Family poverty, neuropsychomotor development and children's play in the insular and continental regions of Belém

Pobreza familiar, desenvolvimento neuropsicomotor e brincadeiras de crianças de regiões insular e continental de Belém*

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ABSTRACT: The aim of this study was to investigate the association between family poverty, neuropsychomotor development and children's play in two contexts (insular and continental) in the municipality of Belém. This is a cross-sectional study, with a descriptive-exploratory character, in which 319 children participated, ranging from three to four years of age. The Denver Developmental Screening Test II was used, in addition to a questionnaire to identify the socio-economic conditions of the families and the characteristics of games, in addition to an instrument to measure the level of family poverty. The χ^2 test was used, with a 5% significance level (p-value <0.05). Of the 319 children evaluated, the percentage of suspected delay in development reached 77.7%. The level of family poverty (p=0.01) is associated to the type of game. The variable of space to play was associated with the geographic context of the municipality (p=0.004). We hope that this study may contribute to understanding the importance of playing in development contexts marked by family poverty and in regions with peculiar characteristics, such as the Amazon, and the adequacy of public policies.

Keywords: Child; Child development; Poverty; Play and playthings.

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RESUMO: O objetivo deste estudo foi investigar a associação entre pobreza familiar, desenvolvimento neuropsicomotor e brincadeiras de crianças de dois contextos (insular e continental) do município de Belém. Trata-se de um estudo transversal, com caráter descritivo-exploratório, do qual participaram 319 crianças na faixa etária de três a quatro anos de idade. Utilizou-se o Teste de Triagem do Desenvolvimento de Denver II, um questionário para identificar as condições socioeconômicas da família e características das brincadeiras, além de um instrumento de medição do nível de pobreza familiar. Foi usado o teste χ^2, com nível de significância de 5% (p-valor <0.05). Das 319 crianças avaliadas, o percentual de suspeita de atraso no desenvolvimento chegou a 77.7%. O nível de pobreza da família (p=0.01) associou-se ao tipo de brincadeira. Já a variável de espaço para brincar associou-se com o contexto geográfico do município (p=0,004). Considera-se que este estudo pode colaborar para o entendimento da importância das brincadeiras em contextos de desenvolvimento marcados pela pobreza familiar e em regiões com características peculiares como a Amazônia e para a adequação das políticas públicas.

Descritores: Criança; Desenvolvimento infantil; Pobreza; Jogos e brinquedos.

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INTRODUCTION

The neuropsychomotor development (NPMD) is the succession of steps resulting from the interaction between biological and genetic potential, and environment. It is a change process in motor, psychomotor and linguistic behaviors, according to the maturation of the central nervous system[1]. Development has been studied based on different theoretical perspectives and ecological models. In Bronfenbrenner's model[2], the development is understood from proximal processes, considering the context in which the person interacts dynamically and the multitude of ecological elements (activities, relationships and roles). In this perspective, playing has a central role for a proper NPMD, since it allows the stimulation of motor, cognitive and social skills[3,4]. In addition, investigating ludic spaces contributes to clarify the relation between child, environment and development[5].

Studies on playing are being carried out in several contexts, whether rural - with traditional populations such as ribeirinhos[6], indigenous people[7] and colonists[8,9] - or urban, in kindergartens and schools[10-12], public parks[13,14] and neighborhoods[15,16]. Despite the geographic and cultural diversity of Brazil, there are few comparative studies between these different contexts, especially in the same municipality. It is the case of Belém (PA), located in the Amazon region, involving two distinct geographic contexts, one continental and one insular.

The insular region (66% of the territory) is composed of islands inhabited by traditional populations and with characteristics of the Amazon rural area. The center of the continental part of Belém is the most consolidated portion of the urban space, with greater concentration of services and infrastructure. However, in both territories there are asymmetries between socioeconomic and administrative standards, resulting in lack of access to resources and basic services, segregation, favelas and public health problems[18].

