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The use of orthoses in children with cerebral palsy: perception of caregivers

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Abstract: The orthoses can be used as an adjuvant in the rehabilitation of children with Cerebral Palsy(CP). Studies that investigate caretakers' opinions over the use of the orthoses are fundamental, especially for propositions that aim to produce a positive impact on the use of orthoses by the children. This study's objective was to identify the perception of caretakers of children with CP over the functionality, benefits, and satisfaction over the use of the orthoses. Eighteen caretakers of children with CP, who used upper and/or lower limb orthoses, participated in this study. The data was obtained with questionnaires with open and closed questions. Descriptive and quantitative analysis of the data was made. The results suggest that the satisfaction with the orthoses is linked to the consideration of the caretaker's opinions during the period of prescription and confection of the orthoses; to the guidance provided by professional; to the noticed improvement of the range of movement of fingers and wrists and the increase of the child's balance and confidence while walking. Disconsidering the caretaker's opinions over the orthosis and the perception that the orthoses cause pain or discomfort contributed to the dissatisfaction and/or partial satisfaction of the caretakers. The results of this study may be useful for professionals from many areas of knowledge because they provide a basis to contribute for the efficacy of prescription and intervention by healthcare professionals, as well as elements that may help designers to make orthoses that fulfill the user's expectations and so increase usability, comfort, and satisfaction.

Keywords: *Orthoses, Cerebral Palsy, Perception, Caretaker.*

O uso de órteses em crianças com paralisia cerebral: percepção dos cuidadores

Resumo: A órtese pode ser utilizada como adjuvante no tratamento de reabilitação de crianças com paralisia cerebral (PC). Estudos que investigam a opinião dos cuidadores em relação ao uso da órtese são de fundamental importância, especialmente para proposição de melhorias que visem impactar positivamente no seu uso pela criança. Objetivou-se neste estudo identificar a percepção de cuidadores de crianças com PC sobre a função, os benefícios e a satisfação com o uso das órteses. Participaram 18 cuidadores de crianças com PC usuárias de órteses de membros inferiores e/ou superiores. A coleta de dados foi feita por meio de questionário contendo questões abertas e fechadas. Realizou-se análise descritiva e quantitativa dos dados. Os resultados sugerem que a satisfação dos cuidadores se relacionava com o fato de terem sua opinião considerada durante o processo de prescrição e confecção das órteses; com as orientações fornecidas pelos profissionais; com os benefícios percebidos pela melhora na amplitude de movimento de punho e dedos e pela maior confiança e equilíbrio da criança ao andar. Desconsiderar a opinião sobre a órtese, a percepção de que a mesma causa dor e desconforto contribuíram para a insatisfação e/ou satisfação parcial dos cuidadores. Os resultados deste estudo podem ser úteis para profissionais de diferentes áreas do conhecimento, pois trazem subsídios que podem contribuir para a eficácia da prescrição e intervenção por parte dos profissionais da saúde, bem como elementos que podem colaborar para que profissionais do design projetem órteses que atendam aos requisitos do usuário com vistas a favorecer a usabilidade, conforto e satisfação.

Palavras-chave: *Órteses, Paralisia Cerebral, Percepção, Cuidador.*

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1 Introduction

Cerebral palsy (CP) is a condition frequently interfering with the learning of childhood motor skills, which are essential for the performance of activities and tasks of the daily routine (DURSUN; DURSUN; ALICAN, 2002; WHITE et al., 2002).

The definition of Leite and Prado (2004, p. 41) is one of the most definitions used to characterize CP as

> [...] a permanent, though not invariable, disorder of movement and posture, due to defect or non-progressive brain injury in the beginning of life [...].

In other words, CP is characterized as a change in controlled or postural movements, with early secondary signs to a central nervous system (CNS) injury or dysfunction that may occur in the prenatal, perinatal or postnatal period.

There are different resources, methods and therapeutic intervention approaches to minimize difficulties and to facilitate the functionality and participation of children with CP in daily activities. Assistive Technology (AT) resources such as orthoses are cited as adjuvants for rehabilitation treatment. Orthoses play a key role because, in addition to protecting the healing the structures, they also maintain and/or promote the joint range of motion to replace or increase its function, preventing or correcting deformities, providing joint rest and reducing pain (FESS, 2002; TROMBLY, 2005).

