

Use of assistive devices by individuals with hands osteoarthritis¹

Patrícia da Silva Santos^a, Núbia Isabela Macêdo Martins^a, Valéria Moura Moreira Leite^b,
Danielle Carneiro de Menezes Sanguinetti^b, Lilian Karla Porto Amorim Paixão^a,
Cláudia Diniz Lopes Marques^a, Daniela Salgado Amaral^b

^aUniversidade Federal de Pernambuco – UFPE, Recife, PE, Brazil.

^bDepartamento de Terapia Ocupacional, Universidade Federal de Pernambuco – UFPE, Recife, PE, Brazil.

Abstract: Introduction: Hands osteoarthritis is a joint disease that causes pain, stiffness, deformity, and loss of mobility. It has huge functional and negative impact on people's quality of life by making the common daily activities difficult and painful. Assistive devices are strategies used by occupational therapists for the symptomatic treatment hands osteoarthritis. Objective: To identify and describe assistive devices indicated for individuals with hands osteoarthritis through an Occupational Therapy intervention. Method: A Cross-sectional study, conducted on subjects diagnosed with hands osteoarthritis in an Occupational Therapy clinic at a reference hospital in the state, from August to September 2015. Sixteen participants answered a researcher-developed semi-structured questionnaire, focusing on the description and frequency of use of specified assistive devices. Data were analyzed using descriptive statistics through a measure of central tendency and probability distribution. Results: The assistive devices used in the daily lives of the 16 individuals interviewed were: adapters for dressing, adapters for bathing, peelers, thickeners, jar/bottle openers, and cutters. were in the routine of individuals 84% of these assistive devices with a daily, weekly and monthly frequency. Conclusion: In this study, individuals suffering from hand osteoarthritis used adapters for dressing, adapters for bathing, thickeners, peelers, jar/bottle openers and cutters as assistive devices.

Keywords: *Assistive Devices, Assistive Technology, Hand, Osteoarthritis, Occupational Therapy.*

Uso de dispositivos de assistência por indivíduo com osteoartrite de mãos

Resumo: Introdução: A osteoartrite de mãos é uma doença articular que acarreta dor, rigidez, deformidade e perda da mobilidade, gerando grande impacto funcional na vida das pessoas, por tornar as atividades comuns do dia a dia difíceis e dolorosas, repercutindo negativamente na sua qualidade de vida. Dispositivos de assistência são estratégias utilizadas por terapeutas ocupacionais para o tratamento sintomático da osteoartrite de mãos. Objetivo: Identificar e descrever dispositivos de assistência indicados para indivíduos com osteoartrite de mãos a partir de uma intervenção do terapeuta ocupacional. Método: Estudo observacional, descritivo de corte transversal. Realizado em população diagnosticada com Osteoartrite de mãos, no ambulatório de terapia ocupacional de um hospital referência, no período de agosto a setembro de 2015. Dezesesseis participantes responderam a um questionário semiestruturado elaborado com enfoque na descrição e frequência de uso dos dispositivos de assistência indicados e ofertados em uma pesquisa mestre. A análise de dados ocorreu por estatística descritiva através de medida de tendência central e distribuição de probabilidade. Resultados: Os dispositivos de assistência utilizados no dia a dia dos 16 indivíduos entrevistados foram adaptadores para o vestir, adaptadores para o banho, descascadores, engrossadores, abridores e cortadores. Foram incluídos na rotina dos participantes 84% destes dispositivos de assistência com frequência diária, semanal e mensal. Conclusão: Os dispositivos de assistência utilizados pela população estudada foram adaptadores para o vestir, adaptadores para o banho, descascadores, engrossadores, abridores e cortadores.

Palavras-chave: *Dispositivos Assistivos, Tecnologia Assistiva, Mão, Osteoartrite, Terapia Ocupacional.*

1 Introduction

Hands Osteoarthritis (HOA) is a prevalent joint disease in the elderly female that causes pain, stiffness, deformity, and loss of mobility (CONAGHAN et al., 2008; ZHANG et al., 2002). This disease generates a great functional impact on people's lives, making daily activities difficult and painful, especially those that require fine hand motility (CONAGHAN et al., 2008). Besides to the physical aspect, other domains have significant repercussions on the individual's life, such as social, financial and work, relationships, emotional and appearance factors (HILL; DZIEDZIC; ONG, 2010). For Kwok et al. (2010), these factors influence the limitation of activities of daily living, causing a reduction of the quality of life in subjects with HOA.

