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Original Article

Transcending the problem: perceptions of mothers and children about the impact of developmental coordination disorder in everyday life

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Abstract: Introduction: Most of the population can carry out daily activities with competence. The profile of some children who have difficulty doing typical activities of childhood is well documented in the literature. Children with developmental coordination disorder (DCD) demonstrate a marked effort in the development of motor skills, with possible repercussions on mental health. Objective: To investigate the perceptions of mothers and their children about the impacts caused by DCD on everyday life; to explore the relations between the occupations, skills, and the environment; to investigate potential influences of the disorder on children's self-concept and self-efficacy. Method: This is an exploratory cross-sectional study with a qualitative approach involving three mothers and three children. Data were analyzed using content analysis. Results: Three categories emerged: play and doing opportunities and impacts in school activities. Mothers perceived difficulties on occupational performance of their children, especially in school activities. Social context's characteristics are related to the offer of play opportunities for the children. The children understand that they have some difficulties, and one child identifies peer problems. Conclusion: This study can highlight the importance of the recognition of DCD and its co-occurrence with learning disability as a persistent problem that affects children's and their families' everyday life, and the role of environmental factors on the opportunities children have to play.

Keywords: *Motor Skill Disorders, Activities of Daily Living, Child, Mothers, Perception, Social Environment.*

Transcendendo o problema: percepções de mães e crianças sobre o impacto do transtorno do desenvolvimento da coordenação no dia a dia

Resumo: Introdução: A maior parte da população é capaz de executar movimentos e atividades cotidianas com relativa competência. É bem documentado na literatura o perfil de algumas crianças que têm muita dificuldade para realizar atividades consideradas típicas da infância. Crianças com transtorno do desenvolvimento da coordenação (TDC) demonstram prejuízo acentuado no desenvolvimento das habilidades motoras, com possíveis repercussões na saúde física e mental. Objetivo: Investigar as percepções da díade mãe-criança sobre os prováveis impactos do TDC no desempenho ocupacional das crianças e no dia a dia da família; explorar as relações existentes entre as ocupações, habilidades e ambiente; investigar a influência do transtorno no autoconceito e autoeficácia das crianças. Método: Trata-se de um estudo exploratório de corte transversal, de abordagem qualitativa que contou com a participação de 3 mães e 3 crianças. A análise dos dados foi feita por análise de conteúdo. Resultados: Duas categorias emergiram: oportunidades de brincar e de fazer e impactos na escola. As mães percebem as dificuldades relacionadas ao desempenho das ocupações das crianças, principalmente nas atividades escolares. Algumas questões

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do contexto social foram identificadas pelas mães como balizadoras das oportunidades de brincar de suas crianças. As crianças compreendem que têm algumas dificuldades e uma delas identifica problemas na relação com os colegas. Conclusão: Acredita-se que o estudo possa contribuir para reforçar a necessidade de reconhecimento do TDC e sua coocorrência com dificuldades de aprendizagem como um problema persistente e impactante no cotidiano de crianças e suas famílias, e a importância de fatores ambientais como mediadores da oferta de oportunidades de brincar das crianças.

Palavras-chave: *Transtornos das Habilidades Motoras, Atividades Cotidianas, Criança, Mães, Percepção, Meio Social.*

1 Introduction

Since the middle of the twentieth-century human development has been understood by many theorists as a multidimensional process (SPENCER; PERONE; BUSS, 2011). From the perspective of the contemporary theories, the child development has been studied from an ecological and dynamic perspective and, rather than characterizing what changes with the development, there is a tendency to understand how developmental changes occur (BRONFENBRENNER; CECI, 1994; THELEN, 1995; SPENCER; PERONE; BUSS, 2011). There is also a valorization in the relationships between the child development and the cultural traditions, practices, places and historical context in which children's activities are experienced (HEDEGAARD, 2012).

The care given to children is also influenced by cultural, socioeconomic, and family structure factors (FERREIRA et al., 2018; FREITAS et al., 2013). The development occurs from the interaction of relationships experienced in the individual's daily life mediated by culture and socio-historical context (NELSON; IWAMA, 2010; HEDEGAARD, 2012). Within these perspectives, Bronfenbrenner's ecological approach assists in understanding that the individual is in constant interaction with their relationships and social contexts, that is, genetic material does not produce finished traits, but interacts with environmental experience in determining the results of the development (BRONFENBRENNER; CECI, 1994). Bronfenbrenner (1979) characterizes the context as an event or condition outside the organism that can influence or be influenced by the developing person. The bio-ecological approach understands the context as influential potentializing opportunities in the development of the individual and that all relationships (child, family, society) are interconnected (BENETTI et al., 2013; BRONFENBRENNER, 1979).

The development of human movement happens similarly anywhere on the planet since most of the population can perform everyday movements and activities with relative competence: dressing, eating, playing, walking are some of the activities we can do with little or no formal instruction (DANTAS; MANOEL, 2009). However, some children have a lot of difficulties to perform these activities, and their motor skills are different from their peers but do not have classic neurological signs that can explain the problem (MAGALHÃES; CARDOSO; MISSIUNA, 2011). Currently, the term developmental coordination disorder (BDD) is considered the most appropriate to refer to these children (MAGALHÃES; CARDOSO; MISSIUNA, 2011). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) establishes four criteria for diagnosing DCD considering children who at the beginning of development have substantially lower acquisition and performance of coordinated motor skills than expected considering their chronological age and level of intelligence and the opportunity to learn and use the skill in the absence of neurological or physical problems (ASSOCIAÇÃO..., 2014).