Studies have shown several benefits by the use of different types of orthoses in children with CP. Lower limb orthoses improve the locomotion pattern, decrease excessive plantar flexion of the ankle, and provide benefits in both the qualitative parameters of gait and in gross motor performance, with lower energy expenditure (CURY et al., 2006; MATTACOLA et al., 2007). Besides the physical benefits, such as prevention of deformities through the control of spasticity, the orthoses can contribute as the patient being independent as possible in the activities of daily living, improving their quality of life (CARGNIN; MAZZITELLI, 2003). The abductor thumb orthoses may be useful in the treatment of children with spastic CP since it allows an increase in the active range of motion of the hand and can be used as an additional resource to other therapies (RODRIGUES et al., 2007a).

Although the literature has pointed out the efficiency using different orthoses, there are reports of the high dropout rates and other AT devices. About 30% of all purchased devices are abandoned by the user between the first and fifth year of use and some are not even used (PHILLIPS; ZHAO, 1993; RIEMER-REISS; WACKER, 2000). This abandonment of the different devices have several reasons such as the lack of information on their function and training of users, irritability with use and discomfort (RIEMER-REISS; WACKER, 2000; COSTA et al., 2015).

In this sense, it is relevant to involve users and family members in the process of selecting the different AT resources since they can be clear about the possibilities and limitations verified in the evaluation process and be assisted in deciding which resource will most effectively meet the need perceived (BERSCH, 2017).

Studies have shown that the expectations regarding the use of AT showed by the caregivers of children with CP are the desire to improve self-esteem, acquire autonomy, social and school skills. On the other hand, caregivers demonstrated insecurity about children's ability to use the resource and the possibility of frustration of the family expectations (BITTENCOURT et al., 2016).

Understanding the factors that can lead to the abandonment and/or the effective use of orthoses is very important. Most of the studies on this topic were performed with adult users, so there is a lack of information regarding the perception about the orthoses used by children. The knowledge of such perception can bring subsidies to improve the effectiveness of prescription and intervention by professionals, besides contributing to promote usability and promote effective results for these users.

Therefore, the objective of this study was to identify the perception of caregivers of children with CP in the function, benefits, and satisfaction when using orthoses.

2 Method

This research is a descriptive study with a quantitative approach carried out in a clinical school linked to a public university in the interior of São Paulo that offers outpatient assistance in the areas of physiotherapy, speech therapy and occupational therapy to individuals with different disabilities.

This study was approved by the Research Ethics Committee of the School of Philosophy and Sciences, Unesp, Marília, under opinion Nº 1,552,049, in accordance with Resolution 196/96, in compliance with the ethical precepts of research involving human beings. Participants were informed about the objectives and procedures of the study and assured about the confidentiality of their personal data. Subsequently, they signed a Free and Informed Consent Form confirming their agreement.

2.1 Participants

The non-probabilistic convenience sample consisted of eighteen (n=18) primary caregivers, which there were fourteen mothers, two fathers and two grandparents of the children with CP. The selection of the sample met the following inclusion criteria: to be primary caregivers of children with CP using orthoses of lower and upper limbs assisted at the school clinic in the physiotherapy and occupational therapy services. Sporadic caregivers of children with CP and those who did not agree to participate in the study were excluded.

2.2 Instrument and procedure for data collection

A structured questionnaire containing two open questions and 16 closed questions was used for data collection, which was elaborated based on instruments described in the literature, such as ATOMS Project Technical Report - Factors in Assistive Technology Device Abandonment: Replacing "Abandonment" with a "Discontinuance" (LAUER; RUST; SMITH, 2015), Quebec User Evaluation of Satisfaction with Assistive Technology (DEMERS; WEISS-LAMBROU; SKA, 2000); *Escala de Satisfação do aparelho auditivo no dia a dia* (COX; ALEXANDER, 1999) and Functioning Everyday with a Wheelchair (MILLS et al., 2002). The questionnaire was composed of two parts. The first part contained questions that aimed to identify the time of use of the orthoses by the children, the professionals that prescribed it and the knowledge of the caregivers regarding the function of the orthoses. In the second part, the caregiver had the task of indicating *satisfaction* or *dissatisfaction* with the use of the orthosis. After their indication, the caregiver pointed out the aspects listed previously in the categories of personal, aesthetic and emotional factors that influenced his satisfaction or dissatisfaction and then he justified his answer.