The combination of drug and non-drug treatment is necessary to reduce the symptoms in the subject. The American College of Rheumatology recommends the occupational therapist among the non-drug therapies as a professional trained to care for people with HOA, with the goal of favoring the daily activities (HOCHBERG et al., 2012). Given the intervention strategies, the prescription, preparation, and training of the use of care devices are commonly used in the occupational therapist's clinical practice, with the objective of improving manual function, protecting and avoiding joint wear (CAVALCANTI; GALVÃO, 2007).

Assistive devices are Assistive Technology resources that seek to favor the functional abilities of the person with a disability or limitation, so they can perform the activity or activities they had complaints or did not perform (BRASIL, 2009). A device may be simple, considered low-tech, such as a pencil thickener to facilitate grip during writing, or it can be complex, considered high-tech, such as a home automation system. These devices can be categorized into adaptations for care and personal hygiene, clothing, food, communication and management of domestic activities (CAVALCANTI; GALVÃO, 2007).

Current studies reveal positive answers regarding the use of care devices by people with HOA, but most of them address the use of assistive devices associated with other intervention strategies (HILL; DZIEDZIC; ONG, 2010; KJEKEN et al., 2011). Kjekken et al. (2011). In his research, Kjekken et al. (2011) detected that the use of assistive device associated with the use of orthosis in patients with HOA improves the manual function in

the accomplishment of activities, as well as the satisfaction of the individual. Recently, a Brazilian study focusing on the types of orthoses prescribed by occupational therapists in some regions of the country was published for cases of people with HOA of their thumbs (ALMEIDA et al., 2016).

However, there are few scientific productions in Brazil that describe rheumatic care devices in the hands, and the percentage becomes even smaller when it is directed to HOA, most of them for rheumatoid arthritis (NOORDHOEK; BARBOSA, 2006; NOORDHOEK; FERREIRA, 2008; NOORDHOEK; LOSCHIAVO, 2006; NOORDHOEK; TORQUETTI, 2007, 2008).

It is known that individuals with HOA are a people in the clinic of occupational therapy, the use of assistive devices is commonly indicated by these professionals and that there is still few scientific research in the area. Thus, this study aims to identify and describe the assistive devices indicated for individuals with HOA and their frequency of use from the intervention of occupational therapy. The relevance of this study is expressed in the strengthening of intervention strategies to improve the occupational performance and quality of life of these patients and in the provision of important subsidies for the development of science in this field.

2 Method

This is an observational, descriptive, cross-sectional study performed at the Occupational Therapy Outpatient Clinic of the Hospital das Clínicas at the Federal University of Pernambuco (HC/UFPE), in the city of Recife. Data were collected from August to September 2015, under the approval of the Ethics and Research Committee on Human Beings, of the Health Sciences Center of UFPE, in accordance with Resolution 466/12 of the National Health Council (CNS), CAAE 46548815.9.0000.5208.

The population of this study was the experimental group of the master research titled: "Assistive devices as a non-pharmacological treatment for hands osteoarthritis", performed between 2014 and 2015 by an occupational therapist at HC/UFPE. In the master survey, the experimental group received guidelines for joint protection and conservation of energy focused on the use of assistive devices after the evaluation, and also indicated and granted about 9 assistive devices. The criterion for their delivery was based on the needs reported by the patient and assessed by the therapist, with no limit to the

grant. Patients were involved in the prescription and choice of devices, trained to use them properly and encouraged to effectively include them in the daily routine.

For this study, the population was selected according to the following inclusion criteria: to have participated in the experimental group of the master research for at least 1 month and to have assistive devices delivered in the interventions. The exclusion criterion was to have presented more than 25% lack in the experimental group. The population was estimated in 19 participants, the total number of individuals in the experimental group. The confidentiality and consent of the interview were ensured by the presentation, clarifications, and signing of the Informed Consent Term (TCLE).

Participants answered a semi-structured questionnaire elaborated by the researcher containing questions about their sociodemographic profile, such as age, gender, address and education level, dividing them into literate and non-literate, considering those literate who had at least complete elementary education; clinical aspects of hand OA; occupational data related to the performance of productive activities after diagnosis.

