

**PROFILE OF PROFESSIONAL PRACTICE AND SCIENTIFIC PRODUCTION OF OCCUPATIONAL THERAPY ON THE ASSISTIVE TECHNOLOGY IN BRAZIL****PERFIL DA PRÁTICA PROFISSIONAL E PRODUÇÃO CIENTÍFICA DA TERAPIA OCUPACIONAL REFERENTE À TECNOLOGIA ASSISTIVA NO BRASIL****PERFIL DE PRÁCTICA PROFESIONAL Y LA PRODUCCIÓN CIENTÍFICA DE LA TERAPIA OCUPACIONAL EN LA TECNOLOGÍA ASISTIVA EN BRASIL**

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This paper is an exploratory research, which aims to do an integrative review of published articles on databases from 2000 to 2013 by occupational therapists addressing the application of Assistive Technology (TA). And yet, we applied a semi-structured questionnaire to professionals working in the city of Curitiba/PR, Brazil. The analysis of the data obtained was performed seeking to integrate the information of both surveys. The results showed points in which literature and clinical practice corroborate each other, for example, both of them have highlighted children as an object of study and as the population that most demands the use of TA devices. It was concluded the importance of knowing the reality experienced by Occupational Therapy professionals who work in the area, enabling the vision of the clinical practice of the profession with regard to the use of these resources in the most varied contexts, demands and customer type.

**Descriptors:** Occupational therapy; Self-Help devices; Professional practice.

Este trabalho trata-se de uma pesquisa exploratória, na qual tem como objetivo fazer uma revisão integrativa em bases de dados sobre artigos publicados no período de 2000 a 2013 por terapeutas ocupacionais abordando a aplicação da Tecnologia Assistiva. E, ainda, aplicou-se de um questionário semiestruturado aos profissionais atuantes na cidade de Curitiba/PR. A análise dos dados obtidos foi realizada buscando integrar as informações de ambas as pesquisas. Os resultados obtidos apresentaram pontos em que literatura e prática clínica corroboram entre si, por exemplo, ambos destacaram as crianças, tanto como objeto de estudo, quanto como a população que mais demanda a utilização de dispositivos de TA. Concluiu-se a importância de se conhecer a realidade vivenciada pelos profissionais de Terapia Ocupacional que atuam na área, possibilitando a visão da prática clínica da profissão quanto à utilização destes recursos nos mais variados contextos, demandas e tipo de cliente.

**Descritores:** Terapia ocupacional; Equipamentos de autoajuda; Prática profissional.

Este artículo es una investigación exploratoria, en la cual se objetiva hacer una revisión integradora se celebró en bases de datos, con artículos publicados en el período comprendido entre 2000 y 2013 por terapeutas ocupacionales abordando la aplicación de tecnología asistencial (TA). Además, hice la aplicación de un cuestionario semiestruturado a profesionales en la ciudad de Curitiba/PR, Brasil. El análisis de los datos obtenidos se realizó buscando integrar la información de ambas encuestas. Los resultados obtenidos mostraron puntos en que la literatura y la práctica clínica se apoyan entre sí, por ejemplo, ambos tienen hijos, como objeto de estudio y la población que más demandan el uso de todos los dispositivos. Se concluyó la importancia de conocer la realidad vivida por los practicantes de terapia ocupacional que trabajan en el área, lo que permite la visión de la práctica clínica de la profesión con respecto al uso de estos recursos en los más variados contextos, demandas y tipo de cliente.

**Descritores:** Terapia ocupacional; Dispositivos de autoayuda; Práctica profesional.

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## INTRODUCTION

There are several terminologies used in Brazil to define what the technological resources are: Assistive Technology (USA), Assistance Technology (CIF/WHO) and Support Technology (European Committee/EUSTAT) and Technical Assistance (Brazilian Ministry of Health)<sup>1</sup>.

