



THE EFFECTIVENESS OF ASSISTIVE DEVICES FOR ACTIVITY DAILY LIVING (ADL) AMONG PEOPLE WITH PHYSICAL DYSFUNCTION

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Abstract. Physical dysfunction can contribute to the loss of ability to perform daily task activities, intervention is needed to prevent this condition. This study aimed to determine the effect of Assistive Devices on occupational performance among people with Physical Dysfunction. The research subject is five people who experienced physical dysfunction due to illness or injury in May 2022. From an occupational therapist's perspective, data is obtained through observation, client intervention, and direct implementation of assistive devices. The subject will determine the goal of intervention on activities of daily living using a subjective perspective based on occupational performance and satisfaction score. The evaluation of the intervention in this study used Canadian Occupational Performance Measure (COPM). The results of this study showed an increase in performance and satisfaction scores of 1.6 (from 5.8 to 7.3) and an increase in satisfaction scores of 2 (from 5.4 to 7.4) in activity daily living skills. Other factors can affect the success of the intervention, nevertheless the use of Assistive Devices can encourage independence in daily activities among physical dysfunctions.

Keywords: physical dysfunction, occupational therapy, assistive devices, activities of daily living, disability.

1 Introduction

Dysfunction can be described as the loss of ability or the reduction in one's capacity to perform daily tasks. Physical dysfunction in adults may stem from a congenital defect or form a disease process or trauma experienced during childhood or adulthood. Conditions that precipitate physical dysfunction may be orthopaedic, neurological, arthritic, cardiac or respiratory in nature (Blight, 1990). Physical dysfunction is associated with client factors such as changes in body functions and/or structures. Most changes that vary from the normal tend to disrupt performance of occupation. For example, a wrist fracture, with its necessary casting and period of immobilization, causes problems in dressing, bathing, handling money, driving a car, caring for a child, and so on. Some activities cannot be done

independently while the cast is on (e.g., bathing an infant); others can be accomplished with modifications (e.g., donning a coat) (Patnaude, 2022).

Mental and physical disorders have a considerable impact on partial disability, at both the individual and at the societal level. Physical disorders yielded higher effects on partial disability than mental disorders (Bruffaerts et al., 2012). Persons with severe physical disabilities may not be able to perform many homemaking tasks without assistance, they can be effective home managers. For instance, individuals with high-level spinal cord injuries can independently manage household tasks by directing family members or paid housekeepers, managing finances, and overseeing shopping. Computerized banking systems and shopping services are accessible to those with Internet access and are relatively easy to use (Radomski & Latham, 2014).

The loss of any ability results in a sudden restriction in function, sensation and appearance. This can even lead to high levels of frustration due to unmet needs of the client (Josephine Dasel & Janet Punyit, 2014). Persons experiencing physical dysfunction cannot do the activities in the normal or customary way because of impairments in underlying abilities needed to perform the activities (Patnaude, 2022).

Occupational therapists are registered health practitioners who work with people to improve their health and wellbeing, with a focus on physical and mental health that may be related to a person's injury or illness, or to an accident or developmental impairment. The primary goal of occupational therapy is to enable people to participate in everyday life (NHWDS, 2018). Occupational Therapist utilize theory and models of practice to structure their thinking about practice situations. Some models of practice utilized in the practice of physical dysfunction include the model of human occupation, biomechanical approach, sensorimotor approach, and rehabilitation approach (Patnaude, 2022). One of the practice in occupational therapy is using Assistive devices.

Assistive devices is of fundamental importance for persons with permanent or temporary functional difficulties as it improves their functional ability, and enables and enhances their participation and inclusion in all domains of life (WHO, 2022). An assistive product is any external product (including devices, equipment, instruments or software), especially produced or generally available, the primary purpose of which is to maintain or improve an individual's functioning and independence, and thereby promote their well-being. Assistive products are also used to prevent impairments and secondary health conditions (WHO, 2022). Assistive Living Technology appears to impact perceived independence in many ways, exceeding merely the executional aspect of independence (van Dam et al., 2023). One of the reason for adapting activities is to enable a person with physical impairments to do an activity or task he or she would be unable to do otherwise. For example, after having a stroke that causes paresis of one upper limb, a patient can learn a new method of putting

on a shirt that requires only one hand. Or the environment in which a favourite activity was accomplished can be modified to allow engagement (Radomski & Latham, 2014).