Belém has a high poverty index in relation to the metropolises of Brazil[18]. This means that about 54% of the population that lives in the metropolitan part of Belém resides in favela areas, that is, approximately 1.39 million inhabitants. The percentage of residents in the favelas of Belém is greater than in the metropolitan areas in Rio de Janeiro (15%), Salvador (25%) and Recife (20%). Thus, this study was guided by the hypothesis that many children in the municipality are developed according to the socioeconomic level (SEL) of their families and to the territory they live (insular or continental). This assumption is worrisome, since the exposition of a child to poverty involves chronic aspects, which interfere negatively in childhood and adulthood[19-21]. These conditions imply stimuli and resources offered by the family ecological environment, such as activities, relationships and roles[2].

Poverty also affects ludic activities, generating less or worse intentional organization of the physical space, time to play and/or few adequate objects to stimulate their imagination, that is, some children play with what they have and not with what they would like[8,9,22]. Therefore, to describe the games found in different contexts allows to know the development processes and specificities of this activity[5,23].

Given this, the Study Group on Early Childhood Education and Development (GEEID – Grupo de Estudos em Educação Infantil e Desenvolvimento), from the Laboratory of Ecology of Human Development of the Universidade Federal do Pará, performs since 2012 researches that seek to understand the NPMD of children in Belém enrolled in Early Childhood Education Units (UEI – Unidades de Educação Infantil) in a bioecological perspective, in order to investigate the domains of development in natural environments. The objective of this study was to investigate the association between poverty, NPMD and games played by children who live in Belém, in the insular and continental contexts.

METHODOLOGY

Participants

319 children participated of this study, enrolled in the public UEIs of Belém in the year of 2012. Of these, 55.8% (179) were male and 44.2% (141) were female, with average age of 41.9 months (SD=8.8%). The inclusion criteria were: typical children, of both sexes, ranging from 36 to 48 months of age. The children who had a neurological, motor and/or sensorial dysfunction or any type of pathology previously diagnosed were excluded from the study. A cluster sampling process was used, with a significance level of 5% and power of test of 80% for the sample calculation. Since the study population consisted of 1,201 subjects, the sample size was 300 children. A proportional division was performed to establish the quantity of children and UEI in each district, in order to reach a representative sample.

Environment

The UEI involved in the research were drawn proportionally in the eight administrative districts of the municipality, two from the insular region and six from the continental one. Likewise, the number of participant individuals was defined in each district. The draw for the UEI was conducted by the Research Randomizer software.

From the sample calculation, the study involved 19 UEI of a total of 35 units, distributing them in two groups, namely: UEI of the Insular Belém (*n*=3) and UEI of the Continental Belém (*n*=16).

Instruments

To screen the NPMD, the Denver Developmental Screening Test II[24] was used, applied to children from zero to six years. The test is composed of 125 tasks, divided in four areas: personal-social, language, and fine and wide motor skills. Its administration consists in observing the child in a certain task, although some items are asked to their parents or guardians.

To score the items, the answers referring to the performance of the child can be classified as: "adequate", when the child succeeds or fails in a task that 25% to 75% of the referred population can perform; "caution", when the child cannot perform a task that 75% to 90% of their peers can do; and "delay", when they are not able to perform a task that more than 90% of the children of the same age can carry out. At the end, the following scores are generated: a) Normal – no delay item and at most one caution; b) Suspected delay – two or more caution items and/or one or more delay items; c) Non-applicable – when there was refusal in one or more items completely to the left of the age line, or one or more items that intersect the age line between the percentile 75 and 90[24]. The Denver II test has good reliability indexes, with 0.99 interobserver and 0.9 in test/re-test[24].

The level of family poverty was measured by the instrument translated and adapted in Brazil by Issler and Giugliani[25]. This instrument allows to identify several descriptors of the SEL and is composed of thirteen items, among them: social vulnerability, parents' educational level and occupation, housing conditions and availability of services and resources. Each item can be scored in a scale from 0 to 4 points, with a minimal score of 7 and maximum of 52 points. Finally, the total sum of each item establishes the level of family poverty. For statistical analysis, it is recommended to divide the study population into quartiles, according to the score obtained in the classification of the poverty level.