Brazilian law uses the term Technical aids as a synonym for Assistive Technology, which is described in Art.19 of Decree 3296 of December 1999, as the features that compensate one or more motor, sensory or mental functional limitations of the disabled person, in order to allow them to overcome the barriers of communication and mobility and to enable their full social inclusion<sup>2</sup>.

This is a discipline that comprises areas of rehabilitation, computer and electrical engineers, biomedical, physicians, architects, occupational therapists, physiotherapists, speech therapists and industrial designers who work to restore human function using assistive devices<sup>3</sup>.

According to the IBGE Census 2010, there are in Brazil about 45.6 million Brazilians who have a disability, totaling 23.9% of Brazilians. Because of this significant number, it was launched in November 17, 2011, through Decree No. 7612, the *Plano Nacional dos Direitos da Pessoa com Deficiência – Viver sem Limites* (National Plan of the Rights of People with Disabilities - Living without Limits). The Secretariat of Human Rights of the Presidency in conjunction with other Federal Government agencies coordinate the Living without Limits plan, which aims to implement and intensify actions for the benefit of people with disabilities and thus it aims to improve the citizens' access to their rights, such as education, transportation, work, professional training, housing and health<sup>4</sup>.

Whereas the area of Assistive Technology is evolving constantly, with new products and new technologies, it is necessary to know how, what for and where this technology has been used among Occupational Therapy professionals in Brazil, and in a

qualitative manner, to know the application of this technology by these professionals in Curitiba/PR, who number, according update of CREFFITO 8 on November 27, 2013, 315 active occupational therapists in several areas of the profession<sup>5</sup>.

This study aims to make an integrative review on databases for articles published from 2000 to 2013 by occupational therapists addressing the application of Assistive Technology.

## METHOD

This is an exploratory integrative review. The review was conducted through electronic search of articles indexed in the databases (MEDLINE/PubMed, LILACS and SciELO), in which articles published in national journals from 2000 to 2013 by occupational therapists addressing the application of Assistive Technology in Brazil were selected.

Thus, we listed the keywords "Occupational Therapy and Assistive Technology", "Adaptations and Occupational Therapy" "Adaptation and Assistive Technology" and "Technical Aids and Occupational Therapy", located both in the title, as in the text.

The sample used the following inclusion criteria: I) language of publication - articles published entirely in Portuguese, English and Spanish; II) year of publication - articles published from 2000 to 2013, comprising a period of 13 years; III) types of scientific production - all types of research were included (research report, case study, work experience report and review studies).

After finding the articles, it was carried out analytical and comprehensive reading of each study. Thus, the articles reviewed were the primary sources of knowledge on the use of Assistive Technology by Occupational Therapists and we believe that by encompassing the three aforementioned databases we gathered the most relevant articles on the general theme.

For better organization and understanding, after examination of the master

guidelines of the results of each study, we performed tabulation of material distributed in nine predefined dimensions of analysis, namely: year of publication, indexing journal; author; federation unit of the research; design; studied technology; performance area of the application; object of study; and research publishing language.

The second part of the study deals with the analysis of questionnaires answered by 18 professionals who were part of this sample, of a total of 21 occupational therapists contacted. All were informed about the research and on voluntary participation after signing the Informed Consent Form.

This study it is a sub-project included in the survey entitled "Evaluation of patients with arm amputated after treatment of Occupational Therapy at the Worker's Hospital". This research was approved by the Worker's Hospital Ethics Committee, under opinion number 287,534 at 04/04/2013 and its Ethics Assessment Presentation Certificate number is 14060213.7.0000.52255.

## RESULTS

Through integrative review held in databases, it was possible to survey the scientific production of occupational therapists that mention Assistive Technology in their designs, whether they are: research report, professional experience report, case study and literature review. The articles were researched starting from four descriptors, "Occupational Therapy and Assistive Technology" (1) "Occupational Therapy and Adaptation" (2), "Occupational Therapy and Adaptations" (3) and "Occupational Therapy and Technical Aids" (4).