The prevalence of DCD commonly reported in the literature is 5% to 6% of school-age children (BLANK et al., 2019). Brazilian studies reported rates ranging from 3% to 43%, depending on the region of the country, assessments used and cutoff point established depending on the motor test used (BARBA et al., 2017; BELTRAME et al., 2017; FRANCA; CARDOSO; ARAÚJO, 2017). The possible causes of DCD are still poorly understood, although it is considered as a neurodevelopmental disorder that leads to central nervous system problems, implying functional consequences (ASSOCIAÇÃO..., 2014; ZWICKER; HARRIS; KLASSEN, 2013). Boys and children with a history of prematurity and very low birth weight are more likely to develop DCD (ASSOCIAÇÃO..., 2014; ZWICKER et al., 2013). Also, motor problems are often associated with learning disabilities and attention deficit hyperactivity disorder (ADHD) (GOULARDINS et al., 2015; OLIVEIRA; NETO; PALHARES, 2018).

These children are sometimes called as "lazy," "sloppy," "slow," and they often fail to complete tasks at home and at school (SEGAL et al., 2002; MISSIUNA et al., 2006; MAGALHÃES; CARDOSO; MISSIUNA, 2011). Children with DCD tend to avoid activities that require more body effort and more difficult to do because the repeated failure to perform them (CAIRNEY et al., 2012). Children with DCD can avoid participating in more active games, physical education classes, and may lead to repercussions on physical and mental health, such as low self-esteem, poor motivation, social isolation and depression (CAIRNEY et al., 2012; MISSIUNA; CAMPBELL, 2014; CAPISTRANO et al., 2015).

As a key point in recognizing DCD, there are difficulties in performing activities that the child is expected to do or want to do, but he cannot do them (SMITS-ENGELSMAN et al., 2015). In this sense, children with DCD represent a considerable portion of the total referrals for occupational therapy (BLANK et al., 2019). From the perspective of the Canadian Model of Occupational Performance and Engagement (CMOP-E), occupational therapy is concerned with occupational performance and with transformation, meaning, identity, engagement, balance, and occupational justice (TOWNSEND; POLATAJKO, 2013). Occupational performance is defined as the actual execution of occupation, while occupational competence is the adequacy or sufficiency of an occupational skill satisfying the requirements of the environment (TOWNSEND; POLATAJKO, 2013). Engagement is defined as getting involved in a situation, participating (TOWNSEND; POLATAJKO, 2013). Engagement in occupation involves dynamic interdependence between the person, environment, and occupation.

DCD compromises the child's engagement in occupations, and these problems transcend the diagnosis of a motor disorder and may lead to social exclusion, low self-esteem, delayed learning, and problems in the family context (MISSIUNA; CAMPBELL, 2014). Children with DCD do not participate in the same activities as other children and may fail to explore their skills and may not be motivated to participate in new opportunities offered to them (ENGEL-YEGER; HANNA-KASIS, 2010; WAGNER et al., 2012; MISSIUNA; CAMPBELL, 2014). These issues are independent of socioeconomic and cultural conditions (ASSOCIAÇÃO..., 2014). Brazilian research groups have been investigating the impact of contextual factors such as environment and socioeconomic level on motor and cognitive development and performance, and the impacts on the perception of skills and motivation to learn and on the self-concept formation of children with DCD (BOBBIO et al., 2010; VALENTINI et al., 2016; COUTINHO et al., 2017; NOBRE et al., 2018).

The self-efficacy or perceived competence construct reflects the ability to assess their ability to perform a particular task (MISSIUNA et al., 2006). The perception of self-efficacy determines the activities they participate, the energy they use, and the degree of perseverance in the adversity and also predicts goals that individuals can set for themselves in their personal growth (BANDURA, 1997). In general, a strong sense of self-efficacy can be critical to achieving success they want to achieve (MISSIUNA et al., 2006). Besides being important to self-evaluate and identify therapy goals (MISSIUNA et al., 2006), the perception of self-efficacy of children with DCD can influence choices and preferences for certain activities (ENGEL-YEGER; HANNA-KASIS, 2010). The lower the self-efficacy, the worse the motor performance and the more restricted the activities in which children with DCD prefer to participate (ENGEL-YEGER; HANNA-KASIS, 2010). Thus, children with DCD can avoid participating in activities not only because of motor difficulties but also because of their low sense of self-efficacy (ENGEL-YEGER; HANNA-KASIS, 2010).

The self-concept and self-perception of the child are characterized as a set of cognitive attributions, such as personal and behavioral characteristics in everyday situations (OLIVEIRA; MATSUKURA; FONTAINE, 2017). This view varies according to the considerations of the individual's perceptions of himself and, as a consequence, of the judgment that the others make of him, mainly influenced by the interactions established in the family, social, and school contexts (OLIVEIRA; MATSUKURA; FONTAINE, 2017). Galvão et al. (2014a) reviewed studies on parents' perception of the routine especially at home and at school of their children with signs or already diagnosed with DCD. These parents talked about differences in their children's motor behavior and reported restrictions on participation in typical childhood activities. The socialization process and the lack of preparedness of the education system to deal with children's difficulties were among the concerns of theses respondents (GALVÃO et al., 2014a).