The characteristics of playing were collected through the Questionnaire of Biopsychosocial Child Characteristics (QBCC), created by the researchers. The questionnaire consists of 48 questions, structured around the following categories: identification of children and parents (nineteen questions); pre, peri and postnatal history (six questions); socioeconomic and environmental conditions (twenty questions); playing environment (three questions). Thus, the specific variables of playing investigated in this study were: types of games, playing spaces and most common games.

Data collection procedures

Initially, authorization was requested to the Municipal Education Department to carry out this research. After the favorable opinion of the agency, the project was forwarded to the Research Ethics Committee of the Center for Tropical Medicine (NMT/UFPA), being approved under protocol no. 167.271/2012. Procedures used followed the ethics criteria in research with human beings, according to resolution no. 196/1996 of the National Health Council, in force at the time, but in accordance with Resolution no. 466/2012. In addition, authorization was requested from participants and guardians through the Informed Consent Form (ICF). The Denver II was applied to children in the UEI school period, respecting their activities. As for the other instruments, they were applied to the parents when the children arrived and left school.

Data analysis

Data analysis was performed through the *SPSS* 20.0. Descriptive statistics was used to characterize the sample and describe the Denver II scores. Furthermore, associations were observed between: development score – Denver II (dependent variable – DV) and level of familiar poverty (independent variable – IV); type of game (DV) and level of family poverty (IV); and playing space (DV) and geographic context of the municipality (IV). The Chi-square test was used, with a 5% significance level (p-value <0.05). Finally, the K-means non-hierarchical cluster analysis was performed. To confirm if the groups were reliable and coherent, the clusters were assessed through discriminant analysis, with the objective of showing if the individuals were correctly assembled in the three groups predicted by the K-means.

RESULTS

Regarding the relation between the NPMD and the level of family poverty, it was verified that 27.3% was in the bottom quartile (poorest families), and the majority (72.7%) belonged to the other quartiles. The minimum score was 28 points and the maximum was 52, with an average of 44 points (SD=4.54). The results indicated a statistically significant association (X2=11.5; gl=2; p=0.003) between poverty level and development score through the Denver II, as it can be observed in Table 1.

Table 1 – Association between the Denver II test and the level of family poverty

		Final Total Score		Total	Test	*p*-value
		Normal	Suspect			
Poverty Level	≤41 points	11	76	87	11.5	0.003
		12.6%	87.4%	100,0%		
	42-47 points	27	105	132		
		20.5%	79.5%	100.0%		
	≥48 points	33	67	100		
		33.0%	67.0%	100.0%		

From the cluster analysis, the participants were allocated in three groups. Table 2 illustrates the grouping from the discriminant analysis. Figure 1, in its turn, shows the discrimination of the three groups, highlighting the centroids of each of them: Group 1 in blue, Group 2 in green and Group 3 in red. In this way, the groups were organized in a way that their members crowded together.

