et al., 2018), and its use was generally restricted to occupational therapists. ELPK_r has the potential to be used by educators, psychologists, and professionals who work with child development. However, it is believed that the intrinsic relationship between play and child development is very natural and pertinent to the practice of occupational therapists since these professionals work not only with a focus on developmental changes, but also aim and favor engagement in meaningful occupations for individuals, such as play for preschool children.

Couch et al. (1998) mentioned that the ELPK was developed for research and that the fact that this instrument is not commercialized makes access and use difficult for professionals, even occupational therapists, who work clinically.

Although the assessment of play is extremely important for clinical and academic practice, this is not an easy construct to measure (Jankovich et al., 2008). Sometimes, the use of more than one instrument in the same study is necessary to expand the amount of data collected, either for further research or for therapeutic planning (Gorla et al., 2021). We observed that several authors associated the use of ELPK with several other instruments, especially the ToP - Test of Playfulness. O'Brien et al. (2000) states that the ELPK examines the skills present in the play, but does not assess the behavior, the playful attitude. The ToP, on the other hand, is a possibility of direct evaluation of internal control, intrinsic motivation, and suspension of reality - components of ludic behavior (Bundy, 1997), contributing to the expansion of investigation and understanding of the performance of the play.

Assessing playing is complex and time-consuming, as it requires observation of the child in the performance of this occupation, preferably in multiple environments (Jankovich et al., 2008; Knox, 2010).

Several studies have pointed out that, during the application of the ELPKr, some behaviors and actions were not presented by the children evaluated, which raised the question of the real capacity of these children (Harrison & Kielhofner, 1986; Shepherd et al., 1994; Restall & Magill-Evans, 1994; Rocha & Silva, 2006; Emblen, 2014; Grigolatto, 2006; Sposito, 2018). These authors questioned whether the children did not perform the tasks mentioned in the scale because they did not have the ability/capacity to do so, or if they just lacked interest or even thought about the possibility of performing exactly that action, since the assessment is only observational of free playing, allowing that the child performs a multitude of tasks, but not necessarily those evaluated in the instrument, leading to a false deficit result. These results indicate that the way to apply the ELPKr needs to be refined (Harrison & Kielhofner, 1986; Jankovich et al., 2008; Emblen, 2014; Grigolatto, 2006; Sposito, 2018).

Seeking to overcome this bias in the analysis of the performance of those evaluated, studies have suggested adding playful evaluations through targeted activities, inviting and encouraging children to perform specific tasks that were not included in the observation of free play, allowing an evaluation closer to the real ability of these children (Ziviani et al., 2005; Jankovich et al., 2008; Mannini et al., 2010; Rombe, 2012; Malaquini & Pfeifer, 2017; Sposito, 2018; Angelin et al., 2018). Jankovich et al. (2008) also suggests that the evaluator add occasional clarifying questions to the observation (for example, “What are you doing?”) to facilitate the interpretation of behaviors and obtain reliable analyzes of children’s performance.

Some studies (Lee, 2003; Jankovich et al., 2008; Fallon & MacCobb, 2013; Emblen, 2014; Sposito, 2018) have also pointed out the difficulty that evaluators have to understand what exactly is being evaluated in each item of the scale, leading to a variety of interpretations that negatively influence the inter-examiner reliability of the instrument. Fallon & MacCobb (2013) highlighted the importance of prior training of evaluators. According to Jankovich et al. (2008), the inter-examiner reliability of the scale is acceptable; however, two independent and trained evaluators score the performance of the same child with a mean difference of eight months in the final overall age score of the ELPKr. This difficulty is due to the lack of a manual or at least a more detailed explanation of the behavior/action being evaluated and of how to evaluate each of these items (Jankovich et al., 2008; Emblen, 2014; Sposito, 2018; Sposito et al., 2019).

In this sense, some studies (Rocha & Silva, 2006; Solai, 2006; Emblen, 2014; Pacciulio et al., 2010; Pfeifer et al., 2011; Sposito et al., 2012, 2019; Sposito, 2018) adopted a score for each item on the scale, aiming to advance in the refinement of the instrument, to allow a clear, detailed and standardized quantification of the child’s performance, instead of classifying only the general age of the development of playing, as proposed by Knox (2002).