The evaluation of the frequency of daily use of the devices was associated with the images of the devices in the questionnaire linked to the following possible answers: I did not use it, I used it only once daily (5-7 days a week), weekly (1-4 days of the week) and monthly (at least once a month). In this study, care devices were included in the routine when the frequency of use was classified as daily, weekly or monthly. Participants were also questioned about the sense of independence provided by such equipment and environments of use; and if they would indicate the use of the devices for others who have hands OA.

The classifications of the activities of this study are based on the Canadian Occupational Performance Measurement (COPM); (personal care, functional mobility and independence outside their home), productivity (paid and unpaid work, household chores and play/school) and leisure (quiet recreation, active recreation and socialization) (MAGALHÃES et al., 2009).

The data was stored in Microsoft Excel for Windows program spreadsheets. The descriptive statistic was used for the analysis of the data by measuring the central tendency (mean) and probability distribution (absolute and relative frequency), with a description of the observed aspects.

3 Results

There were nineteen individuals invited to participate in the study. However, three of them refused to participate because they were not present at the interview times. Thus, the population was composed of 16 individuals, all female, 56.3% elderly, 68.7% diagnosed with hands OA for more than 10 years (Table 1).

According to this study, the assistive devices indicated from an occupational therapy intervention were the adapter for dressing (1 type), the adapter for bath (1 type), the peelers (2 types), the thickeners (2 types), the openers (6 types) and the cutters (2 types), featuring 14 different types of assistive devices, where each participant received an average of 9 assistive devices, totaling 144 indicated and offered devices. They are related to the self-care areas (clothing adapter and bath adapter), represented by 16.6% of devices, and to productivity (peelers, thickeners, openers, and cutters) with 83.3% of the devices described in Table 2.

Regarding the frequencies of use of assistive devices, 84% of the 144 devices were included in the routine of the interviewees during self-care and productivity activities. Of them, 45.1% were used daily, 31.2% weekly and 7.6% monthly. There were 9.7% of the delivery devices not used, and 6.2% were used only once. The time of diagnosis was not significantly related to the greater adherence to the devices and the study population. Individually, only

Table 1. General characterization of the study population.

VARIABLE	N	%
AGE		
35-59	7	43.7
60-75	9	56.3
GENDER		
Female	16	100
LOCALIZATION		
Metropolitan region	13	81.3
State Interior	3	18.7
EDUCATION LEVEL		
Literate	15	93.7
Non-literate	1	6.3
DIAGNOSTIC TIME		
6 months - 9 years	5	31.2
10 months - 26 years	11	68.7
CURRENT OCCUPATION		
Housewife	11	68.7
Working	5	31.3

Table 2. Identification and description of the devices indicated by the occupational therapist.

Assistive devices	Description
	<p>SELF-CARE</p> <p>Adapter for bath: It helps individuals with difficulty in holding. It has an elongated handle to reach and adapt in proximal portion in the form of thickening, favoring the stabilization of the hand. Industrialized material, and the thickener is made with low cost material.</p>
	<p>Adapter for clothing: Device for difficulties in dexterity and manual coordination, besides being common use with only one member. One end allows for zipper handling and the other facilitates the use of a button. The thickened support for the hand favors joint grip and stabilization. Available in industrialized version and low cost material</p>
PRODUCTIVITY	
	<p>Thickeners: It is used in a variety of tools for greater finger grip and stabilization efficiency and/or tweezer movement. The main materials of the product are thermoplastics, rubber, polyethylene foam and microfoam, besides having diameters, shapes, light weights and differentiated textures that favor the adherence of the equipment by hand. The material can be industrialized or made from low cost material.</p>
	<p>Peeler: A device that seeks to facilitate the scraping of fruits and vegetables. It reduces the overload of stress generated in the interphalangeal joint, promoting stability and correct holding. They are available in several industrial models, for use through palmar or ring-shaped grip allocated in the interphalangeal joint.</p>
	<p>Cutter: The cutter decreases the stress overload generated at the interphalangeal joint, promoting stability and correct grip. They are available in vertical format, commonly known as pizza cutter, and horizontal format. They and other models of cutters are available in the industrial market.</p>
	<p>Opener: Openers are presented in varying shapes, sizes and handling, plus grips and stabilizations. They vary from the simplest, such as non-slip, multifunctional or even electric. They feature functions for caps, handles, canned, vacuumed utensils, or even pulls the handle of a door and faucet. They are usually available in the industry.</p>

one respondent did not adhere considerably to the devices in their day by day.