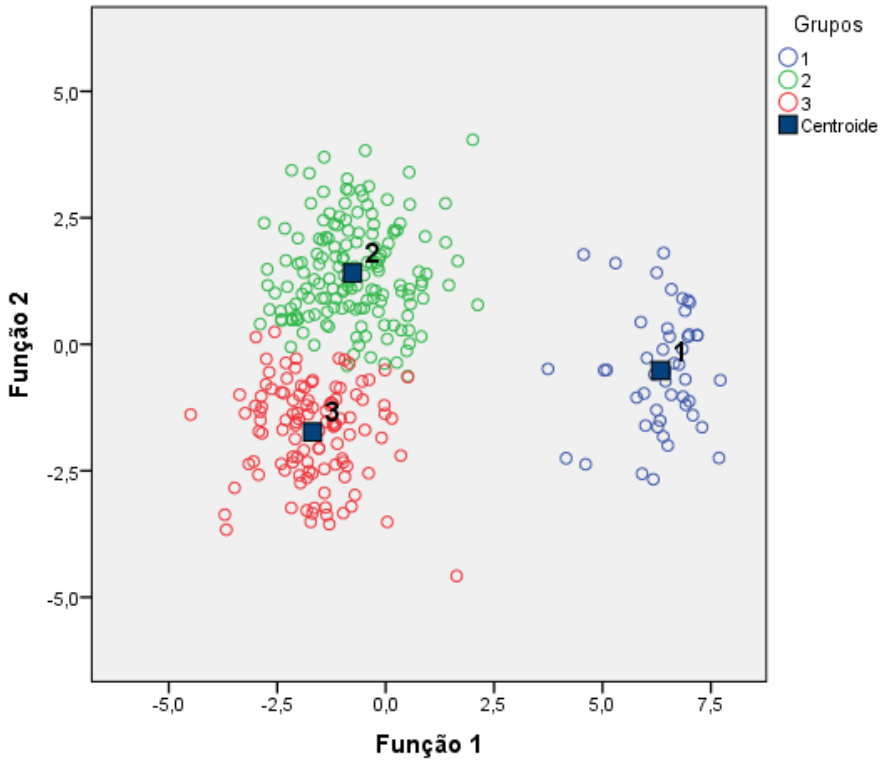

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Figure 1 – Discriminant map showing the grouping of the three clusters

From Table 2, it is observed that the main variables discussed in this study are distributed as follows: Group 1 is formed by a majority of male children (57.1%), with families belonging to the intermediate level of poverty (58.8%), living in the continental region (84.7%), with their home was main playing space (54.5%). This was the second largest group with preference for the two types of games (40.9%). Although it had a suspected delay according to Denver II (72.4%), among the groups, it was the one that had more children with normal development (27.6%).

Table 2 – Cluster distribution

		Group					
Variables	**Categories**	**1**		**2**		**3**	
Gender	Male	97	57.1%	71	55.9%	10	45.5%
	Female	73	42.9%	56	44.1%	12	54.5%
Denver II	Normal	47	27.6%	21	16.5%	3	13.6%
	Suspect	123	72.4%	106	83.5%	19	86.4%
District	Continental	144	84.7%	110	86.6%	16	72.7%
	Insular	26	15.3%	17	13.4%	6	27.3%
Poverty level	≤41 points	0	0.0%	62	48.8%	22	100.0%
	42-47 points	170	100%	65	51.2%	0	0.0%
	≥48 points	100	58.8%	0	0.0%	0	0.0%
Playing space	Home	93	54.5%	56	44.1%	6	25.9%
	Peridomicile	31	18.2%	36	28.3%	10	48.2%
	Collective Spaces	46	27.3%	35	27.6%	6	25.9%
Type of game	Motor	23	13.6%	36	28.3%	13	54.7%
	Symbolic	77	45.5%	34	26.8%	7	32.4%
	Motor/Symbolic	70	40.9%	57	44.9%	3	12.9%

In Group 2, most children are male (55.9%), with families belonging to the intermediate poverty level (51.2%), living in the continental region (86.6%), with their homes as playing space (44.1%). This was the largest group with preference for the two types of games (44.9%). It is suspected of delay by the Denver II (83.5%).

Finally, in Group 3, most children are male (54.5%), with families belonging to the bottom poverty level (100%), from the continental region (72.7%), but with a greater percentage of children living in the insular region (27.3%), having the peridomicile as main playing space (48.2%). This is the largest group with preference for motor games (54.7%). In addition, it is suspected of delay by the Denver II, showing the highest percentage (86.4%).

