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Original Article

Occupational therapy activities developed with children and pre-teens with Down syndrome[1]

Atividades terapêuticas ocupacionais desenvolvidas com crianças e pré-adolescentes com síndrome de Down

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Abstract

The objective of this work is to describe the activities used in a therapeutic toy library with groups of children and pre-teens with Down syndrome and to correlate them with the age group. For that, an analytical study of 297 activities developed with 44 participants with Down syndrome from 2 to 13 years old was performed, based on the analysis of the Activity Record Sheet. To meet the first objective, a descriptive univariate analysis was performed, using absolute and relative frequencies for the categorical variables. In order to answer the second objective, which compared the categorical variables related to the activities developed in the toy library with the age groups, a bivariate analysis was performed using the chi-square test (X^2). The results showed that a varied set of activities was used, especially those involving music, stacking, fitting and building games for the 2 to 3 years old and 11 months old group; expressive activities for the 4 to 7 years old and 11 months old group; and games, math activities, reading, writing, and activities related to language development for the 8 to 13 years old group. The study brought relevant data to the development of Occupational Therapy in the childhood area, especially in working with children with intellectual disabilities.

Keywords: Occupational Therapy, Down Syndrome, Games and Toys.

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Resumo

O objetivo deste trabalho é descrever as atividades utilizadas em uma brinquedoteca terapêutica com grupos de crianças e pré-adolescentes com síndrome de Down e correlacioná-las com a faixa etária. Para tanto, foi realizado um estudo analítico de 297 atividades desenvolvidas com 44 participantes com síndrome de Down de 2 a 13 anos, com base na análise da Ficha de Registro de Atividades. Para atender ao primeiro objetivo, foi feita a análise univariada descritiva, utilizando-se frequências absolutas e relativas para as variáveis categóricas. A fim de responder ao segundo objetivo, que comparou as variáveis categóricas relacionadas às atividades desenvolvidas na brinquedoteca com as faixas etárias, foi feita a análise bivariada, empregando-se o teste qui-quadrado (X^2). Os resultados mostraram que foi utilizado um conjunto variado de atividades, em especial aquelas envolvendo música, brincadeiras de empilhar, encaixar e construir para o grupo de 2 a 3 anos e 11 meses; atividades expressivas para o grupo de 4 a 7 anos e 11 meses; e jogos, atividades de matemática, leitura, escrita, e aquelas relacionadas ao desenvolvimento de linguagem para o grupo de 8 a 13 anos. O estudo trouxe dados relevantes para o desenvolvimento da terapia ocupacional na área da infância, em especial no trabalho com crianças com deficiência intelectual.

Palavras-chave: Terapia Ocupacional, Síndrome de Down, Jogos e Brinquedos.

1 Introduction

Playing is fundamental for child development and is the main occupation of the child. By the act of playing, the child explores the environment, acquires new skills, builds concepts, understands affective relationships and appropriates cultural values. Pre-teens are also interested in games such as board games, video games and card games (Pereira, 2000).

Playful activities allow experimentation, it is motivated by pleasure and discoveries, involve the mastery of reality, creativity and expression (Ferland, 2006). Playing allows the child to develop their adaptation and interaction skills, enabling to transfer them to the different situations experienced in their daily lives (Hagedorn, 2003).

Playing in occupational therapy is an end and an object of intervention, but also as a means for acquiring and improving skills (Ferland, 2006).

The occupational therapist actions promote the participation and involvement of people in the daily activities that are necessary and/or produce satisfaction. In the area of childhood, activities of daily living, school and playing are vital fields for the social participation of the child (Brandão, 2006; American Occupational Therapy Association, 2014).

Working with children with Down syndrome, the occupational therapist seeks to develop different skills based on the use of the activity as a therapeutic resource. They work their motor, cognitive, sensory, perceptual aspects and the ability to interact and participate in activities of daily living based on the environment organization and their difficulties level, starting from the easiest activities the most complex (Pôrto & Ibiapina, 2010).