As all the reviewed studies were international, the authors warn of the importance of researching the perception of mothers of Brazilian children with DCD (GALVÃO et al., 2014a). Thus, they interviewed five caregivers of children identified with the disorder, and the results showed that the problems of motor coordination are still poorly recognized, and the

problems resulting from academic difficulties are more impactful (GALVÃO et al., 2014b).

Seeking to contribute to the literature in this area and moving towards understanding the point of view of mothers and children about motor difficulties, we start from the following research questions: what is the perception of mothers and their children about the possible impacts of DCD in daily life? Does the disorder influence children's self-concept and self-efficacy? This study aimed to investigate the perceptions of the mother-child dyad about the likely impacts of DCD on children's occupational performance and family daily life; and, as specific objectives: (1) to explore the relationships between children's occupations, skills and environment; (2) to investigate the possible impacts of the disorder on children's self-concept and self-efficacy formation.

2 Method

2.1 Design

This is an exploratory cross-sectional study that investigated the perception of children and their mothers on the possible impacts of DCD in the family's daily life. We chose the qualitative methodology because it is a more appropriate approach to explore people's interpretations of the way they live, think, and perceive reality (MINAYO et al., 2002). This research is part of a larger project that investigated the relationship between central auditory processing, sensory processing, and motor coordination in school-age children in the process of finalization, approved by the Research Ethics Committee of the Medical School of the Federal University of São Paulo. (CAAE 61403916.1.0000.0065; Opinion 1.856.907).

2.2 Participants

The largest study included 72 children, seven to ten years old, from two public schools in the city of João Pessoa, Paraíba. This study involved two municipal public elementary schools that agreed to participate. The age range of children refers to a stage of increased school demand, contributing to the possible recognition of academic problems and identification of their causes.

Children were initially evaluated with: **(1)** the - MABC-2 Movement Assessment Battery for Children 2 (HENDERSON et al., 2007) to assess their motor performance through direct observation. Children with percentile less or equal to 15 presented motor problems, and the percentile equal to 5 was considered the most severe condition of DCD; **(2)** Raven's Color Progressive Matrices, standardized for Brazilian children (ANGELINI et al., 1999) to assess their intellectual development. It classifies the cognitive level as intellectually superior, definitely above average, intellectually average, definitely below average, intellectually deficient; **(3)** Swanson, Nolan and Phelham (SNAP-IV) Brazilian version (MATTOS et al., 2006), to assess signs of ADHD, filled by the caregivers; **(4)** Sensory Profile 2, version in the process of translation and cross-cultural adaptation (DUNN, 2014), to characterize sensory processing; **(5)** data record form developed for the study of the child's growth and development history and data on socioeconomic and environmental conditions.

The caregivers were informed about the nature of the research and the possibility of the child presenting motor performance below the expected for his age, and in these circumstances, he would be called for interview and guidance. After agreeing to participate, the caregivers signed the informed consent form, and the children signed the consent form. After this battery of evaluations for the larger study, children invited to this study were eligible according to the following inclusion criteria: a) percentile equal and lower than 15 in the MABC-2 test; b) category equal or greater than III (intellectually average) in RAVEN. The exclusion criteria were: diagnosis of clinical conditions or neurological diseases; delay of more than one school year which could indicate other problems.

We identified seven children with motor performance below the expected for their age, but without a confirmed diagnosis, who, together with their mothers, were invited to participate in this study. Four mother-child dyads were excluded due to non-attendance despite two attempts at new appointments or, due to the impossibility of contact, all sources were exhausted. In the end, three mothers and three children agreed to participate in this study (Figure 1).

2.3 Data collection procedures

Eligible mothers and children were contacted by telephone, informed of their children's performance on the tests, and invited to attend the Clinical School of Occupational Therapy at the Federal University of Paraíba in July and August 2018 to be interviewed for the impacts of the child's difficulties in daily life and to receive guidance on how to improve their children's development and performance.

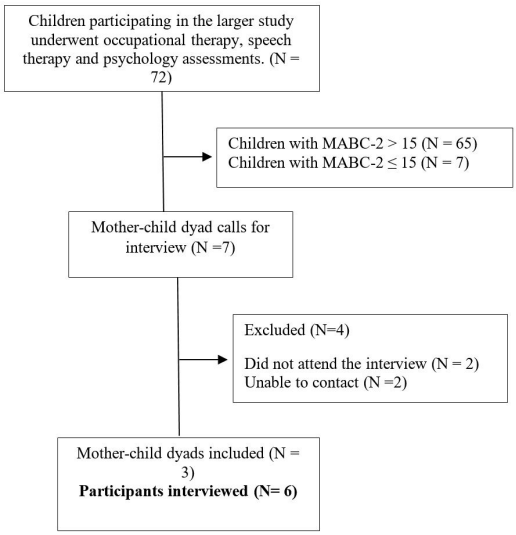

Figure 1. Flowchart of participant selection.