The association between low SEL and its consequences to child development is established in scientific literature[4,20,21]. When compared to their peers with better socioeconomic conditions, children in poverty situations experience disadvantages that involve several contexts, such as family, school and the community to which they belong[20-23,25]. When discussing the relation between environment and development, many studies have considered the quality of the family environment as a variable that involves multiple risk factors, among which family poverty stands out[20]. The findings of these researches indicate that the delay in NPMD occurs with greater frequency and severity when children remain in situations of extreme poverty during a long period, even when adults[24,25].

Regarding the types of games, children from the poorest families (bottom quartile) preferred motor games (42.6%), more than the children from other quartiles. Moreover, they showed a lower tendency to perform symbolic or symbolic/motor games (Table 3). It should be noted that this variable showed a statistically significant association with the level of family poverty (χ^2=9.02; *gl*=2; *p*=0.01). Thus, it is considered that the poorer the family, the less diversified and/or symbolic the children's play. For this analysis, the quartiles that represent the poorest families were added.

Table 3 – Association between the type of game and the level of family poverty

Type of Game	Poverty Level		*p*-value
	Bottom quartile	Other quartiles	
Motor	42.6%(26)*	57.4% (35)	
Symbolic	24.5% (24)*	75.5% (74)	0.01**
Motor and Symbolic	23.1% (37)	76.9% (123)	

Note: *adjusted residues>2; *Chi-Square* Test (p<0.05**).
Source: research data

Similar data were identified and showed the influence of the cultural and socioeconomic context on the choice of type of game, verifying prevalence of motor activities with turbulent character and physical contingency[4,6,14,16,23]. Thus, the properties of playing in each culture may vary depending on the SEL. Although parents with unfavorable conditions wish that their children have ludic quality and opportunities for that, this issue is not always a priority[8]. In addition to type, several variables are influenced in this relation, such as the content and diversity of the games, use of time and space, willingness to interact with their peers and environment, quantity of objects, gender issues, and time of interaction between parents and children[4,5,8,9,11,22].

Also, so that the child can engage in more diversified and structurally more complex games, such as make-believe, it is necessary to encourage their cognitive development[9,10,28]. However, most participants of this study were suspected of delay in language, which encompasses aspects of mental functions. According to Nwokah et al.[22], socioeconomic disparities are associated with differences in the brain structure, in areas linked to cognition. In this way, it is assumed that the children in the research tend to be less involved in symbolic games, which reduces the chances of stimulating important cognitive and social skills, limiting the possible gains of this ludic activity.

These findings are consonant with the researches by Smith[3] and also Smith and Dosdsworth[12], which point out that middle-class children are more involved in make-believe games with great elaborations, while the poorer ones would rather play with objects. The authors also related the low SEL to delays in the appearance of symbolic games. In those terms, children with less resources can be benefited by being in environments that stimulate playing, such as the school space[4,9,22]. These data also support the assumptions of the bioecological model[2], highlighting the mutual interaction with objects and symbols existing in the immediate environment, such as the day care or preschool.

Regarding the characteristics of the geographic contexts (insular and continental), children living in the islands tend to play more in the peridomicile and in public spaces (woods, parks, squares, playgrounds) than the ones from the mainland, who played more at home. The variables of playing spaces showed significant association with the geographic context (χ^2=11; gl=2; p=0.004), as shown in Table 4. These data are consistent with other studies performed in traditional communities of the North and Northeast regions of the country[6,7,17,23], which indicate that the peridomicile is the most used location in ludic practices, including natural spaces such as forests, rivers and creeks, woods next to their homes and the street, in addition to being the environment of greater coexistence among the neighborhood.

Table 4 – Association between playing space and the geographic context of the municipality

Playing Space	Context		*p*-value
	Continental	Insular	
Home environment	86.7% (130)*	13.3% (20)	
Peridomicile	70.2% (59)	29.8% (25)*	0.004**
Public Spaces	85.9% (73)	14.1% (12)	

Note: *adjusted residues>2; Chi-Square Test (p<0.05**).
Source: research data

It is observed that child games in the insular region are different from the continental one. Playing outdoors, which is more frequent in the islands, indicates a contextual characteristic favorable to the NPMD, especially for stimulating autonomy and social and physical skills. However, there was a reduction of the outdoor living spaces of children who live in the continental region. The increase in the rates of violence in neighborhoods and the disorganization of the urban space can limit the opportunities of playing out of home. Therefore, children that live in these contexts many times are kept at home for their own safety and tend to use the available toys and domestic objects[15].