This is because children with Down syndrome are delayed in their intellectual development to some degree, expressed by significant limitations in their cognitive area and adaptive behavior, which are necessary for the acquisition of concepts, to perform practical activities and social interaction; physical aspects and clinical complications also influence the development of their motor and communication skills (Brasil, 2013).

The toy library is one of the places where occupational therapy can take place, a ludic space, attractive, safe and with a variety of toys (Vanderlinde et al., 2011). A space of citizen formation, in which it is possible to stimulate taking care of the environment and the different materials, learning to share toys and acquire notions of democracy and social rights (Bernardes et al., 2014).

Playing is more than a tool to stimulate children and pre-teens, it is essential to enhance their development. Through playing, they interact with the environment, develop skills by observing, imitating and creating alone or with their peers, thus expanding their thoughts, language and autonomy.

When the focus of the intervention are children with Down syndrome, playing needs to be facilitated, the instruments modified and the physical space considered, so that playful activity is highlighted as essential for their development and learning. The occupational therapist contributes to expand the participation of children who need support, through adapting resources and strategies that offer opportunities for experimentation, learning and interaction during playing (Pelosi, 2009).

The occupational therapist interventions are based on different objectives and strategies with children with Down syndrome. Occupational therapy may take place in a home orientation program (Wuang et al., 2013), or in individual appointments (Wuang et al., 2011; Silva & Pelosi, 2018), or in a group, with the aim of favoring occupational performance or a specific ability (Hekal et al., 2017).

The home occupational therapy program developed by Wuang et al. (2013), with 57 children with Down syndrome, showed a statistically significant evolution in occupational performance, fine motor skills, such as writing, drawing and manipulate objects, and the participation of activities.

Silva & Pelosi (2018, p. 59) described the case of a 2 years and 5 months old child with Down syndrome based on the analysis of Playful Behavior and their family's perception after 18 months of intervention. The study reported the use of games "with different textures and color materials", and participation in activities that allowed auditory and vestibular stimulation, mentioning as favorite toys of the child "those that produced sound, balls and puppets".

Studies such as Wuang et al. (2011) showed that the intervention using Wii virtual reality platform games increased the motor, visomotor and sensory integration skills of 105 children with Down syndrome, pointing to the use of this activity as an aid in the rehabilitation process.

The objective of the occupational therapy may be the development of specific skills. Study such as Hekal et al. (2017) showed the evolution of children with Down syndrome after training motor skills with buttoning activities, using the spoon, pouring water into a pot, transferring cubes and sponges with their hands and with the help of tweezers, among others.

The occupational therapist working with children with Down syndrome may focus on the development of more independence in activities of daily living. In many of these studies, the Pediatric Evaluation of Disability Inventory – Pedi is used. Studies such as Mancini (2005) and Pazin & Martins (2007) indicated lower performance scores compared to typical children, especially in the areas of self-care and social function although the motor area was less out dated over the years. Dolva et al. (2007) found more impairment involving fine motor skills for activities such as handling clothes and cutlery in children with Down syndrome at age 5. Martins et al. (2013) in the studied group of 17 children aged 5 to 7 years and 6 months old, found a smaller repertoire of self-care skills, compared to the control group.

Despite the knowledge of occupational therapy possibilities with children with Down syndrome, scientific publications describing the activities developed by those professionals with that population are still incipient (Lourenço & Cid, 2010; Silva et al., 2013; Bernardes et al., 2014).

In this sense, the objective of this work was to describe the activities used in occupational therapy sessions in a therapeutic toy library with groups of children and pre-teens with Down syndrome, and correlate them according to their age.

2 Method

An observational, analytical and ambidirectional study with a quantitative approach that analyzed activities developed in occupational therapy sessions of 44 children and pre-teens with Down syndrome from 2 to 13 years old, treated in group in a therapeutic toy library by a team of five occupational therapists. The study period was 18 months, from August 2014 to December 2015. The study was approved by the Research Ethics Committee with *Caae* number 45602715.6.0000.5264.