Despite these weaknesses, ELPKr has numerous potentials, which make it a useful instrument for clinical practice. Shepherd et al. (1994) confirmed the validity of the scale for identifying developmental delays in preschool children. Its application is relatively easy, as it does not require a specific environment, equipment, or materials (Shepherd et al., 1994; Rocha & Silva, 2006). Studies have indicated the concurrent and construct validity of the scale (Bledsoe & Shepherd, 1982; Harrison & Kielhofner, 1986; Shepherd et al., 1994; Jankovich et al., 2008; Lee & Hinojosa, 2010).

A long observation may be necessary to reach the assessment of most items of the instrument (Bray & Cooper, 2007). Some authors selected parts of the instrument to use in their studies (von Zuben et al., 1991; Ziviani et al., 2005; Waldman-Levi & Weintraub, 2015). Sposito (2018) proposed an adaptation of the Brazilian version of the ELPK_r to facilitate its use in clinical practice, reducing the number of items, allowing the scale to be applied more quickly and adapted to the needs of professionals in a clinical context.

In general, although refinements have been suggested, the ELPK is considered useful for the clinical and academic practice of occupational therapists who work with a child population with and without pathologies.

Final Considerations

This study carried out a qualitative analysis of the use of ELPK_r in the national and international literature. This instrument was used in several countries with different objectives and diagnoses (typical development, with pathologies, social vulnerability, genetic syndromes, and neurological disorders), proving its usefulness in clinical practice in different contexts. The results showed that ELPK_r is not very popular among other professionals and that most of the studies were published as scientific articles (n=38). Considering that studies that use the scale are generally published in occupational therapy journals (n=28), future research must be also published in generic journals and in a more accessible way, ensuring the dissemination of the use of the scale and the importance of evaluating playing among the various professionals who work with preschool children.

From this scoping review, we obtained a broad panorama of data on the use, dissemination, and availability of this instrument.

As limitations of this study, it should be noted that in-depth analyzes of research methodologies, levels of scientific evidence, and statistics used in the studies were not carried out, factors that would contribute to a more consistent qualitative analysis.

This study analyzed the weaknesses and strengths of ELPK_r, suggesting the importance of refinements in this scale to enhance its usefulness and relevance for the practice of occupational therapy.

References

- American Occupational Therapy Association – AOTA. (2020). Occupational therapy framework: domain and process. *The American Journal of Occupational Therapy*, 74(Supl. 2), 1-87. <http://dx.doi.org/10.5014/ajot.2020.74S2001>.
- Angelin, A. C., Sposito, A. M., & Pfeifer, L. I. (2018). Influence of functional mobility and manual function on play in preschool children with cerebral palsy. *Hong Kong Journal of Occupational Therapy*, 31(1), 46-53. <http://dx.doi.org/10.1177/1569186118783889>.
- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32. <http://dx.doi.org/10.1080/1364557032000119616>.
- Balat, G. U., Çiftçi, H. A., Unsal, O., Kilic, Z., & Değirmenci, S. (2018). Analyzing the relationships between preschool children's play skills and their social competence and emotion regulation skills. *Croatian Journal of Education*, 20(3), 243-257. <http://dx.doi.org/10.15516/cje.v20i0.3037>.

- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186-3191. <http://dx.doi.org/10.1097/00007632-200012150-00014>.
- Bledsoe, N. P., & Shepherd, J. T. (1982). A study of reliability and validity of a preschool play scale. *The American Journal of Occupational Therapy*, 36(12), 783-788. <http://dx.doi.org/10.5014/ajot.36.12.783>.
- Bray, P., & Cooper, R. (2007). The play of children with special needs in mainstream and special education settings. *Australasian Journal of Early Childhood*, 32(2), 37-42. <http://dx.doi.org/10.1177/183693910703200207>.
- Bundy, A. C. (1997). Play and playfulness: what to look for. In L. D. Parham & L. S. Fazio (Eds.), *Play in occupational therapy for children* (pp. 52-66). St. Louis: Mosby-Year Book Inc.
- Couch, K. J. (1996). The use of the preschool play scale in published research. *Physical & Occupational Therapy in Pediatrics*, 16(4), 77-84. http://dx.doi.org/10.1300/J006v16n04_05.
- Couch, K. J., Deitz, J. C., & Kanny, E. M. (1998). The role of play in pediatric occupational therapy. *The American Journal of Occupational Therapy*, 52(2), 111-117. <http://dx.doi.org/10.5014/ajot.52.2.111>.
- Dufresne, E. L. (2012). *L'appui de l'environnement pour développer le jeu libre chez l'enfant une étude expérimentale sur l'aménagement d'une salle de jeu multi-âge au niveau préscolaire* (Dissertação de mestrado). Université du Québec, Québec.
- Emblen, T. (2014). *Development of play profiles: influence of disability on children's play* (Dissertação de mestrado). Deakin University, Austrália.
- Fallon, J., & MacCobb, S. (2013). Free play time of children with learning disabilities in a noninclusive preschool setting: an analysis of play and nonplay behaviours. *British Journal of Learning Disabilities*, 41(1), 212-219. <http://dx.doi.org/10.1111/bld.12052>.
- Ferland, F. (2006). *O modelo lúdico: o brincar, a criança com deficiência física e a terapia ocupacional*. São Paulo: Roca.
- Gorla, J. A., Martinez, C. M. S., Figueiredo, M. O., & Cruz, D. M. C. (2021). Revisão de escopo sobre o instrumento "Occupational Performance History Interview – II": perspectivas para o seu uso no Brasil. *Cadernos Brasileiros de Terapia Ocupacional*, 29, e2808. <http://dx.doi.org/10.1590/2526-8910.ctoAR2123>.
- Grigolato, T. (2006). *Avaliação do comportamento lúdico em crianças portadoras de doenças crônicas hospitalizadas* (Trabalho de conclusão de curso). Universidade de São Paulo, Ribeirão Preto.
- Harrison, H., & Kielhofner, G. (1986). Examining reliability and validity of the preschool play scale with handicapped children. *The American Journal of Occupational Therapy*, 40(3), 167-173. <http://dx.doi.org/10.5014/ajot.40.3.167>.
- Jankovich, M., Mullen, J., Rinear, E., Tanta, K., & Deitz, J. (2008). Revised Knox Preschool Play Scale: interrater agreement and construct validity. *The American Journal of Occupational Therapy*, 62(2), 221-227. <http://dx.doi.org/10.5014/ajot.62.2.221>.
- Knox, S. H. (2002). Desenvolvimento e uso corrente da Escala Lúdica Pré-Escolar de Knox. In L. D. Parham & L. S. Fazio (Eds.), *A recreação na terapia ocupacional pediátrica* (pp. 35-51). São Paulo: Santos.
- Knox, S. H. (2010). Play. In J. Case-Smith & J. C. O'Brien (Eds.), *Occupational therapy for children* (pp. 571-586). St. Louis: Mosby.
- Lee, I. (2003). *A comparison of the play performance of boys with autism and that of boys without disabilities in Taiwan* (Tese de doutorado). University of Southern California, Califórnia.
- Lee, S. C., & Hinojosa, J. (2010). Inter-rater reliability and concurrent validity of the preschool play scale with preschool children with autism spectrum disorders. *Journal of Occupational Therapy, Schools, & Early Intervention*, 3(2), 154-167. <http://dx.doi.org/10.1080/19411243.2010.491015>.
- Malaquini, C. X., & Pfeifer, L. I. (2017). Descrição do brincar exploratório de crianças com síndrome de down. In *Anais do Simpósio Internacional de Iniciação Científica e Tecnológica da USP (SIICUSP)*. Ribeirão Preto: FMRP/USP.