With the descriptor (1), 435 articles were found in MEDLINE/PubMed database, 16 in LILACS database, and none in SciELO database; with the descriptor (2), 978 articles were found in MEDLINE/PubMed, 24 in LILACS and one in SciELO; with the descriptor (3), 113 articles were found in MEDLINE/PubMed database, 7 Base in LILACS and none in SciELO; with the descriptor (4), it

found 130 articles only in MEDLINE/PubMed database, it is noteworthy that this latter descriptor it is the term used by the Ministry of Health of Brazil to refer to Assistive Technology.

Considering the inclusion criteria, in which the articles should be published in Brazilian journals, from 2000 to 2013, by occupational therapists addressing the application of AT in Brazil, in Portuguese, English or Spanish languages, the articles were then analyzed fully. Thus, among 1704 articles found, only 16 articles were selected and were found only in LILACS database, as follows: 13 articles with the descriptor "Occupational Therapy and Assistive Technology"; 2 articles with the descriptor "Occupational Therapy and adaptation"; and 1 article with the descriptor "Occupational Therapy and Adaptations".

With these 16 articles fitting in the methodology of this study, 15 of them in Portuguese and one in English, we started cataloging in Excel spreadsheet. It is noticed that articles published by occupational therapists addressing the use or study of AT in Brazil began in 2009, a year that presented two publications (12.5%); in the years 2010, 2011 and 2012 3 articles were found in each year (18.7% each); and in 2013, 5 articles were found (31.2%).

As to the analysis of the journals in which these 16 articles were published, we found six different journals: in *Caderno de Terapia Ocupacional da UFSCar* and *Revista de Terapia Ocupacional da Universidade de São Paulo* 6 articles were found (37.5%) in each of them; and in the *Revista Brasileira de Ciências da Saúde*, in the *Revista Latino Americana de Enfermagem*, in the *Revista Brasileira de Crescimento e Desenvolvimento Humano* and in the *Revista Ciência e Saúde Coletiva* 1 article was found (6.25%) in each of them.

The Federative Unit with the highest number of publications was the Southeast, where 13 articles (81.25%) were found, 9 in the state of São Paulo, 2 in the state of Rio de Janeiro and 2 in Minas Gerais. In the Northeast 2 articles (12.5%) were found, both in the state

of Rio Grande do Norte. In the South, we found only one article (6.25%), in Paraná. In the North and Midwest no publication was found.

Among the 16 selected articles, four different designs were found, namely: case study, in 8 articles (50%); followed by 3 articles (18.75%) each one, in research report, professional experience report and literature review, highlighting that one article could present two lines of designs.

Twelve different study objects were found (noting that one article can focus in more than an object of study): 4 articles (25%) addressing children who use AT, individuals with disabilities in three articles (18, 75%); students with disabilities, the role of the occupational therapist, the functionality of AT, and rehabilitation in two articles each (12.5%); the delivery process of wheelchair, children in hospital, scientific production, occupational therapist training, Paralympic athletes and individuals with hand paralysis, appear in one article each (6.25%).

Technologies studied were also evaluated. Fifteen were found, and the use of Argumentative and Alternative Communication (AAC) resources was the most frequently found, in 4 articles (25%); followed by school devices and writing devices in 3 articles (18.75%) each; the wheelchair, walking devices, personal care devices, accessibility, orthotics and prosthetics and home care were cited in 2 articles (12.5%) each; and low-cost adaptations, the use the toilet, the bath devices, food, work and postural positioning in one article (6.25%) each.

From the analysis of objects of study and studied technologies it was possible to establish the areas of human occupation that most use AT devices. The following areas were found: Activities of Daily Living (ADL), Instrumental Activities of Daily Living (IADL), Education and Leisure. It was concluded that ADL and IADL are the areas of occupation in which there is greater use of Assistive Technology resources and/or devices. The first is present in 10 articles (62.5%) and the

second in 9 articles (56.25%). Devices that enter the field of education were found in 4 articles (25%), and only 1 article in Leisure (6.25%).