The most prevalent assistive devices daily used by the participants were: openers (multifunctional lid and pot and non-slip opener), thickeners (broom and pencil), bath adapter, vertical cutter and supported on interphalangeal peeler (Table 3).

All respondents stated they would indicate the use of the assistive devices received for other individuals with the same disease, but also all reported feeling more independent after using them, and 56.2% moved some devices to relatives' homes, food environments and work.

4 Discussion

The indication of assistive devices for patients with hands OA is frequent interventions in the clinical practice of the occupational therapist (YASUDA, 2005). In this research, the resources assisted the areas of performance of self-care and productivity, and it was suggested that the assistance devices were well accepted and incorporated into the routine of the population studied from the answers given regarding the feeling of independence, indication for other users and frequency of use.

According to Kjekken et al. (2005), the main occupational problems in the life of people with hands OA are in personal care and household chores. The dressing, preparing food, opening packaging, cleaning and writing is seen by the author in another study as the most deficient activities (KJEKEN et al., 2011). In this study, self-care was represented by adapters for bathing and dressing, while productivity

comprised cutters, peelers, thickeners, and openers, showing agreement with the aforementioned author.

The assistance devices have various construction features, as well as similarities in their objectives and in the way of use. They are materials of sizes, diameters, stabilizations, textures, weight, composition and diversified costs, when not manufactured they are adapted or even built by hand. Cruz and Toyoda (2008) classified the assistance devices according to the manufacturing method: 1) Devices made with alternative materials; 2) Devices purchased in stores of popular materials; 3) Mixed manufacturing device, a product with characteristics of alternative materials and materials purchased in stores.

In the market, there is currently a wide variety of assistive devices available that are increasingly attractive, affordable and priced at a variety of physical or virtual stores. These equipment aim to protect the structures and conserve energy of the body, favoring the minimum resistance, the less joint wear and the prevention of deformities, consequently avoiding painful processes and fatigue in the hands (BEASLEY, 2012). In this research, the devices used were originated from alternative materials or purchased from ready-to-use stores, as well as from mixed manufacturing.

The assistive devices allow multiple ways of holding them. When the holding diameter of an object is increased, the strength and joint disorder suffered by the hand is reduced (BEASLEY, 2012), and this situation happened in most of the devices present and accepted in this study. It is known that people with hands osteoarthritis often have difficulty in holding and gripping with resistance, with manual

Table 3. Frequency of use of assistive devices by respondents.

Assistive Devices	I do not use	I used it only once	Daily	Weekly	Monthly
Bath adapter			11		
Clothing adapter	2	3	3	4	1
Pencil Thickeners	1		5	4	2
Broom Thickeners	2	3	8	4	1
Peeler supported on interphalangeal	1		5	2	
Vertical peeler			4	5	
Vertical cutter			6	3	2
Horizontal cutter	1		1	3	
Multifunctional opener (4 functions)			4	7	1
Multifunctional opener (2 functions)			1	2	
Electric Opener	5	2	1	4	3
Multifunction lid and pot opener	2		7	3	1
Non-slip opener		1	9	4	
Total of devices	14 (9.7%)	9 (6.2%)	65 (45.1%)	45 (31.2%)	11 (7.6%)

function reduced by 60% (KJEKEN et al., 2005), since when grasping or tightening an everyday object, the hand with osteoarthritis undergoes instability, compromising a set of muscles, tissues and joints that assist in the movement (KALICHMAN; HERNÁNDEZ-MOLINA, 2010).

Noordhoek and Torquetti (2007) recommended the use of an adaptation to peel food to minimize the impact of the involvement of the carpometacarpal joint (rizartroze) on the manual function. The peeler promotes joint stability by gripping precisely with the palm of the hand, decreasing the demand for repetitive motions and thumb strength, shifting it to the larger and stronger joints of the wrist and elbow. In this research, it was detected that the peelers are among the devices most used in the routine of the individuals interviewed.