Assistive devices can make many things easier for the person with a disability. Because they are easier, many things that were previously not worth the effort can become reasonable activities for a person with a disability. In the terminology of the disability model, assistive devices will never remove a functional limitation. However, it can prevent that functional limitation from resulting in a disability (Pendleton & Schultz-Krohn, 2018).

2 Method

The research was conducted using a quantitative descriptive method. The purpose of this descriptive study is to provide an overview of the effectiveness of using assistive devices for people with physical dysfunction. The research subjects were 5 people with physical dysfunction in Indonesia, both men and women aged over 20 years. The primary data obtained in this study used interviews, observation, direct measurements using the Canadian occupational performance measure and direct intervention on the subject

3 Result

There are stages of assessment carried out by occupational therapists before providing interventions using Assistive devices, as follows; identify the client's needs and goals, evaluate the client's capabilities and limitations, identify the need for assistive devices, conduct trials of assistive devices, until finally the assistive devices are used in daily activities.

We selected 5 people who had physical dysfunction to be subjects in this study (table 1.). The Assistive devices provided in the intervention have various uses in helping client, including; dressing, walking, eating, and working at the computer (Fig 1).

Table 1. Research Subject Profile

No. Subject	Sex	Age	Diagnosed	Assistive devices
1	Male	34	Post-Encephalitis Toxoplasma	Button Hook
2	Male	55	Non-Haemorrhagic Stroke - Hemiparesis Dextra	Universal Cuff
3	Male	59	Ischemic Stroke - Hemiparesis Dextra	Feeding Aids
4	Female	22	Spinal Muscular Atrophy	Typing tool

5	Female	65	Kyphosis	Mobility Aids
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Fig 1. Documentation of the use of assistive devices on clients

Canadian Occupational Performance Measure (COPM) instrument was used in this study to measure the effectiveness of interventions using assistive devices in physical dysfunction. COPM was chosen because it can identify a person's specific problems and evaluate performance and satisfaction.

The COPM results show that the intervention using assistive devices in the 5 client cases above experienced an increase in work performance with an average score of 1.6 (from 5.8 to 7.3), while the average increase in the level of satisfaction after using assistive devices was 2. (from 5.4 to 7.4). This shows that the use of assistive devices is effective in increasing client independence (table 2.)

Table 2. Evaluation result using COPM

Subject	Performance Before AT Intervention	Satisfaction Before AT Intervention	Performance After AT Intervention	Satisfaction After AT Intervention	Results Performance (after-before)	Results Satisfaction (after-before)
1	4.8	5	6.2	6.8	1.6	1.8
2	4.6	3.8	8.8	9	4.2	5.2
3	5.2	4.4	6.2	6	1	1.6
4	6.8	6	7.4	6.6	0.6	0.6
5	7.6	7.6	8.2	8.2	0.6	0.6
Average	5,8	5,4	7,36	7,4	1,6	2

4 Discussion

Assessment of client capabilities is the most important part that must be done before determining the type of tool to be given to clients. Occupational therapists can periodically evaluate sensory, physical, language, and psychosocial conditions found in clients. In line with research which states that progress in the use of technological tools must be monitored, and must be re-evaluated (Wissick & Gardner, 2008).

There are several factors that can cause obstacles in the use of assistive devices including knowledge of assistive devices, habits in the use and maintenance of assistive devices. This is in line with research which states that the biggest barrier to reluctant use of Assistive devices does not appear to be a problem of acceptance but rather a lack of knowledge about AT and where to get counselling (Fotteler et al., 2021).

COPM can be used in evaluating the effectiveness of assistive devices intervention. This is in accordance with previous studies which stated that COPM provides an opportunity for occupational therapists to use a reliable tool to set rehabilitation goals and plans in interprofessional teams (Caire et al., 2022).

Evaluation results using COPM related to the effectiveness of assistive devices show varying results, this can be influenced by the type of assistive devices and activities carried out by the client. However, the increase in the average score of job performance was 1.6 (from 5.8 to 7.3) and the average score of job satisfaction was 2 points. (from 5.4 to 7.4) indicates the effectiveness provided by the assistive devices. This is in line with previous research which stated that assistive devices can be a powerful strategy to support daily functions and facilitate client care (Moen & Østensjø, 2023).

5 Conclusion

Physical dysfunction can affect a person's level of independence, especially in daily functional activities such as self-care and work. Occupational therapy can intervene to improve client functionality, one of which is by intervening using assistive devices (AT).

In this study, there were 5 people with physical dysfunction with different diagnoses (stroke, post-encephalitis, spine, muscle atrophy, etc.) who were given interventional assistive devices by occupational therapist. Occupational therapist can provide assistive devices interventions according to the client's abilities.