Data were collected by the researchers in the outpatient service, according to the availability of the caregivers, with an average time of 40 minutes. Data collection was performed between June and September 2016.

2.3 Data analysis

The data were tabulated in a Microsoft Excel® 2010 spreadsheet. The quantitative data on the socio-demographic aspects of the caregivers (gender, type of kinship to the child, education level, family income and age), data related to children with CP (gender, age, topographic impairment, orthosis type used) and the answers given to each question in the questionnaire were submitted to statistical tests of simple descriptive analysis.

3 Results

Firstly, the socio-demographic data of caregivers is shown in Table 1.

The table below shows that most caregivers were female (88.9%) and mothers (77.8%). Regarding the age group, the mean age was 38.8 (± 9.7). The oldest caregiver was 57 years old and the youngest was 23 years old. Regarding the school level, all the caregivers were literate and most (61.1%) had completed High School. Regarding to the family income, most of the caregivers (61.1%) had monthly income ranging from one to two minimum wages, 27.8% had monthly income above three minimum wages and 11.1% had one monthly minimum wage.

Data on children with CP are shown in Table 2.

Table 1. Socio-demographic data of caregivers.

Variables	Value	Frequency	n(%)
Gender	Female	16	88.9%
	Male	2	11.1%
Type of kinship	Fathers	2	11.1%
	Mothers	14	77.8%
	Grandparents	2	11.1%
Education level	CES	5	27.8%
	CHS	11	61.1%
	CHE	2	11.1%
Monthly family income	One MW	2	11.1%
	One to two MW	11	61.1%
	More than three MW	5	27.8%
Age	21 to 30 years old	2	11.1%
	31 to 40 years old	10	55.6%
	41 to 50 years old	2	11.1%
	More than 51 years old	4	22.2%

CES = Complete Elementary School; CHS = Complete High School; CHE = Complete Higher Education; MW = Minimum Wage. Source: Created by the authors.

Table 2 shows that most of the children were male (61.1%), their mean age was 5.8 (± 3.2), the oldest was 12 years old and the newest was one year old. Regarding topographic impairment, most children had quadriparesis (55.6%) and the others had paresis (22.2%) or hemiparesis (22.2%).

Regarding the type of lower limb orthoses used, 94.4% of the children used Ankle Foot Orthoses (AFO). Fifty-five percent of them (10) also used upper limb orthoses (ventral static orthoses for resting and thumb abduction) and only one child used only upper limb orthoses (ventral static orthoses for resting).

Table 3 shows the data of the professionals who prescribed the orthoses and their time of use.

The table above showed that the professionals of Physical Therapy and Occupational Therapy predominated in the prescription and indication of the orthoses. Table 4 shows the participants′ knowledge regarding the function of the orthoses.

The results of Table 4 show that most of the participants (94.4%) knew about the function of the orthoses used by the children.

When questioned about the satisfaction with the orthoses, 61.1% (11) of the participants were very satisfied; 16.7% (3) were satisfied; 11.1% (2) mentioned that they felt partially satisfied and another 11.1% (2) were dissatisfied. After the indication, the caregivers pointed out the aspects listed previously in the categories of personal, aesthetic and emotional factors that influenced their satisfaction or dissatisfaction with the use of the orthoses, and then they justified their answer. Table 5 shows the frequency of each aspect cited by the participants in each of the categories. Thus, it was opted to group the values of the relative and absolute frequency presented in the previous paragraph.

The data in Table 5 indicate that most caregivers thought that satisfaction when using the orthosis was related to the following factors: the time of use of the orthosis was not very long (77.8%); periodic evaluations by the professionals (100%); the adaptation of the child to the orthosis (61.1%); the culture and religion do not interfere with its use (100%); receiving guidance on the use of the orthosis (77.8%); have their opinion considered in the evaluation (77.8%); the is feeling safe when using the orthosis (83.3%), especially those in the lower limbs, and the perception that the use of orthosis did not cause embarrassment for the child (83.3%).