The groups were structured with up to five people, organized by age group, namely: 2 to 3 years and 11 months old; 4 to 5 years and 11 months old; 6 to 7 years and 11 months old; and 8 to 13 years old. To facilitate the understanding of the activities applied in different age groups, analyses were performed considering the occupational therapeutic objectives determined for those groups. Thus, three groups were established: children aged between 2 and 3 years and 11 months old (n = 77), children aged 4 to 7 years and 11 months old (n = 71) and children aged 8 to 10 years old and pre-teens aged 10 to 13 years old (n = 149), which corresponded, respectively, to 25.9%, 24.0% and 50.1% of the activities carried out in the toy library.

The interventions lasted 90 minutes with activities organized in order to introduce children to games and toys based on the repertoire of each group. Later, they developed graphing activities related to the main activity of the session while families receive guidelines on how to stimulate their children at home. At the end of the sessions, they had 15 to 30 minutes for free play in the toy library. Each group was accompanied by an occupational therapist and two to three interns in the area.

2.1 Data collection

For data collection, the researchers elaborated an Activity Record Sheet based on their experiences and in scientific literature of the field. After specifying the items of the instrument, a pilot test was performed in some activities, in order to evaluate whether all items had been contemplated.

The Activity Record Sheet made it possible to characterize the activities developed in the toy library, graphing activities during the session and those carried out at home, and families' guidelines. This article only presents data related to the activities developed in the toy library, without considering graphing activities and families' guidelines. The description of graphing activities is available in another article (Borges et al., 2017).

The Sheet was elaborated to describe the activities used and has dichotomous items with predominantly yes and no responses; for example, using adapted games – yes or no. The characterization of the activity considered the group to which it belonged, the codes of the children who participated and the number of activities performed in the session.

1) Specificity of each activity - activity performed (adapted game; story book; no adapted game; role-playing; cause and effect game; music games; games for the development of fine motor skills, as cutting, fitting, stacking; arts games, such as painting, drawing, playdough and collage; other activity); objective (mathematics; reading; writing; fine motor coordination; language stimulus; alternative and expanded communication development – AEC; other objects);
2) Materials used in the activities – which material (concrete object; miniature; photos; symbols; words; tablet and computer); supporting material; if so, which supporting material (inclined plane; non-slip; tray or other container; adaptations and other supporting materials); any AEC resource; if so, which AEC resource (communication board; communicator with 6 options; communicator with 12 options; iPad with GoTalkNow; tablet with Vox4all; computer with power point and computer with Speaking Dynamically); access form (direct and scanning);
3) Activity gaps – something was missing during the activity; if so, what's missing (miniature; objects; symbols; board; support material; driver; adapted mouse; sound; iPad app or tablet app); some material was broken;
4) Description of the activity – how was the proposed activity (facilitated participation; stimulated individual participation; it achieved the desired objective; all managed to participate within their possibilities); who could not participate, what was the reason (aggressiveness; excitement; did not understand the activity; activity was above the possibilities and another reason); activity was appropriate to the age of the group; the activity was appropriate to the level of development of the group; activity achieved objectives other than those proposed.

The sheet was answered by five occupational therapists, experienced in working with children and pre-teens with Down syndrome, who participated in their elaboration and

who attended the therapeutic toy library where data collection was carried out. It was filled in immediately after each session, with the support of the trainees.

2.2 Data analysis

The data was organized in the Microsoft Excel program, and typed by two researchers, who reviewed the original sheets when there was inconsistency between the two spreadsheets. The sheets were analyzed with the aid of the Statistical Package for The Social Sciences - SPSS software, version 19.0.

To meet the first objective, descriptive univariate analysis was performed, using absolute and relative frequencies for categorical variables. The chi-square test was applied to test the independence of bivariate relationships — variables describing the activities developed in the toy library versus subgroups by age groups (2 to 3 years and 11 months old, 4 to 7 years and 11 months old, 8 to 13 years old). This study considered the 95% confidence interval and significance level of $p < 0.05$.