As for the use of AT by occupational therapists from Curitiba/PR that were part of the study sample, the following actions were listed from the most used to the least used: prescription of devices, fabrication of devices, adaptation of tools, training the use of devices and adaptations in environments.

Regarding the materials used the following were arranged in ascending order of use: EVA; velcro; leather; plaster; thermoplastic; neoprene; PVC.; software; and jeans. Still on the use, other materials were indicated as used in practice, as the miracle fix, the cold porcelain clay (paste), the silicone, wood scraps, foam, synthetic gypsum and springs for traction.

Of the 18 professionals interviewed, all (100%) reported having as the main demand children as their clientele, 17 (94.44%) stated attending adolescents, and 15 (83.33%) stated attending adults and the elderly. They were questioned about the clients receptivity to the use of AT, and we found that high receptivity is placed as first option being scored 12 times (66.66%) by professionals, followed by little receptivity as the second option, and no receptivity as third option. With regard the areas of occupation for which most adaptations are manufactured, all (100%), occupational therapists who participated in the survey said they use adaptations that meet the needs of the ADL occupational area, 17 (94.44%) stated intervening with adaptations in education, followed by 14 (77.77%) in work, 13 (72.22%) mentioned leisure, 12 (66.66%) IADL and Social Participation and Sleep and Rest are the least cited areas, with 11 answers each (61.11%).

Regarding the limiting factors in the prescription of devices, it was realized that the most listed factor it is the lack of cooperation of the patient and the family, which was the only option cited by all 18 (100%) participants in the questionnaire, followed by high costs

and low accessibility, cited by 17 (%), the institution in which the therapist works, mentioned by 16 (%), and absence of product, gap in academic education and low quality products, cited by 15 (%).

As for the resources modalities, they were cited in ascending order of prescription: orthoses by 16 therapists (%), alternative communication and postural adaptation devices by 13 professionals (72.22%), electronic devices by 12 (%), adaptation of environment and adaptation of vehicles by 11 (61.11%), and prostheses by 10 therapists (%). About the length of time most suitable for using devices is the average time, proposed by 13 professionals (72.22%), since the long and short stay periods balance each other, and are mentioned by six professionals(33.33%), and eight professionals, each (44.44%).

Another knowable issue was in relation to the percentage of devices indicated by occupational therapists, which are available for public services. We verified 50% of responses in the percentage of 0-15% of available devices, being punctuated by nine professionals, followed by five answers stating that the government provides 16-30% (28% of respondents). The percentage 31-50% was mentioned by 3 people (17%), while there was no citation in the percentage 51-80% and finally, the availability of devices was 81-100% in only one answer (5%).

The last part of the questionnaire concerned the only open question about the use of AT, whether the professional could expose which pathologies and/or limitations most demand the use of resources in this technology. Results were varied as shown in Table 1 below.

**TABLE I.** Conditions that require the use of AT. Curitiba/PR. 2013.

Disease /condition /disability	References
Cerebral palsy	13
Neuromuscular diseases	7
Rheumatic diseases	7
Amputation	5
Spinal cord injury	5
Intellectual Disabilities	3
Syndromes	3
Stroke (Cerebral Vascular Accident)	3
DN	3
Tendinous injuries	3
Acquired brain injury	3
Neurological diseases	2
Stroke	2
Mild cognitive impairment (MCI)	2
Malformations and birth defects	2
Pervasive developmental disorder	2
Brain injury	2
Fractures	2
ADHD	1
Deformities resulting from trauma	1
Contractures	1
Hand injuries	1
Obesity	1
Diseases related to aging	1
Muscular dystrophy	1
Mental disability associated with physical disability	1
Orthopedic diseases	1
Postoperative	1

**DISCUSSION**

Through integrative review, we outlined the specificities of this profession regarding the use of assistive technologies, in which the Occupational Therapy professional performs a crucial role from beginning to the end of the process of prescription of a device. Even with the inclusion of sixteen articles that fit into this research, it was noticed a growing number of publications on the subject.