For the sample characterization, the mothers answered the Brazil Economic Classification Criterion - CCEB of the Brazilian Association of Research Companies (ABEP) (BRASIL, 2014) to estimate the economic level of the family. This questionnaire estimates the purchasing power of urban people and families, providing the classification of the population into economic classes. The CCEB scoring system is divided into two categories: item ownership and education of the head of family and access to public services. The sum of the total score defines which of the six classes the family is (A - around R$ 20,272.56; B1 - around R$ 8,695.88; B2 - around R$ 4,427.36; C1 - around R$ 2,409.01; C2 - around R$ 1,446.24; DE - around R$ 639.78).

The mothers answered the Developmental Coordination Disorder Questionnaire Brazilian version (DCDQ-Brazil) to confirm the difficulties in the child's performance in activities of daily living, school, play, and leisure (Criterion B suggestive of DCD according to DSM-V) (PRADO; MAGALHÃES; WILSON, 2009). The DCDQ-Brazil has 15 items distributed in the following sessions: control during movement, fine motor skills, and writing, gross motor skills, and planning, global motor coordination. The items are scored on a five-point scale, with a maximum score of 75. The higher the score, the better the child's performance in the activity according to the respondent. Although there are no Brazilian standards for the DCDQ-Brazil, the proposed cutoff points for Canadian children have been used, as the performance averages are similar in both countries (PRADO; MAGALHÃES; WILSON, 2009). The child has motor problems that are reflecting on the performance of activities if: from five to seven years and 11 months old has a total score of 0-46; from eight to nine years and 11 months old, obtained a total score of 0-55; from 10 to 15 years and six months old, obtain a total score of 0-57.

Mothers and children were interviewed at the same time in different rooms by two researchers (CL and CA). A guiding script was elaborated for the semi-structured interview so that mothers and children could talk about their perceptions about the impacts of DCD on the daily lives of children and their families. This script was built according to data obtained in the literature (GALVÃO et al., 2014b) and based on the interviewer's experience (CA) with children with DCD and their families (ARAÚJO; MAGALHÃES; CARDOSO, 2011; ARAÚJO; CARDOSO; MAGALHÃES, 2017). Initially, mothers were encouraged to talk about how the child did the homework, how he get organized, get dressed, take a shower, help with housework, and then about the child at school, playing, and relating to friends. The questions were triggered as the mother talked to the interviewer so that they could talk freely about the topic.

To investigate whether motor difficulties were identified and perceived by children, the methodological technique was different: a free-drawing activity was proposed to the child, while the researcher (CL) conducted an open interview to make the child comfortable to talk about it. Oliveira (2012) understands research as a creative act and that the researcher can use instruments appropriate to his or her object of study without using a way to label realities (OLIVEIRA, 2012). Also, interviewing children is a challenge, as it is necessary to think of innovative ways for the child to interact with the researcher and express their ideas. This allows the child to contribute to the researcher's understanding of their ways of seeing and thinking about their life contexts (FOLQUE, 2010).

The interviews were recorded on audio equipment (Samsung Galaxy Tab 4 Tablet, via Voice Recorder application) with the permission of the participants. The interview time with both mothers and children ranged from 30 to 40 minutes (total of 126 hours and 31 minutes of recording). Then, the interviews were fully transcribed by the researcher (CL).

2.4 Data analysis

We opted for content analysis to allow the researcher to find answers to the questions asked, confirming or not the hypotheses established before

the investigation, and find out what is behind the manifested content (GOMES, 2002). The analysis process was conducted in stages: pre-analysis, coding (raw data transformation, clipping, aggregation, and enumeration for analysis organization) and definitions of different categories (GOMES, 2002; MINAYO et al., 2002; BARDIN, 2010).

The theoretical references used were the bio-ecological theory of Bronfenbrenner (BRONFENBRENNER, 1979; BRONFENBRENNER; CECI, 1994) and the Canadian model of Occupational Performance and Engagement (CMOP-E) (TOWNSEND; POLATAJKO, 2013) to understand the coping processes that the child with DCD and his family experience.

Bronfenbrenner's (1979) bio-ecological approach explains that lack of opportunity can come from two central spheres: macrosystem and microsystem - by the impact of the cultural context, subculture, poverty, wealth, and by the situations the child has direct personal experience, such as family relationships. In the exosystem layer, situations not directly experienced by the child in daily life, but that affect the microsystem layer are considered; the family. According to this approach, the child's development occurs from the interaction of the concentric layers, which are situations experienced by the individual, in which all the influences of the environment are related to each other (BRONFENBRENNER, 1979).

The CMOP-E contributed to the understanding that there is a dynamic interaction between the individual and the different perspectives of his life characterized as the triad: environment - occupation - person. Every individual (with its cognitive, affective, physical, and other components) is inserted in an environment - physical, cultural, social, or institutional - engaged in occupations (TOWNSEND; POLATAJKO, 2013). Environmental factors - social and economic - may represent barriers or facilitators for children's engagement in activities meaningful to them. The CMOP-E understands that the environment influences human occupation and the person can adapt and acquire new skills for the new life contexts (TOWNSEND; POLATAJKO, 2013).

3 Results and Discussion

The results will be presented along with the discussions from the interviews with mothers and children. The characterization of the participants was summarized in tables 1 and 2.