3 Results

3.1 Descriptive analysis of activities in occupational therapy groups performed in the toy library

Over 18 months, the 11 groups attending occupational therapy in the therapeutic toy library performed 297 activities, using games, books, roleplaying, music, fitting, stacking, building activities, or activities with resources such as playdough and ink.

Most professionals chose to develop only one activity in the session (75.8%), and 24.2% performed two activities.

On the resources used, the evaluator was able to check more than one option, because an activity can be composed of several elements. The resource most frequently used, was board games, including in this modality adapted games and not adapted games – Table 1.

Table 1. Resources used during occupational therapy activities developed with children and pre-teens with Down syndrome.

Resources	%
Adapted board games	21.5
Not adapted board games	15.8
Cause and effect toys	25.9
Dynamic activities (ball games, bowling, playing with the body, space and toy exploration)	25.9
Constructive activities (stacking, fitting and building toys)	18.9
Activities with music (sound toys such as piano, rattle, mobile apps or songs sung by the therapist)	16.5
Roleplaying games (house, dolls, gas station, cars, farm, animals)	13.1
Expressive activities	10.8
Stories	3.4%

The activities could be checked with more than one objective, and the most frequent were language stimulation, concept development and fine motor coordination, as can be seen in Table 2.

Table 2. Objective of occupational therapy activities developed with children and pre-teens with Down syndrome.

Objectives	%
Language stimulation	73.1
Development of concepts	68.1
Development of fine motor coordination	66.0
Development of social skills (interaction, rules understanding, knowing how to wait turns to play, and share toys)	36.7
Development of reasoning, attention, concentration and association of concepts	12.2
Visual, auditory and visomotor stimulation	11.7
Development of broad motor coordination	8.2
Recognition of objects and understanding their function	8.9

Regarding the development of concepts, learning mathematics such greatness, space and numerical notions (25.2%); colors, body scheme (20.0%), reading (17.2%); and writing (5.7%) were mentioned.

Table 3 describes the materials involved in the therapeutic sessions, and the concrete objects were the most used. More than one item could be checked in this topic, since different materials can be used in the same activity.

Table 3. Materials used in occupational therapy sessions with children and pre-teens with Down syndrome.

Materials used	%
Concrete objects	67.0
Miniatures	29.6
Symbols (photographs, drawings and pictograms)	20.9
Words, syllables and letters	12.8
Tablet	12.8
Computer	3.0

Regarding the use of support material, only 10.1% of the professionals indicated they needed them. Of this group, the most frequently used were adaptations (36.7%); inclined plane (13.3%); non-slip mat (10.0%); and tray (3.3%).

Alternative Communication resources were used in only 12 activities (4.0%). These resources consisted on the printed communication board; and iPad with Go Talk Now app.

To understand the need to complement the materials available in the toy library, the professional was asked whether they needed any material for carrying out the activities. Only in 22 of the activities (7.4%) the need for some unavailable material was checked,

and they mentioned objects such as dolls and animal (31.2%); sound equipment (27.3%); support material such as inclined plane or tray (18.2%); communication board (13.6%); symbols (4.5%); driver (4.5%); and tablet app (4.5%).

Table 4 shows the description of the activities developed by the professionals. The activities proved to be facilitators of individual and group participation, appropriate to the possibilities of the participants and objectives.

Table 4. Description of the activities developed by occupational therapists with children and pre-teens with Down syndrome.

Description of the activities	%
Age-appropriate	97.3
Facilitate individual participation	96.3
Facilitate group participation	95.3
Appropriate to the possibilities of the participants	92.6
Appropriate to the objectives	91.6

Non-participation was mainly because there were moments of excitement (28.6%); non-understanding of the activity, because it was above the child's possibility (23.8%); and aggressiveness (9.5%).