Thus, the difficulty of accessing and enjoying urban spaces for ludic activities becomes not only a problem regarding these spaces, but also a risk factor for child development[29]. Trawick-Smith[11] and also Luz and Kuhnen[14] suggest that a physical space of quality, as well as the diversity of toys and materials for ludic activities, may contribute to the elaboration of more varied games, working as a factor of protection to development and allowing the training of social, physical, cognitive and psychological skills. Moreover, the quality of the space favors the maintenance of time in the same activity and interaction, promoting child socialization. It is considered that an environment with varied toys appropriate to the child's age stimulates the NPMD.

CONCLUSION

This study sought to understand the association between poverty, the NPMD and children's games in the municipality of Belém. Resuming the guiding hypothesis and questions, it was verified that the participants show a high delay suspicion in the NPMD, and family poverty is a predictor variable for this outcome in the studied geographic contexts. Regarding the types of games and the environment used for these activities, the results showed that poorer children developed less diversified games, although the types of ludic activities reflect the characteristics of the context where they lived.

As for the limitations of the study, we highlight the homogeneity of the sample. The children and families who participated in the study had similar socioeconomic characteristics, with a high level of family poverty. Although specific and standardized instruments were not used to investigate the games in the surveyed contexts, it was possible to add information on the types of games and the playing spaces in two contrasting contexts, continental and insular. It is also worth mentioning that this study sought to highlight the importance of child games and their role in, for example, learning and language acquisition, which allows a more accurate and global view on the ecology of child development in different regions of the Amazon forest, a context to this day little studied for this purpose. Researches of this nature and the discussion they generate are paramount for scientific innovations capable of promoting public policies focused on education and public health in early childhood education institutions in the municipality of Belém.

Note: All authors participated in all stages of the elaboration of this study.

REFERENCES

1. Hassano AYS, Araujo APQF, Jesus PB, Wajnsztajn S. Desenvolvimento neuropsicomotor. In: Azevedo CES. Bases da pediatria. Rio de Janeiro: Rubio; 2013. p.29-34.

2. Bronfenbrenner U. Bioecologia do desenvolvimento humano: tornando os seres humanos mais humanos. Porto Alegre: Artmed; 2011.

3. Smith PK. Children and play: understanding children's worlds. Oxford: Wiley-Blackwell; 2009.

4. Poletto RC. A ludicidade da criança e sua relação com o contexto familiar. Psicol Estud (Campinas). 2005;10(1):67-75. doi: 10.1590/S1413-73722005000100009.

5. Marques RL, Bichara ID. Em cada lugar um brincar: reflexão evolucionista sobre universalidade e diversidade. Estud Psicol (Campinas). 2011;28(3):381-8. doi: 10.1590/S0103-166X2011000300010.

6. Reis DC, Monteiro EF, Pontes FAR, Silva SSC. Brincadeiras em uma comunidade ribeirinha amazônica. Psicol Teor Prat. 2012;14(3):48-61. doi: 10.9788/TP2014.4-06.

7. Santos GM, Almeida NM, Profice CC. As brincadeiras entre crianças tupinambá de Olivença: tradições passadas por gerações. Zero-a-Seis. 2014;16(30):259-74. doi: 10.5007/1980-4512.2014n30p59.

8. Santos AK. Um estudo sobre esta relação em dois povoados do agreste sergipano [dissertação]. Salvador (BA): Universidade Federal da Bahia; 2005. Disponível em: https://pospsi.ufba.br/sites/pospsi.ufba.br/files/ana_karina_santos.pdf.