Fifteen caregivers (83.3%) said they had no difficulty in removing and placing the orthosis. However, three caregivers reported difficulty in handling the orthosis, and two of them (P6 and P8) pointed out that this difficulty was related to the spasticity presented by the children, who had severe spastic quadriparesis.

Another factor that influenced the satisfaction of the caregivers was the perception of improvement with the use of the orthosis, in which 77.8% of the caregivers reported improvement in the flexion pattern of the wrist and fingers, and greater confidence and balance of the child when walking. The appearance of the orthosis was evaluated positively by 77.8% of the caregivers, reporting that there are several options of models in the market with diverse prints and colors, which makes it attractive for children. Also, they reported that children have the opportunity to choose the pattern to customize the orthosis, especially in the lower limbs. Regarding the aesthetics of the orthosis, 22.2% of the caregivers reported that the use of velcro for its fixation is not

Table 2. Data related to children with CP.

Variables	Value	Frequency	n(%)
Gender	Female	7	38.9%
	Male	11	61.1%
Age	Up to 1 year old	1	5.6%
	2 to 5 years old	9	50%
	6 to 10 years old	6	33.3%
	11 to 15 years old	2	11.1%
Topographic impairment	Quadriparesis	10	55.6%
	Paresis	4	22.2%
	Hemiparesis	4	22.2%
LL Orthoses	Ankle Foot Orthoses (AFO)	17	94.4%
UL Orthoses	Ventral static orthoses for resting, thumb abductor	11	61.1%

LL = Lower Limbs; UL = Upper Limbs. Source: Created by the authors.

adequate since, for them, the velcro sticker hampers to clean the orthosis.

The data in Table 5 also suggest that the dissatisfaction with the use of the orthosis was because the children did not like to use it (61.1%). Seven of these children used upper and lower limb orthoses and four children used only lower limb orthoses. The caregivers reported that they had the perception of this fact by the children crying when placing the orthosis, by the request to the caregiver to remove it or even when they remove it alone. In their perception, the reasons were discomfort, pain, weight of the orthosis, especially of the lower limbs, and the heat transmitted by the orthosis (they perceived that the orthosis "overheats" too much).

The fact that the orthosis impairs the performance of activities was another factor of dissatisfaction in 50% of the caregivers. For these caregivers, playing activities were the most impaired, especially for children who used upper limb orthoses (ventral static for resting and thumb abductor) who reported that orthoses caused movement limitation and impaired toy handling.

Table 3. Professionals who prescribe the orthoses and time of use.

Professionals who prescribe it	Frequency	n(%)
Physiotherapist	11	61.1%
Occupational Therapist	4	22.2%
Orthopaedist	3	16.7%
Time they use it	**Frequency**	**n(%)**
More than 30 days	2	11.1%
Between 6 months and 1 year	2	11.1%
Between 1 and 2 years	7	38.9%
More than 2 years	7	38.9%
Total	**18**	**100%**

Source: Created by the authors.

Table 4. Knowledge about the function of orthoses.

	Frequency	n(%)	Statements
Knowing	17	94.4%	To leave the hand open, tighten the nerves and not let the wrist flex (47.5%). To correct the feet, avoiding deformities (53.4%) To maintain the correct foot and hand position (5.9%)
Not knowing	1	5.6%	I don´t know
Total	**18**	**100%**	

Source: Created by the authors.

Table 5. Frequency of the aspects mentioned in the categories of personal, aesthetic and emotional factors related to the use of orthoses.