3.2 Activities developed in the toy library by age group

To meet the second objective, we compared the categorical variables related to the activities developed in the toy library by age groups of 2 to 3 years and 11 months old, which corresponded to 26.2% of the activities analyzed; 4 to 7 years and 11 months old (21.8%) and 8 to 13 years old (52%).

Table 5 shows the variables related to the activities developed in the toy library, according to the age group of the children. The table presents the first activity chosen by the occupational therapist to start the session, and the second activity performed on that day.

In general, it was found that, for the group of 2 to 3 years and 11 months old, activities involving music such as the first activity of the session ($p < 0.001$) and stacking, fitting and building activities as the first activity of the day ($p = 0.002$), as the second activity of the session ($p = 0.020$) had statistical significance. For the group from 4 to 7 years and 11 months old, expressive activities, such as the second activity of the day, were significant ($p = 0.013$). For the group from 8 to 13 years old, the activities with statistical significance comprised the use of adapted games ($p < 0.001$), not adapted games ($p = 0.002$) and math activities ($p < 0.001$), reading ($p < 0.001$), writing ($p = 0.006$) and language development ($p = 0.001$), all as first activity of the day.

Table 5. Frequencies of variables related to activities developed in the toy library by age group. Rio de Janeiro – RJ.

Variables	2 to 3 years and 11 months old	4 to 7 years and 11 months old	8 to 13 years old	*p**	2 to 3 years and 11 months old	4 to 7 years and 11 months old	8 to 13 years old	*p**
	Activity 1				Activity 2			
Cause and effect								
Yes	11 (36.7)	7 (23.3)	12 (40)	0.296	3 (42,9)	0 (0)	4 (57.1)	0.162
No	48 (24.6)	42 (21.5)	105(53.8)		15 (23.1)	22 (33.8)	28 (43.1)	
Music								
Yes	16 (59.3)	5 (18.5)	6 (22.2)	**<0.001**	2 (15.4)	6 (46.2)	5 (38.5)	0.372
No	43 (21.7)	44 (22.2)	111(56.1)		16 (27.1)	16 (27.1)	27 (45.8)	
Expressive								
Yes	0 (0)	4 (30.8)	9 (69.2)	0.086	0 (0)	5 (83.3)	1 (16.7)	**0.013**
No	59 (27.8)	45 (21.2)	108(50.9)		18 (27.3)	17 (25.8)	31 (47)	
Story books								
Yes	2 (40)	1 (20)	2 (40)	0.771	0 (0)	1 (100)	0 (0)	0.316
No	57 (25.9)	48 (21.8)	115(52.3)		18 (25.4)	21 (29.6)	32 (45.1)	
Roleplaying								
Yes	5 (55.6)	1 (11.1)	3 (33.3)	0.123	1 (16.7)	1 (16.7)	4 (66.7)	0.516
No	54 (25)	48 (22.2)	114(52.8)		17 (25.8)	21 (31.8)	28 (42.4)	
Fine motor								
Yes	13 (56.5)	3 (13)	7 (30.4)	**0.002**	6 (60)	1 (10)	3 (30)	**0.020**
No	46 (22.8)	46 (22.8)	110 (54.5)		12 (19.4)	21 (33.9)	29 (46.8)	
Adapted game								
Yes	0 (0)	11 (21.6)	40 (78.4)	**<0.001**	0 (0)	3 (50)	3 (50)	0.288
No	59 (33.9)	38 (21.8)	77 (44.3)		18 (27.3)	19 (28.8)	29 (43.9)	
Not adapted game								
Yes	2 (5.4)	7 (18.9)	28 (75.7)	**0.002**	1 (25)	0 (0)	3 (75)	0.336
No	57 (30.3)	42 (22.3)	89 (47.3)		17 (25)	22 (32.4)	29 (42.6)	
Math								
Yes	0 (0)	12 (26.1)	34 (73.9)	**<0.001**	1 (12.5)	3 (37.5)	4 (50)	0.681
No	59 (33)	37 (20.7)	83 (46.4)		17 (26.6)	19 (29.7)	28 (43.8)	
Reading								
Yes	0 (0)	5 (11.9)	37 (88,1)	**<0.001**	0 (0)	0 (0)	3 (100)	0.141
No	59 (32.2)	49 (21.8)	117 (52)		18 (26.1)	22 (31.9)	29 (42)	
Writing								
Yes	0 (0)	1 (7.1)	13 (92.9)	**0.006**	0 (0)	0 (0)	1 (100)	0.531
No	59 (28)	48 (22.7)	117 (52)		18 (25.4)	22 (31)	31 (43.7)	
Graphing								
Yes	33 (26.2)	22 (17.5)	71 (56.3)	0.174	12 (34.3)	10 (28.6)	13 (37.1)	0.197
No	26 (26.3)	27 (27.3)	46 (46.5)		6 (16.2)	12 (32.4)	19 (51.4)	
Language								
Yes	27 (18.2)	35 (23.6)	86 (58.1)	**0.001**	12 (31.6)	10(26.3)	16 (42.1)	0.374
No	32 (41.6)	14 (18.2)	31 (40.3)		6 (17.6)	12 (35.3)	32 (44.4)	