Regarding the frequency of use, there were 84% of the assistive devices in this study in the routine of the individuals. Of them, 45.1% were mostly used daily. Only one interviewee did not present considerable numbers of devices in their daily routine, which suggests a good acceptance by the participants, recognizing these devices as something that facilitates, helps, supports and improves their quality of life. These results are in line with the literature, in which individuals diagnosed with hands OA with impaired manual function recognize the devices as one of the most efficient strategies to improve performance in their daily activities (KJEKEN et al., 2013).

Openers, thickeners, bath adapters, cutters, and peelers were identified as the most used assistive devices in this study. These results are similar to the findings of Hill, Dziedzic and Ong (2010), where there are many problems related to the opening of plastic bottles, peeling fruits and vegetables and cutting food.

The multi-functional lid and pot openers and non-slip opener are shown to be more present in the frequency of daily use in this study, which may suggest the importance and usability of this resource. This information has been found in recent studies in the literature, such as Hill, Dziedzic and Ong (2010) e Kjecken et al. (2005), which revealed that such devices are of relevant importance for carrying out these basic day-to-day tasks, and when not implemented their impact is quickly detected. In addition, recognizing the importance of this function, scientists already point out which resource or ideal modification for the opening of packaging by this people, inserting them into the

product industry and that will be a social benefit (FLINN et al., 2013; HENSLER; HERREN; MARKS, 2015).

For Kjecken et al. (2011), the acquisition and use of Assistive Technology is an easily accessible self-management strategy for people with hands OA. The orientation of the occupational therapist becomes relevant because he is able to analyze the relationship between the use of the device and the difficulties brought about by the disease within the social and cultural contexts in which the individual is inserted, valuing his potentialities, reducing disabilities and avoiding feelings of frustration, in search of greater autonomy and independence (CAVALCANTI; GALVÃO, 2007).

Besides these factors and in order to manufacture, adapt or prescribe an assistive device, occupational therapists consider some items in their relationship with devices, such as safety provided with equipment use, simple and deductible design, adjustable size, cost, attractive and acceptable appearance for a certain age, comfort, easy application and removal, maintenance and hygiene (CAVALCANTI; GALVÃO, 2007). It is noteworthy that during the conduction of the master survey, the indications of the assistive devices were made by an occupational therapist, who considered the items previously mentioned for prescription of these technologies.

It is important to consider the feelings of independence in the answers of the entire population interviewed after the use of assistive devices, in view of the functional skills lost. The study by Hill, Dziedzic and Ong (2010) reports that individuals are no longer able to perform their activities, either to day-to-day activities, or those related to work, the perception of identity as independent is affected, causing feelings of dependence on instrumental, financial and emotional help.

Independence suggests greater social participation, when 56.2% of the respondents declare to transport the devices to other environments of their daily life, such as houses of relatives, food environments, and work. For Early (2005), this routine should be highly valued, as it establishes the individual's skills in their occupational performance and becomes a source of pride for those who previously experienced constant restrictions on participation at home, at work, in family and community life.

This study had the evaluation only after 30 days of use of the assistive devices by the patients as the main limitation. It is believed that a reevaluation after 90 days of follow-up would bring new possibilities for analysis and more efficient results

on the characteristics of the assistance devices studied. The small number of the sample can also be considered a limiting factor.

5 Conclusion

In this study, it was possible to detect that the most suitable types of assistive devices for the studied population were those related to self-care (bath and clothing adapters) and productivity (peelers, cutters, thickeners and tool openers), and the most used devices were the tool openers. Also, the inclusion of the use in the routine was relevant, being the frequency of daily use of the resources more indicated by the patients.

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Author's Contributions

Patrícia da Silva Santos wrote the article. Núbia Isabela Macêdo Martins collaborated with the reading and interpretation of international bibliographical references. The authors Valéria Moura Moreira Leite, Danielle Carneiro de Menezes Sanguinetti, Lilian Karla Porto Amorim Paixão and Cláudia Diniz Lopes Marques assisted in the review of the article. Daniela Salgado Amaral collaborated with the planning, discussion and correction of the article. All authors approved the final version of the text.

Notes

- ¹ Study carried out at the Hospital das Clínicas of Pernambuco, under the approval of the Ethics and Research Committee on Human Beings, of the Health Sciences Center of the Federal University of Pernambuco, according to Resolution 466/12 of the National Health Council (CNS), CAAE 46548815.9.0000.5208.