Personal Factors	Yes n (%)	No n (%)
Get advice on how to use of orthosis	14 (77.8%)	4 (22.2%)
Periodic evaluations by the professional	18 (100%)	0
Opinion considered on the orthoses	14 (77.8%)	4 (22.2%)
Culture and religion prohibit orthoses	0	18 (100%)
The time of using the orthosis is very long	4 (22.2%)	14 (77.8%)
I always put the orthosis on my son	16 (88.9%)	2 (11.1%)
Difficulty in removing and putting on the orthosis	3 (16.7%)	15 (83.3%)
The child likes to use the orthosis	7 (38.9%)	11 (61.1%)
The child adapted with the orthosis	11 (61.1%)	7 (38.9%)
The orthosis impairs the performance of activities	9 (50%)	9 (50%)
I perceive improvement with the use of the orthosis	14 (77.8%)	4 (22.2%)
Aesthetics Factors	**Yes n (%)**	**No n (%)**
I like the appearance of the orthosis	14 (77.8%)	4 (22.2%)
Emotional Factors	**Yes n (%)**	**No n (%)**
Satisfaction to see the child using the orthosis	14 (77.8%)	4 (22.2%)
The child feels secure with the orthosis	15 (83.3%)	3 (16.7%)
The use of orthosis causes embarrassment	3 (16.7%)	15 (83.3%)

Source: Created by the authors.

4 Discussion

Most of the caregivers (77.8%) in this study were mothers of children with CP. This result is probably related to the consanguineous relationship and the female provision in the care of the family (MIRANDA, 2013). More recently, in an integrative review of the literature, the authors identified that mothers were still the main people involved in the care process, being an absolute majority in all studies analyzed (MACEDO, 2015).

Regarding the school level, most of the caregivers had finished High School (61.1%), and only two caregivers finished Higher Education. The family income of most of the caregivers (61.1%) varied between one and two minimum wages. Considering the data found in this study, there are impacts on the daily life of the caregivers, who often give up their studies and formal work to dedicate to the care provided to the disabled child, which may interfere in the low family income. Some studies have identified that one of the main challenges for the caregiver is to effectively deal with the problems of the child with CP and to reconcile this task with the demands of everyday life (MOBARAK et al., 2000; RAINA et al., 2005).

Regarding the children of this study, the predominance of spasticity characterized by quadriparesis, paresis, and hemiparesis was observed. This finding is related to the international literature, showing that the spastic form of CP is the most frequent of all and can be subdivided into hemiparesis, paresis, and quadriparesis (ODDING; ROEBROECK; STAM, 2006; RAINA; RAZDAN; NANDA, 2011). Brazilian studies have found similar results to international studies. Data on the epidemiological profile of children with CP assisted in an outpatient clinic in the city of São Paulo found a higher frequency of spastic type (CARAVIELLO; CASSEFO; CHAMLIAN, 2006). The same occurred in a study carried out in the city of Recife (COSTA; COSTA; PEREIRA, 2007) and in the city of Ribeirão Preto (PFEIFER et al., 2009).

It was verified that 94.4% of the children used Ankle Foot Orthoses (AFO), in which 55% (10) of them also used upper limb orthosis and only one child used only upper limb orthosis. Most children use LL and UL orthoses because of the clinical picture of the children in this study. In the total of children, 55% had quadriparesis, 22.2% had hemiparesis and 22.2% had paresis. Upper and lower limb orthoses are usually indicated to CP quadriparesis and hemiparesis. However, for children with paresis CP, although they have motor impairment in the upper limbs, the impairment predominance is in the lower limbs, which justifies the most common indication orthosis for LL. According to Roque et al. (2012), orthoses for LL are frequently used by children with spastic CP paresis to provide functional improvement of orthostatic posture and gait.

The results showed that the Physical Therapy and Occupational Therapy professionals predominated in the prescription and indication of the orthoses. Both professionals are qualified to perform these duties. According to Portaria SAS/MS Nº 661, dated December 2, 2010 (BRASIL, 2010), the prescription of orthoses, prostheses and special materials is included in the Brazilian Occupational Classification (CBO) of physiotherapists and occupational therapists.

From the perspective of the caregiver, most orthoses were prescribed by physiotherapists (61.1%). This data may be related to the fact that most of the children (94.5%) in this study use LL orthoses. Although these orthoses may also have been indicated by occupational therapists together with physiotherapists who provided assistance to the children, the caregiver attributed its indication more to the physiotherapist than to the occupational because they are orthoses related to improve the orthostatic posture and gait.