From the analysis of the interviews, the themes that stood out among the speeches and guided the construction of the following categories emerged:

Table 1. Children's profile.

	Child 1	Child 2	Child 3
Gender	Male	Female	Female
Age	9	9	8
School	School A	School A	School B
MABC-2	5	5	5
DCDQ – Brasil*	31	-	54
SNAP-IV	Presence of clinical signs of lack of attention and/or hyperactivity	Presence of clinical signs of luck of attention and/or hyperactivity	Absence of clinical signs of luck of attention and/or hyperactivity

*According to the cutoff point for the age, as indicative of difficulties in the performance of activities of daily living, school and playing for children 1 and 3, the mother of child 2 could not inform about the child's performance in some items of the questionnaire, and the total score cannot be predicted.

Table 2. Informant Profile.

	Informant 1	Informant 2	Informant 3
Characterization	Mother = M1	Mother = M2	Mother= M3
Age	34	38	45
Marital status	Married	Single	Divorced
Number of children	01	04	01
Education level	Incomplete Middle school	Illiterate	Incomplete Higher education
Informant occupation	Housewife	Diarist	Trader
Economic classification	C1	D-E	C1
Approximate Income	One minimum wage	Less than one minimum wage	Greater than five minimum wages

offering opportunities to play and do, the impacts on the school, and, within this, the subcategory relationship with others.

3.1 Offering opportunities to play and do

The opportunities experienced by the children identified with DCD were a recurring theme. In general, all mothers perceived the influences of their children's difficulties and factors in the contexts in which they lived when offering opportunities to learn and practice daily skills.

> *No, I let him play at home, in my house, there is a video game there he plays with the boys, who come to play with him* (M1).

> *No, she plays, she watches TV more and plays with her, she has one, she walks, it is what she is playing with now, the doll so much, she rips her head, rips arm and goes straight to the trash. Then now she is only with the walks, only plays with what she has* (M2).

> *She plays with the girls, I just don't let her play with a boy anymore, I used to, but now I don't let her anymore. When she's playing with a boy, I put her inside. There are only two boys that I let her play who are my neighbors where I live because I live there for rent I live in a village, but in the middle of it is in the middle of the street playing with a boy I do not leave anymore. She plays with a girl, or she does not play with anyone; she stays indoors and plays alone* (M2).

Given the factors that influence the opportunity for interviewed children to learn and develop skills, we obtained two parameters: 1) few opportunities - children 1 and 2 lived in a different context, with a high rate of socioeconomic vulnerability, violence, and hazardousness; 2) increased opportunities - child 3 lived in a context of restricted opportunities due to the physical space in which he was inserted and started to have opportunities with changing environment, that is, the child had an increased opportunity to experience situations not common before in his daily lives.

> *Until last year, we lived in my parents' apartment, which has no space; it has this detail... And as I spend the day working, I'm very careful that she doesn't fall, for her not ... to happen ... she has a bicycle, but I never let her use it, fearing because there is no space there, it's a garage, then it was very dangerous, or it was on the street or where the cars are. Then when it was from last year here, I got it, we managed to live in our apartment, it's not a mansion, but it's ours. Then there is a space, a better area, she has her room, she doesn't sleep in the room with me... And there is a space for children, a space to play, so she freer. Even though she is having a period like this, with my parents, a period I'm working on, but she plays with the other children at night, socializing better* (M3).

Maior and Cândido (2014) used the criteria (economic, social, and environmental) proposed by other Brazilian researchers to research on vulnerability and analyzed different places in the city where this study took place. The context in which children 1 and 2 lived was considered a community with high socioeconomic vulnerability, something that is reinforced in mothers M1 and M2 about the place, reporting and recognizing the place as violent and dangerous, being one of the barriers attributed by them to the participation of children in the community (MAIOR; CÂNDIDO, 2014).

However, M3 lived in a gated community in a middle-class neighborhood, where child 3 began to experience opportunities from the change of context, including school. M3 referred to this change. Although this contextual issue has emerged, it is interesting to note that both M2, and children 2 and 3 stated that they play indoors. That is, in general, mothers and children stated on offering opportunities that their children were subjected - restriction and increase - are possibly mediated by the context factor, but it is noticeable that issues inherent to motor coordination problems and preferences for less active activities also influence the activities in which children choose to participate.

> *She improved on the activities a lot* […] *this year she made a very big leap, don't you know?* (M3).

> […] *she plays at home, now there are some girls there that she befriended, then she is playing more at home now, isn't she? When she gets home from school, but that's all* (M2).

> *Playing in the small house, it's... Playing in the dollhouse* (Child 2).

> *Barbie, at Barbie's house with my friends, I watch TV* (Child 3).

> *Because sometimes I'm playing, then I get stumped at home, and I accidentally knock things over, my mom doesn't like it…* (Child 2).

The relationship between physical and social context or environment and development seemed to be linked to issues related to DCD. In some situations, the children have the opportunity to experience

playing in their daily lives, but the activities are more restricted to video games, dolls, and what is available to them more often at home (CAIRNEY et al., 2010; ENGEL-YEGER; HANNA-KASIS, 2010). These results showed the interrelationship between the microsystem and the mesosystem according to the ecological theory of Bronfenbrenner (1979). The child in a given context (micro) - his activities, roles, relationships, and physical characteristics - may or may not interact with another context - such as the neighborhood or community (meso-system) in which he/she is inserted to participate actively. The essential idea of ecological theory is that human development is influenced by changes that occur in the cultural, social, economic environment and by life histories, experiences, beliefs, and behaviors (HADDAD, 1997).