It is noteworthy that none of the interviewed professionals is author of the articles of this study. However, some data obtained from questionnaires corroborate what was found in the articles analyzed, for example, both highlighted the children as object of study, and as the population who most demands the use of AT devices.

Another aspect of the questionnaire that corroborates the scientific production is related to the most studied area of occupation and for which more devices are produced, which are the Activities of Daily Living (ADL).

Regarding the modalities of technologies most studied by the articles and by occupational therapists, there was agreement about the top three, but in a different order, with the orthoses as the modality most studied listed by the questionnaires, followed by postural adaptation devices and alternative communication devices, however, in the integrative review, the alternative communication devices were the most mentioned, followed by orthoses and postural adaptation devices.

It was found among professionals surveyed that the vast majority prescribes technologies and that few performs adaptation of environments, which that can be explained by the fact that occupational therapists have provide care to people who require technologies in the clinic environment, and do not perform home care, which would provide intervention in the environment.

It can be inferred that the most of the occupational therapists participating in this studied have not been developing and crafting adaptations in their everyday, but prefer to recommend their patients to purchase them.

It was noted the prevalence of low-cost materials, in manufacturing adaptations and little reference was made to the high-technology currently encouraged by the government.

In the literature, however, only one of the 16 articles that met the integrative review cited the use of such material. It was found that researches are focused on high-performance technologies, while professionals are still using low cost materials in practice.

Another point that was also relevant was regarding the wide acceptance of technology, and a limiting factor pointed out by the technicians was the lack of cooperation of the patient and the family. Perhaps it is

necessary even more propagation and clarification on these resources and their importance for the social inclusion of individuals, in an attempt to overcome environmental and also attitudinal barriers, still present in our society.

Thus, it appears that orthoses, since they are devices that are often part of rehabilitation, orthopedic, neurological and rheumatological protocols, are the most prescribed resources by occupational therapists. These features, in most cases, receive medium-term prescription, which may indicate that the demands and limitations of users are more temporary and not permanent.

It is noteworthy that, according to data from the questionnaires analyzed, the provision of technology by the Brazilian government is still far below of the goals of the programs presented such as the Living without Limits, and that the high cost and the difficulty of access are limiters for the use of these technologies by their patients. Given this, it is observed that the even though the Living without Limits plan has the objective of the supply of products, with the initiative of a virtual catalog, it has not been enough in providing technologies, as most of the technicians points out that these resources are not achieved in clinical practice by means of such government programs available.

## **CONCLUSION**

Profiling the scientific literature regarding Assistive Technology as a therapeutic resource of Occupational Therapy in Brazil in the 21<sup>st</sup> century was the central objective of this work, which triggered the need to know the reality of this practice by occupational therapists in Curitiba/PR for purposes of understanding and for purposes of comparison between the literature, scientific production and professional clinical practice.

The methods and techniques listed in this study enabled achieving the proposed objectives. However, it is worth mentioning the great difficulty found on the participation of professionals working in the city related to the

interview, even though this questionnaire was developed for the rapid filling. Still, it was observed that the scientific production of Occupational Therapy related to Assistive Technology is scarce in Brazil, but in constant growth, and subject of studies for deepening this issue.

It is seen, from this experience that the correlation between scientific production and clinical practice developed by the technicians is of great importance for the student who is interested in this area because it enables the vision of professional practice regarding the use of these resources in various contexts, demands and customer type.

It is also considered important the knowledge of how this practice has been developed by professionals of the field in Curitiba, because it enables reflection on the reality presented, considering that each city or region in Brazil, due to cultural factors and local, can present different demands and results of those obtained in this search.

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## CONTRIBUTIONS

**Géssica Cristina Conor and Angela Paula Simonelli** had equal contributions in the construction and final wording of article.