The fact that most caregivers (94.4%) know about the function of orthoses suggests that they were guided by the professionals who prescribed them. Guidance regarding the functional aspects of the orthoses may favor usability and impact on the user and/or caregiver satisfaction. Galvão Filho (2009) emphasized that the process of implementation of AT resources requires the participation and listening of all the actors involved with its use, otherwise, it increases the chance of abandonment with little time of its use.

According to Table 4, only one participant (P3) reported not knowing the function of the orthosis. This participant was the child´s grandmother with a CP. According to informal reports, she had the custody of the child about two months ago because the child was removed from living with the biological parents by court decision. Since then, both have had no further contact with the child´s parents. Thus, she was not able to inform the function of the orthosis used by her grandson. This data suggests the importance of professionals who have prescribed orthoses to be aware of the dynamics and family context in which the child under their care is inserted to guide the primary caregiver more effectively about the orthoses and others procedures.

Most participants (77, 8%) reported receiving different guidelines from the professionals on the use of the orthoses. When parents perceive the improvement in function and understand the importance of using the orthosis, the probability of adhesion is greater, intensifying the benefits offered by it (EDELSTEIN; BRUCKNER, 2006).

All the participants mentioned that the professionals evaluated the orthoses periodically. This data suggests that the follow-up and the attention of the professionals may have had a positive impact on the satisfaction feeling explained by most of the participants of this study. Rodrigues, Cavalcanti and Galvão (2007b) emphasized the importance of periodic and meticulous follow-up through reassessment, since the evolution of the clinical picture of the orthosis user may require modification of the device or its removal.

Although most of the caregivers (22.2%) reported that they did not have their opinion considered during the orthosis selection process, this is an important result and cannot be neglected. The involvement of the family in the process of intervention directed to the child and the welcoming listening of the professionals for the feelings and opinions of the caregiver need to be treated as an integral part of any care for children with disabilities (BALEOTTI; OMOTE; GREGORUTTI, 2015). Moreover, of abandonment causes of the use of AT devices reported in the literature are related such as the lack of user participation in the choice of the equipment, among other factors (VERZA et al., 2006). Theuser´s opinion during the selection of the orthosis is a motivating aspect for its adhesion (GARROS; GAGLIARDI; GUZZO, 2010).

Regarding the time using the orthosis, 77.8% of the participants reported that the time was not long and that they did not consider this aspect as a problem. This is an important fact because it seems that for the participants of this study the time delimited to use the device is not a factor that negatively affects their acceptance and adherence.

Three caregivers (16.7%) reported having difficulty in handling the orthosis for its placement and removal. Two caregivers (P6 and P8) attributed such difficulty to the spasticity that the children presented due to severe spastic quadriparesis. A similar justification was found in a study by Radtka, Skinner and Johanson (2005), who pointed out that the muscular rigidity, spasticity, and shortening presented by children with CP decrease joint amplitude, leading to difficulty in the orthosis placement. Studies carried out with caregivers of children with CP have reinforced the need for health professionals to rethink how often the guidelines are necessary for the correct placement of the orthosis by the caregiver, considering that many of them had difficulties for the performance of this task (OLIVEIRA et al., 2010).

Eleven caregivers (61.1%) reported that children did not like using orthoses for different reasons, mainly because orthoses cause pain, discomfort, they “overheat” and they are heavy. The literature indicates data similar to those found in this study. Orthosis users reported that dissatisfaction was related its high weight, with the sensation of excessive heat in the limb, pain pictures and/or occurrence of pressure sores (MATTOZO, 2016).

In this sense, the search for alternative and innovative materials that may be workable for the manufacture of orthoses becomes relevant. The use of 3D printing orthoses or other assistive devices has been shown to be a promising and effective alternative, addressing issues related to comfort and adjustments, adequate ventilation, weight reduction, and cost reduction compared to traditional materials (GANESAN et al., 2016). A prototype of ventral static orthoses for resting in 3D printing designed based on the identification of user requirements reported in the literature, allowed weight reduction by 20% compared to low-temperature thermoplastic orthoses, and openings in the region of the forearm for ventilation and cooling of the limb (BALEOTTI; MEDOLA; RODRIGUES, 2018).