Children 1 and 2 recognized their motor difficulties and avoided games that require their motor skills and agility to run.

> *You don't like to run, don't you? No, miss.* (laughs) *Because it's boring, miss. Very! I fall too much." He added: "No. I'm not much in the street; I play more with my friend in PlayStation 2, Mario. Maaaaaario ... I don't like to play on the street very much. Because it's boring, the person keeps falling, you get hurt. My mother said it's normal. I stay home, me and my friend* (Child 1).

> *Because sometimes I'm playing, then I get stumped at home, and I inadvertently knock things over, my mother doesn't like it* […] (Child 2).

The speech of child 1 reflects his behavior and situations that occurred even during the interview. In one of the episodes, the child got up to throw a paper in the trash and even fell by slightly lowering his head and legs to reach it. At this moment, the child fixed her eyes on the interviewer, lowered her head with a look of sadness, and said, *"It's always like that, miss".*

The Canadian Occupational Performance and Engagement Model (CMOP-E) is a dynamic model that allows the occupational therapist to think about the interaction between the person, environment, and occupation, as well as occupational engagement, beyond competence in performing the tasks that make up human beings occupations (TOWNSEND; POLATAJKO, 2013). Understanding how a person engages and participates in life situations is central. Children with DCD may have limitations in occupational engagement not only by physical motor coordination problems but by how the dynamic interaction of their characteristics (physical, affective, cognitive, beliefs) with the environment in which they live occurs. The cultural and social contexts such as family, neighborhood, and school also offer meanings to occupations and the way children perceived themselves in this interaction.

The child who has a perception of positive self-efficacy - affective domain in CMOP-E maintains the belief that he can achieve the desired results, able to make plans, and set goals related to the activities they want to perform. On the other hand, the perception of negative self-efficacy can lead the child to present problem abandonment behaviors, impacting on health and well-being in their life, influencing motivation and learning for the demands of activities and participation (OLIVEIRA; MATSUKURA; FONTAINE, 2017; ENGEL-YEGER; HANNA-KASIS, 2010).

Besides the perception of self-efficacy, their self-concept can also affect the child's self-confidence system, thoughts, feelings, and actions, and limiting occupational engagement. Assuming that self-concept is also based on judgments that others make about the child, it is understood that caregivers, teachers, and others can also influence and impact on the child's perception of themselves and their abilities (OLIVEIRA; MATSUKURA; FONTAINE, 2017).

Children with DCD avoid participating in activities that require these skills and tend to show little or no interest in sports and games that require finer coarse or fine motor coordination (CAIRNEY et al., 2007). Therefore, child 1 suggested in his speech the interest in games that do not require more than he can, that is, the effort to perform motor skills in games that cause suffering and distress, maintaining the preference for video games and superhero games.

> *Ah, we play a lot of things* […] *Ah, we play a superhero, like ... It's easy, imagine that you're a* […] *We play things of heroes, like ... Naruto, do you know what naruto is?* […] *We play dragon bool, naruto, we play, of ... We play a loto f things, it is ... I almost don't know* (Child 1).

However, children 2 and 3 preferred games that challenge their motor skills and have opportunities to experience them in their daily lives, both in the school context and in the community. According to Cairney et al. (2010), deficits in the participation in organized activities and free games of boys with DCD tend to decrease over time, while in girls with DCD, participation tends to increase slightly (CAIRNEY et al., 2010). However, in this study, child 1 (boy) reported a decreased participation in more active activities and perceived the interference of their difficulties, while children 2 and 3 (girls)

tried to engage in organized activities and play freely at least in the school and community context.

> *Anything, hide and seek, touch game, touch ice ...* […] *I'm not very close to the ball* (Child 2).

> *Hide and seek, it's ... Boy catches girl, it's ... Chess, we play with dolls at school* […] *soccer, I like to dodgeball too* (Child 3).

The interrelationship between the opportunity and the routine also stood out in this category since to optimize time, avoid frustrations and hassles, mothers usually complete activities for their children. Children are also rated lazy about their performance on ADL. Initially, when asked about how their children performed their activities of daily living (ADL), the mother of child 1 was exhaustive:

> *It takes time... I put the clothes on him.* […] *Taking a shower, he takes like this, goes to the bathroom, gets wet, at the time of the shower, right? That he goes, pretty fast. Then I do it, let´s take a shower "N," then sometimes he does not take a shower, then I go there and bath him. To wear the clothes sometimes it's the same way, he doesn't want to put the clothes on and get wrapped with the towel, so I go there and put the clothes on him, but sometimes I think it's his laziness, I don't know. I keep thinking like that, sometimes I think* (M1).

> […] *sometimes he puts it wrong* […] *it's not every time, but sometimes he puts it, then I say, it's wrong, take it, it's not like that, then he goes there and puts it right* […] *the clothes sometimes he worn, the shirt. Sometimes the shorts from back to front, front to back* (M1).

> *As I lived at my parents' house, they woke up, they had to wake up very early, because the van was too early, I organized. I got her dressed* […] (M3).