The results of the intervention evaluated used the Canadian Occupational Performance Measure (COPM) showed an increase in performance and satisfaction scores of 1.6 (from 5.8 to 7.3) and an increase in satisfaction scores of 2 (from 5.4 to 7.4). Thus it can be seen that the use of assistive devices can increase the level of independence, especially in the performance and satisfaction of someone who experiences physical dysfunction.

References

1. Blight, M. (1990). The Role of Occupational Therapy in Adult Physical Dysfunction. *Canadian Journal of Occupational Therapy*, 57(5), 2–4. <https://doi.org/10.1177/000841749005700501>
2. Bruffaerts, R., Vilagut, G., Demyttenaere, K., Alonso, J., Alhamzawi, A., Andrade, L. H., Benjet, C., Bromet, E., Bunting, B., de Girolamo, G., Florescu, S., Gureje, O., Haro, J. M., He, Y., Hinkov, H., Hu, C., Karam, E. G., Lepine, J.-P., Levinson, D., ... Kessler, R. C. (2012). Role of common mental and physical disorders in partial disability around the world. *The British Journal of Psychiatry: The Journal of Mental Science*, 200(6), 454–461. <https://doi.org/10.1192/bjp.bp.111.097519>
3. Caire, J. M., Maurel-Techene, S., Letellier, T., Heiske, M., Warren, S., Schabaille, A., & Destruhaut, F. (2022). Canadian Occupational Performance Measure: Benefits and Limitations Highlighted Using the Delphi Method and Principal Component Analysis. *Occupational Therapy International*, 2022. <https://doi.org/10.1155/2022/9963030>
4. Fotteler, M., Risch, B., Gaugisch, P., Furmanek, J.-L., Swoboda, W., Mayer, S., Kohn, B., Dallmeier, D., & Denking, M. (2021). Obstacles to Using Assistive devices for Older Adults - Results from a Focus Group Analysis. *Studies in Health Technology and Informatics*, 281, 994–998. <https://doi.org/10.3233/SHTI210327>
5. Josephine Dasel, N., & Janet Punyit, P. (2014). Rehabilitation Process and Persons with Physical Dysfunctions. *IOSR Journal of Sports and Physical Education*, 1(3), 19–23. <https://doi.org/10.9790/6737-0131923>

6. Moen, R. D., & Østensjø, S. (2023). Understanding the use and benefits of assistive devices among young children with cerebral palsy and their families in Norway: a cross-sectional population-based registry study. *Disability and Rehabilitation: Assistive devices*, 1–9. <https://doi.org/10.1080/17483107.2023.2198563>
7. NHWDS. (2018). *Occupational Therapy 2016 Factsheet*. [file:///Users/esteh/Documents/Occupational Therapy - 2016.pdf](file:///Users/esteh/Documents/Occupational%20Therapy%20-%202016.pdf)
8. Patnaude, M. E. (2022). *EARLY'S PHYSICAL DYSFUNCTION PRACTICE SKILLS for the OCCUPATIONAL THERAPY ASSISTANT*. www.elsevier.com/permissions.
9. Pendleton, H. M., & Schultz-Krohn, W. (2018). *Pedretti's Occupational Therapy: Practice Skills for Physical Dysfunction*. <https://books.google.com/books?hl=es&lr=&id=BVFPAQAAQBAJ&pgis=1>
10. Radomski, M. V., & Latham, C. A. T. (2014). Occupational Therapy for Physical Dysfunction. In *The American Journal of Occupational Therapy* (Seventh Ed, Vol. 37, Issue 9). Lippincott Williams & Wilkins. <https://doi.org/10.5014/ajot.37.9.636>
11. van Dam, K., Gielissen, M., Bles, R., van der Poel, A., & Boon, B. (2023). The impact of assistive living technology on perceived independence of people with a physical disability in executing daily activities: a systematic literature review. *Disability and Rehabilitation: Assistive devices*, 0(0), 1–10. <https://doi.org/10.1080/17483107.2022.2162614>
12. WHO. (2022). Global Report on Assistive Devices. In *Global Report on Assistive Devices*. <https://www.who.int/teams/health-product-policy-and-standards/assistive-and-medical-technology/assistive-technology/global-report-on-assistive-technology>
13. Wissick, C. A., & Gardner, J. E. (2008). Conducting Assessments in Technology Needs: From Assessment to Implementation. *Assessment for Effective Intervention*, 33(2), 78–93. <https://doi.org/10.1177/1534508407311427>

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