For 50% of the participants, the orthosis hampered the performance of activities and playing was the most impaired activity for them. These data are very relevant and imply the need for professionals who are responsible for the prescription of orthoses to be aware of this fact. Playing is an important and fundamental occupation in the lives of children. Being the main occupation of childhood (ASSOCIATION..., 1996), it cannot be harmed by the use of orthosis, which are also fundamental for the rehabilitation of the children with motor problems. It is necessary to reflect on this issue and to think about the viability of models of orthoses that are functional and, above all, that do not limit something so important for the development of children, as playing.

The impact of the orthosis use on the performance of functional tasks by children with cerebral palsy has been the topic of discussion. The literature has reported that the use of thumb abduction in a child with hemiparesis CP improves the range of motion of the wrist and thumb. However, as far as manual function is concerned, although the orthosis reduces the time to perform tasks, this time is not significant, except for the task of stacking blocks (RODRIGUES et al., 2007a).

The results found in this study and in the literature recommended large and well-controlled studies, considering several variables that may be related to the functionality of different types of orthoses in the performance of the most varied daily activities developed by children with cerebral palsy.

They also refer to the need for investment in interdisciplinary research, with a proposal for collaborative design and the participation of professionals from different areas who want improvements in assistive technology products and improvement in the quality of life of their users (MACÁRIO, 2015).

Regarding the appearance of the orthosis (*aesthetic factor*), 77.8% of caregivers reported that they liked its appearance. The aesthetic aspect should be valued since it plays an important role in the acceptance and satisfaction of the user, and it is an even more relevant aspect for AT resources intended for children. Waldron and Layton (2008) pointed out that the opportunity for the user to choose the assistive devices and their customization are factors that contribute to its adherence.

The use of velcro was considered inadequate by some caregivers since for them, the velcro sticker hampers to clean the orthosis. This data suggests the need for the search for diversified materials to fix the orthosis instead of the velcro. This may facilitate hygiene and, consequently, user satisfaction.

Regarding the *emotional factors* that may be related to the use of orthoses, the results of this study indicate that 77.8% of the caregivers felt satisfied when seeing the children using the orthosis. Most of them (83.3%) reported that the use of the orthosis did not cause embarrassment. The minority (16.7%) mentioned feeling embarrassed by the people looking at the child and curious with questions such as: what is it? Why does he use it? However, it the literature described that many people who use AT devices are ashamed, as the device is often seen as a symbol of disability and diminished self-image (VERZA et al., 2006).

For 83.3% of caregivers, the child felt safe with the orthosis, especially in the lower limbs. Studies performed with children with CP using orthoses showed that these children had better performance in the qualitative aspects of gait when with orthoses than without orthoses, considering that the orthosis guarantees greater stability and safety in the support phase (ROQUE et al., 2012; CURY et al., 2006; SCHWARTZMAN, 2004).

5 Conclusion

This study is part of a more comprehensive project that aims to investigate the opinion and satisfaction of caregivers, children, and adolescents about the use of different AT resources.

In this part of the study, the perception of caregivers about the orthoses used by children with CP was presented. The results showed that the participants were satisfied with the use of the orthoses, a fact related to the follow up by the professionals who prescribed it and with the guidelines on its function.

The negative aspects were present because the caregivers perceived that the orthoses caused pain, discomfort and that the material used caused excessive heat in the body part. Also, they found that upper limb orthosis impaired the functionality in areas of children's occupations, such as playing activities. Thus, professionals need to closely monitor the usability of orthosis, since the negative aspects observed may influence the adherence of the children and their caregivers.

Despite the limitations of this study by the number of participants and the generalization of the sample results, important results were evidenced that point out the need for the health professional to consider the opinion of the user and/or the caregiver when prescribing a orthosis. Their opinion, positive or negative, may exert an influence on their use.

From this perspective, future studies that seek to understand the relationship between the type of orthosis used and the functionality of the child with CP in areas of childhood-specific occupations are suggested. Also, investigations that seek to collect data about the multiple variables involved in the use of orthotics and other AT devices used by children and adults are proposed. Finally, investing in research that prioritizes user requirements for the development of orthosis projects is also suggested, to improve satisfaction and consequently impact on the usability of this device.

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