9. Santos AK, Dias AM. Comportamentos lúdicos entre crianças do nordeste do Brasil: categorização de brincadeiras.

Psicol Teor Pesq. 2010;26(4):585-94. doi: 10.1590/S0102-37722010000400002.

10. Marcolino S, Mello AS. Temas das brincadeiras de papéis na educação infantil. Psicol Ciên Prof. 2015;35(2):457-72. http://dx.doi.org/10.1590/1982-370302432013.

11. Trawick-Smith J, Wolff J, Koschel M, Marley J. Effects of Toys on the Play Quality of Preschool Children: Influence of Gender, Ethnicity, and Socioeconomic Status. Early Childhood Educ J. 2015;43(4):249-56. doi: 10.1590/1982-370302432013.

12. Smith PK, Dodsworth C. Social class differences in the fantasy play of preschool children. J Genet Psychol. 1978;133:183-90. doi: 10.1080/00221325.1978.10533376.

13. Cotrim GS, Bichara ID. O brincar no ambiente urbano: limites e possibilidades em ruas e parquinhos de uma metrópole. Psicol Reflex Crit. 2013;26(2):388-95. doi: 10.1590/S0102-79722013000200019.

14. Luz GM, Kuhnen A. O uso dos espaços urbanos pelas crianças: explorando o comportamento do brincar em praças públicas. Psicol Reflex Crit. 2013;26(3):552-60. doi: 10.1590/S0102-79722013000300015.

15. Kimbro RT, Schachter A. Neighborhood poverty and maternal fears of children's outdoor play. Fam Relat. 2012;60(4):461-75. doi: 10.1111/j.1741-3729.2011.00660.x.

16. Pérez BC, Jardim MD. Os lugares da infância na favela: da brincadeira à participação. Psicol Soc. 2015;27(3):494-504. doi: 10.1590/1807-03102015v27n3p494.

17. Teixeira SRS, Alves JM. O contexto das brincadeiras das crianças ribeirinhas da Ilha do Combu. Psicol Reflex Crit. 2008;21(3):374-82. doi: 10.1590/S0102-79722008000300005.

18. Costa MA, Tsukumo ILT, organizadores. 40 anos de regiões metropolitanas no Brasil. Brasília: IPEA; 2013.

19. Torquato JA, Paes JB, Bento MC, Saikai GMPN, Souto JN, Lima EAM, Abreu LC. Prevalência de atraso do desenvolvimento neuropsicomotor em pré-escolares. Rev Bras Cresc Des Hum. 2011;21(2):259-68. doi: 10.7322/jhgd.20014.

20. Evans GW, Li D, Whipple SS. Cumulative risk and child development. Psychol Bull. 2013;139(6):1342-96. doi: 10.1037/a0031808.

21. Brito CML, Vieira GO, Costa MCO, Oliveira NF. Desenvolvimento neuropsicomotor: o teste de Denver na triagem dos atrasos cognitivos e neuromotores de pré-escolares. Cad Saúde Pública. 2011;27(7):1403-14. doi: 1590/S0102-311X2011000700015.

22. Nwokah E, Hsu H, Gulker H. The use of play materials in early intervention the dilemma of poverty. Am J Play. 2013;5(2):187-18.

23. Reis DC, Borges JAR, Silva SSC, Mendes LSA, Pontes FAR. Um estudo descritivo das brincadeiras em uma comunidade Ribeirinha Amazônica. Temas Psicol. 2014;22(4):745-58. doi: 10.9788/TP2014.4-06.

24. Frankenburg WK, Dodds J, Archer P, Shapiro H, Bresnick B. The Denver II: a major revision and restandardization of the Denver Developmental Screening Test. Pediatrics. 1992;89:91-7. doi: 10.4172/2165-7890.1000192.

25. Issler RMS, Giugliani ERJ. Identificação de grupos mais vulneráveis à desnutrição infantil pela medição do nível de pobreza. J Pediatr (Rio J.). 1997;73(2):101-5. doi: 10.1590/S0102-311X2007001000009.

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