The change to child 3 happens when the mother stops doing the activities for her, offering the child the opportunity:

> […] *Oh, as we were in our house, then I said, look, my daughter, your mother needs to rest, and you're about to do your own thing. Then she is right... like this, dressing alone, getting ready, choosing her clothes only* […] *when she got the shoes, I have to... tie them* […] (M3).

In contrast, M2 reported that her daughter does her ADLs independently: *"She puts on sneakers on her own, she ties them, she doesn't do well, but she does"* (M2). The relationship between doing and the opportunities experienced in everyday life says a lot about the possibilities of using and experimenting with children's abilities and ability to perform them. In general, the care and time offered to children with DCD in day-to-day activities are greater than the time provided for typically developing children of the same age (SUMMERS; LARKIN; DEWEY, 2008). There were also reports of recognition of the problem due to not performing ADLs:

> *For me, I think it's… I don't know, right. Because for his age, right, this was not the time to do that, right* (M1).

The difficulties when performing daily activities are not always related to the child's motor coordination problems. DCD is still poorly recognized and considered by parents and teachers when trying to explain children's performance. This is reinforced in the words of mothers: children are rated as lazy, disinterested, and stunned for not being able to perform the day-to-day activities that a child of the same age performs with mastery. By leaving this issue aside, problems can increase. Studies indicated that motor coordination problems are not brief and typical of childhood and may impact on adulthood (TAL-SABAN et al., 2012), leading to a higher rate of depression, social and emotional problems in individuals with DCD (CAIRNEY et al., 2010; MISSIUNA; CAMPBELL, 2014).

The early identification of DCD is a means to predict the levels of activity participation of children diagnosed with the disorder, as they have barriers to participation and involvement in several activities such as self-care, academic tasks, play, leisure and social involvement (MAZER; DELLA BARBA, 2010; ROSENBLUM; ENGEL-YEGER, 2014). Parents often perceived some problems in performing common tasks; however, when reporting these concerns to healthcare professionals, DCD is disregarded for lack of awareness of the disorder (ROSENBLUM; ENGEL-YEGER, 2014). Early identification is critical to preventing more serious emotional issues related to decreased success and participation in different environments.

Therefore, parents, caregivers, and teachers need to know about DCD and its impacts to early identify problems and act immediately (MAZER; DELLA BARBA, 2010; OKUDA, 2015; ROSENBLUM; ENGEL-YEGER, 2014).

3.2 Impacts on school

One of the criteria for DCD diagnosis is the significant interference with the performance or participation in activities of family, social, school, or community life. The difficulties of their children

in performing school tasks, arousing their eyes, and pointing to some problems were the issue that most stood out in the interviews of mothers. The three mothers recognized the difficulties of their children but believed that is more for laziness and lack of interest in school activities.

The mothers of children 1 and 2 in their speeches shared the same anguish and concern about their children's behavior and learning at school.

> *I don't know if it is lazy. I don't know what it is. I don't know either, maybe the teacher, but also she says she talked to me yesterday and said she's not talking, but she said it's ... he's developing more because now she put her name there she goes there and starts writing very slowly, it takes only that* (M1).

> *So far for me, like, she hasn't learned anything. Because she doesn't know the alphabet yet, she doesn't ... she's is not interested in that part. I find her disinterested because the teacher... from the beginning when I put her to study, she always joked, talked, she doesn't pay attention to what the teacher is teaching, she is disconnected. Her thing is giving attention to others. I was often called from the beginning when I put her to study on that because she stopped doing her things, to go help her classmates, so conversation, she got distracted, most of the time I was called at school, it was more so because she is so distracted* (M2).

> *Because… she… the first year she went to private school, the principal wanted to fail. The private school, to price and such, also wanted her to repeat the first year. She didn't read. She had extra classes, but still she couldn't read. My mother is a teacher but had no patience, is already retired; she is elderly. When it was the sophomore year, she went to public school, all that adaptation, but she also left without being able to read. It greatly improved writing. When she entered the third year she stayed in school A she went to another school B, which she got, before the middle of the year was literate. That's why I say that was the leap. For math she has a...* (M3).

All three children obtained a percentile 5 in the motor performance test, which indicated a more pronounced presence of motor problems, which interfere with activities at home and school, and participation in games and playing. Besides being inserted in a different context than child 3, children 1 and 2 showed clinical signs of lack of attention and/or impulsivity/hyperactivity problems. About 50% of children with DCD have learning difficulties and ADHD (GOULARDINS et al., 2015; OLIVEIRA; NETO; PALHARES, 2018). In most cases, at the beginning of elementary school the child begins to have the first complaints of difficulties at school and often has to do with motor difficulties, although they are not always identified as a problem (MAGALHÃES; CARDOSO; MISSIUNA, 2011). For the children in this study, learning disabilities may also be present and should be further investigated.

Given that school activity requires several motor skills to be performed together, which for children with DCD is more difficult to do, children are rated as lazy, disinterested and suffer from failing to complete or to do the tasks of the school:

> *Yeah, sometimes he says, okay, take my hand right away because you don't do the task in my place. Then I say: no, you have to do it. I'm already helping you by taking your hand. Then, I help him; then he finishes the task, then he does it* (M1).