- Mannini, J., Panúncio-Pinto, M. P., & Pfeifer, L. I. (2010). O brincar de crianças pré-escolares moradoras de áreas de alta vulnerabilidade social. In *Anais do Simpósio Internacional de Iniciação Científica e Tecnológica da USP (SIICUSP)*. Ribeirão Preto: FMRP/USP.
- O'Brien, J., Coker, P., Lynn, R., Suppinger, R., Pearigen, T., Rabon, S., St. Aubin, M., & Ward, A. T. (2000). The impact of occupational therapy on a child's playfulness. *Occupational Therapy in Health Care, 12*(2-3), 39-51. http://dx.doi.org/10.1080/J003v12n02_03.
- Pacciullo, A. M., Pfeifer, L. I., & Santos, J. L. (2010). Preliminary reliability and repeatability of the Brazilian version of the Revised Knox Preschool Play Scale. *Occupational Therapy International, 17*(2), 74-80. <http://dx.doi.org/10.1002/oti.289>.
- Pfeifer, L. I., & Stagnitti, K. (2020). Terapia learn to play: intervenção de terapia ocupacional para desenvolver o brincar de faz de conta. In L. I. Pfeifer & M. M. M. Sant'Anna (Eds.), *Terapia ocupacional na infância: procedimentos na prática clínica* (pp. 400-420). São Paulo: Memnon.
- Pfeifer, L. I., Pereira, L. C. R. S., Silva, D. B. R., & Pinto, M. P. P. (2011). Habilidades de desempenho no brincar de crianças com paralisia cerebral. *Arquivos Brasileiros de Paralisia Cerebral, 5*(12), 4-11.
- Pretorius, M. N. (2018). *The contribution of occupational therapy in the holistic management of a child with Tetra-Amelia Syndrome* (Dissertação de mestrado). University of Pretoria, Pretoria.
- Restall, G., & Magill-Evans, J. (1994). Play and preschool children with autism. *The American Journal of Occupational Therapy, 48*(2), 113-120. <http://dx.doi.org/10.5014/ajot.48.2.113>.
- Richardson, P. K. (2010). Use of standardized tests in pediatric practice. In J. Case-Smith & J. C. O'Brien (Eds.), *Occupational therapy for children* (pp. 246-275). Maryland Heights: Mosby.
- Rocha e Silva, L. C. R. (2006). *Avaliação do comportamento lúdico de crianças com sequela de Paralisia Cerebral Espástica* (Trabalho de conclusão de curso). Universidade de São Paulo, Ribeirão Preto.
- Rombe, P. G. (2012). *Comportamento lúdico de crianças pré-termo e seu desenvolvimento neuropsicomotor* (Dissertação de mestrado). Universidade Federal de São Carlos, São Carlos.
- Sant'Anna, M. M. M. (2020). *Instrumentos de avaliação do modelo lúdico para crianças com deficiência física (EIP-ACL)*. São Carlos: ABPEE; M&M Editora.
- Shepherd, J., Brollier, C. B., & Dandrow, R. L. (1994). Play skills of preschool children with speech and language delays. *Physical & Occupational Therapy in Pediatrics, 14*(2), 1-20. http://dx.doi.org/10.1080/J006v14n02_01.
- Solai, V. Q. (2006). *Comportamento lúdico de crianças com Síndrome de Down* (Trabalho de conclusão de curso). Universidade de São Paulo, Ribeirão Preto.
- Sposito, A. M. P. (2018). *Confiabilidade e validação de conteúdo da Escala Lúdica Pré-Escolar de Knox: revisada para a população brasileira* (Tese de doutorado). Universidade de São Paulo, Ribeirão Preto.
- Sposito, A. M. P., Pfeifer, L. I., & Santos, J. L. F. (2012). Adaptação transcultural da escala lúdica pré-escolar de Knox – revisada para uso na população brasileira. *Interação em Psicologia, 16*(2), 149-160.
- Sposito, A., Santos, J., & Pfeifer, L. I. (2019). Validation of the Revised Knox Preschool Play Scale for the Brazilian Population. *Occupational Therapy International, 2019*, 1-5. <http://dx.doi.org/10.1155/2019/6397425>.
- Sposito, A. M. P., & Pfeifer, L. I. (2020). Definindo os objetivos de terapia ocupacional a partir da escala lúdica pré-escolar de Knox: revisada. In L. I. Pfeifer & M. M. M. Sant'Anna (Eds.), *Terapia ocupacional na infância: procedimentos na prática clínica* (pp. 82-99). São Paulo: Memnon.
- von Zuben, M. V., Crist, P. A., & Mayberry, W. (1991). A pilot study of differences in play behavior between children of low and middle socioeconomic status. *The American Journal of Occupational Therapy, 45*(2), 113-118. <http://dx.doi.org/10.5014/ajot.45.2.113>.
- Waldman-Levi, A., & Weintraub, N. (2015). Efficacy of a crisis intervention in improving mother-child interaction and children's play functioning. *The American Journal of Occupational Therapy, 69*(1), 1-11. <http://dx.doi.org/10.5014/ajot.2015.013375>.
- Ziviani, J., Rodger, S., & Peters, S. (2005). The play behaviour of children with and without autistic disorder in a clinical environment. *New Zealand Journal of Occupational Therapy, 52*(2), 22-30.

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