* $p > 0.05$.

4 Discussion

The objective of occupational therapy treatments performed in the therapeutic toy library was to provide the experimentation of games, toys and playing that stimulate development and contribute to adaptations that favored the of children and pre-teens with Down syndrome participation and their families. The premise is the fundamental role of occupational therapy in the development of motor, cognitive, sensory, perceptual aspects, social interaction and the stimulation of autonomy and independence in basic and instrumental activities of daily living, using playing as a therapeutic resource (Pôrto & Ibiapina, 2010).

A study conducted in a hospital in Mumbai showed that children evaluated by the Knox Preschool Playful Scale before and after being treated at the occupational therapy service for one month, had significant improvement in their playful behavior, with significant statistical results (Solanki et al., 2014).

In the current study, 297 activities were developed in occupational therapy sessions, carried out over 18 months, using games, books, symbolic toys, such as little house, dolls, gas station, cars, farm, animals, activities with music, cause and effect toys, fitting, stacking, building games and expressive activities using resources such as playdough and painting, as well as dynamic activities such as ball games, bowling, body games and exploration of the space, which shows a set of well-diversified activities.

Similar data were found in the experience report of Bernardes et al. (2014), in a toy library of an outpatient clinic in Ribeirão Preto, where children and teenagers aged 2 to 15 years old were treated for one year, and the activities were also shown to be quite varied. They recorded activities such as

> […] painting with paint or crayons; video game; competitive board or card games; memory set; puzzles; dolls; cooking and little house miniatures; cars; pick up sticks; playdough; making toys; comics; building blocks; tool cases; and computer (Bernardes et al., 2014, p. 589).

The analysis of activities by age group developed in the toy library showed data with statistical significance in activities with music and in stacking, fitting and building activities related to fine motor coordination development in the group from 2 to 3 years and 11 months old; in expressive activities in the group from 4 to 7 years and 11 months old; and in adapted and not adapted games, in activities of mathematics, reading, writing and language development in the group from 8 to 13 years old.

Regarding the analysis of the second activity of the day, it was verified that most of them was related to the development of graphing and language, without significant statistical data. In this sense, these data are coherent with the work in the toy library of the present research, in which graphing activities, in general, were used as a form of registration or systematization of the concept of work in the session.

Roleplaying and activities with stories appeared in the activities directed in a less expressive way, but the participants of all ages often chose them in the moments of free play in the toy library, which took place in the last 15 to 30 minutes of each 90 minutes session. They could play with dolls, little house, farm, gas station, buying and selling,

animals, cars, story books and their characters, as well as ball, bowling and fitting toys, with the supervision and stimulation of the occupational therapist and the interns.