> *It's because she's disinterested, you teach her now, when you ask, she doesn't know anymore* […] *A little to not say it's so much, right?* (laughs) *The person laughs, but the boy is serious, he is very... I don't know, he is very disconnected from life, not interested in things, to teach her work, there is the time that she gets stressed. Because you are explaining and she is laughing, she doesn't take anything seriously; she jokes, miss* (M2).

> *To follow, she doesn't follow much. Yesterday, always the boys sometimes, who is more unrolled than she finishes fast and she is still doing the task* […] *is, because, so, she has, she has a little bit of difficulty getting out of the picture even* (M2).

The tone of voice and gestures during the interviews with M2 and M1 were sad and worrying due to the difficulties and problems faced by children in the school context. Writing problems are present in the school routine and are closely related to DCD. Another point to be emphasized within the school environment, often undervalued by teachers, is the lack of involvement and poor performance in physical activity for their age, which has psychosocial implications to consider, such as social exclusion and low self-esteem, impacting school performance (CAIRNEY et al., 2012; MISSIUNA; CAMPBELL, 2014; CAPISTRANO et al., 2015).

3.2.1 Relationship with others

This subcategory was proposed because the theme emerged strongly in the speech of the dyad 1 when they talked about everyday life in school. As it is a relevant subject, it became important to highlight

the reports of M1 and child 1 about the relationships experienced with peers in school and the community. Given that personal relationships impact the way we relate to the world, M1's speech pointed to the reality lived by her child in the school context and related to the impact of the child's relationship with peers, showing the child 1 suffering, who often prefer to distancing from activities with other colleagues to avoid conflicts.

> *He only talks about the playground when his colleagues hit him* […] *his colleagues hit him there, and he said you see, I didn't even want to leave the room, see mom, I didn't even want to leave the room, the boys they are complaining about me, so I stay inside the room* (M1).

> *He says… that I'm boring… He hits me. I don't know; he's very annoying; he calls me a pipsqueak. I can't pass his side, he hits me* (Child 1).

> *No, just him, he teases everyone. The boy down the street, he teases me too* […] *he won't let me ask. He is worse than the other; I only pass by his side that he gets irritated* (Child 1).

The literature highlights that children with motor coordination problems tend to have fewer friends and not be invited to play games with others. Children often still become the object of teasing, avoiding participation in environments that have physical activities and play in groups involved, making even more scarce opportunities to practice their skills and experiences with each other (MISSIUNA; CAMPBELL, 2014; SEGAL et al., 2002; WAGNER et al., 2012).

Feelings related to the perception of competence and self-esteem of children with DCD are topics frequently discussed in the literature (ENGEL-YEGER; HANNA-KASIS, 2010; MISSIUNA; CAMPBELL, 2014). When drawing during the interview, Child 1 expressed what other people say about him: (Crying expression)

> *Mimimi ... Everyone says I only scribble; I don't do anything right.* […] *A neighbor in my schoolroom, he is very annoying. Then he said I only scribble.*

4 Final Considerations

The reports of mothers and children showed the perceptions about themselves and their children and explore the possible relationships between occupations, individuals, and the environment in which they operate, as well as the way these relationships and the perceptions of the child can interfere with activity engagement.

Although they perceived the problems their children face, mothers related them to learning disabilities. The clumsiness and slowness of children to do day-to-day activities such as dressing, undressing, eating, self-care, etc., may not be as relevant as the difficulties in the school context shared by all mothers, and which can also be linked to the DCD such as writing, board copies, clipping, organizing materials and performing school tasks on time and more independently. There is commitment of mothers to seek help, and understanding about the difficulties experienced by children and factors of context influence the offer of opportunities for motor and relational experiences from playing.

The mothers in this study also showed that they perceived their children as "lazy" and "clumsy," reproducing a common speech for the children with DCD. Often mothers reported that they have to do certain activities for their children because they believed that the children are not able or do not do well. Personal and behavioral characteristics in everyday situations lead the child to form self-concept and perception of competence (self-efficacy). This may vary depending on the individual's perceptions of himself and the judgment that other relevant people make of him, especially the relationships he develops in the family, social and school contexts.

The results of this study showed that the problems of motor coordination are not identified and recognized, which points to the importance of clarifying mothers, educators and health professionals about the characteristics of DCD and the presence of co-occurrences, so the child and the family have adequate support to facilitate engagement and participation in their life contexts. Participants in this study received guidance on how to improve their children's development and performance in performing routine activities and think of solutions to minimize frustrations when facing everyday difficulties.

Some limitations can be described as the low number of participants, even if sufficient data have been obtained to discuss the realities experienced by children with DCD and their mothers. A single opportunity to interview the child may also be a limiting factor, understanding that if there were more interview sessions, the children might have been more comfortable talking about themselves.

We believe that the study may contribute to reinforce the need to report on the impacts of the motor problem potentially influencing performance at home and school activities and participation, and consider the role of the environment and providing opportunities for these children.

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Author's Contributions

Carolline Cristinne Morais de Medeiros and Clarice Ribeiro Soares Araújo were responsible for data collection, organization, and text review; Carolline Cristinne Morais de Medeiros was responsible for the interview transcription and analysis. The other authors were responsible for the final critical review. All authors approved the final version of the text.

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