The activities developed in the therapeutic toy library aimed at different possibilities according to the group's need. It is noteworthy that the same activity could contemplate one or more objectives. The stimulus to oral and written language during the activities was the objective most signaled by occupational therapists. This objective was taking into account through the incentive for choices, interaction between the participants of the group and with the therapist, with songs, stimulation of written language, among others.

Language is a fundamental ability to mediate social, school and learning skills, however, children with Down syndrome may have deficiency in reception and expression and require more stimulation in this area. A study that compared the expressive communicative and lexical performance of children with Down syndrome and children with typical development showed that the former presented lower results in the aspects of word and phrase production, narrative, time attention and naming figures (Lamônica & Ferreira-Vasques, 2015).

Regarding the development of concepts, they worked mathematics, body scheme, reading and writing. For reading and writing learning, auditory processing is fundamental, and this may be impaired in children with Down syndrome. A comparative study between children with Down syndrome and typical development showed that the main difficulty was in rhyme awareness, indicating that this population need to include include the awareness of phoneme, syllable and rhyme (Naess, 2016), corroborating the findings of this study.

Regarding mathematics, children and pre-teens with Down syndrome may present difficulties in problem solving and using the concepts learned in instrumental activities of daily living. The skills of perception, attention and concentration, reasoning, memory and generalization may be compromised, resulting in the difficulty of learning concepts and their use beyond the school task (Malaquias et al., 2013). The participants of this study presented difficulties in pre-arithmetic abilities, which are the basis for the acquisition of arithmetic and involve notions such as large/small, larger/smaller, first/last, discrimination of numerals from 1 to 10, objects quantities, conservation of discrete quantities, numeral-quantity and quantity-quantity equivalence (Carmo, 2012).

A study about the mathematical skills of ten children with typical development and 11 with Down syndrome, aged between 6 and 10 years old, showed that the latter presented poor performance when compared to children without disabilities, because they presented difficulties in attention, reasoning, and abstraction ability, essential for good school performance.

The activities of this study were described by occupational therapists as facilitators of group participation and individual participation; appropriate to achieve the desired objectives; and that allowed everyone to participate within their possibilities. Non-participation was mainly because there were moments in which the child was too excited; they did not understand the activity or there were situations of aggressiveness. In this sense, the data suggest that the activities were adequate to the age and level of development of the group. This adequacy can be justified by the expertise of the

occupational therapist in the area and in performing analysis of the activity according to the need of each group.

Considering this target population, the occupational therapist can help on their development with actions that focus on occupational performance, aiming at increasing functional capacity and creating opportunities for the performing self-care activities and those that allow interaction in different contexts (Silva et al., 2013).

Regarding their participation in group activities, in a study on the influence of cognitive functions on the participation of children with Down syndrome, Rihtman et al. (2010) indicate that it is necessary to invest in the activities carried out in groups to favor independence in adulthood.

Pôrto & Ibiapina (2010) also highlighted the diversification of resources for learning. They studied the development of body scheme in aquatic environment for children with Down syndrome and showed the use of recreational games and music during the activities carried out in the water.

5 Final considerations

The results of this study showed, in general, that a varied set of activities was used, especially those involving music and stacking, fitting and building for the group from 2 to 3 years and 11 months old; expressive activities for the group from 4 to 7 years and 11 months old; and games, math, reading, writing, and language development activities for the group from 8 to 13 years old.

The objectives involved motor, cognitive, sensory, social skills and language stimuli, which were achieved in activities described as facilitators of individual and group participation, appropriate to achieve the desired purposes, and that allowed everyone to participate within their possibilities.

Restricted case-by-case can be a limitation of the study and, therefore, it would be important to develop new research with similar methodology in more comprehensive populations. Another limitation of it is the fact that pre-teens were not studied separately.

Nevertheless, it is expected that the findings can foster debate about therapeutic activities developed with children and pre-teens with Down syndrome in the context of a toy library. In addition, they contributed to the strengthening of occupational therapists actions in this context.

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