

# Implementation of Community-Based Occupational Therapy for Stroke Patients in Functional Activities Using Assistive Device: Case Study <sup>†</sup>

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**Abstract:** Stroke is the major cause of disability globally. This disease can affect the patient's independence and functional mobility severely. Community-based occupational therapy is expected to improve the post-stroke patient's movement and independence to perform daily activities. This study aims to evaluate the effectiveness of community-based occupational therapy, providing assistive technology to a post-stroke patient with left-side paralysis in Sitisari village. The data were collected through the direct implementation of occupational therapy and semi-structured interviews with clients and families. Based on the evaluation, the results show a significant increase in the independence level and occupational performance after using assistive technology.

**Keywords:** occupational therapy; community-based occupational therapy; stroke; independency



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## 1. Introduction

A stroke is a significant cause of disability worldwide [1]. It may affect physical, cognitive, social, and emotional functioning. It has been estimated that 33–43% of stroke survivors require assistance for daily living activities even 3–6 months after a stroke attack. Moreover, 36% of them become disabled over five years after an episode of stroke [2,3]. A stroke is an acute focal neurological deficit caused by a vascular lesion, the onset is sudden, and the symptoms last longer than 24 h if the patient survives [4]. The most common symptoms of a stroke are weakness on one side of the body (61.4%), sudden difficulty speaking (25.7%), difficulty walking, loss of balance, or sudden dizziness (21.4%) [5].

Strokes can be divided into two major groups: ischemic and hemorrhagic. An ischemic stroke is caused by a lack of blood due to the blockage of arteries providing a blood supply to the brain or cerebrum. In contrast, a hemorrhagic stroke occurs because of intracranial bleeding due to the rupture of cerebral blood vessels [6]. The prevalence of non-communicable diseases, such as cancer, chronic kidney disease, diabetes mellitus, hypertension, and stroke, based on the results of Riskesdas in 2018, has increased compared to that of 2013. For example, the prevalence of strokes in Indonesia in 2018, given the doctor's diagnosis in a population > 15 years of age, was 10.9% or an estimated 2,120,362 people [7].

When a person has a stroke, they need emergency care, medication to prevent a stroke from returning, rehabilitation to help them learn skills lost due to a stroke, or all three [8]. In addition, stroke patients may experience limitations in carrying out activities, such as completing eating activities, bathing/personal hygiene, and dressing, because patients have limited ability to perform physical movements independently [9]. An occupational therapist is one of the health workers who can conduct post-stroke interventions. They work to improve the health and well-being of their clients by focusing on physical and mental health impaired by illness, injury, accident, or growth and development disorders [10].

The main goal of occupational therapy is to enable individuals to participate in their daily activities (ADL). These goals can be achieved through collaboration with individuals and communities to increase their involvement in the activities they want, need, or expect, or by modifying activities and the environment to support engagement in activities [11]. There are various fields that occupational therapists can execute as practitioners, one of which is the practice of community-based occupational therapy. Occupational therapists' roles include program planning, examination, evaluation, and training of village officials or cadres, community health consultants, policymakers, and primary care providers. In addition, occupational therapy practitioners in the community can function as public health advocates, consultants, case managers, employers, supervisors, and program managers [12].

## 2. Research Methods

This research has been conducted using qualitative methods with deductive and inductive descriptions. This descriptive study aims to systematically draw a case study of the management of occupational therapists using an assistive device approach in one of the stroke patients in Situsari Village, Bogor Regency. The primary data was collected through interviews, observations, and direct management of the subject.

The study subject was Mr. H, a stroke patient since 2016, who suffered from a weakness on the left side of his body. An examination of occupational therapy on Mr. H found a decrease in the range of motion of the joints in the patient's left upper and lower extremities. In addition, there was also a decrease in muscle tone, strength, and endurance. Mr. H also occasionally felt numbness and tingling in the tips of his fingers at certain times. This condition resulted in Mr. H's inability to perform daily activities, and exceptionally functional mobility, due to limitations in proprioception, kinesthetic, stereognosis, joint range of motion, muscle strength, muscle tone, and endurance. The role of the occupational therapist, in this case with an assistive approach, is divided into several programs in sequence as follows:

1. Able to perform activities from sitting to getting up independently. In this program, the client strengthens muscles by stretching the hip, knee, and ankle areas (Figure 1), and moving plates from the floor to the rack. This program aims to help patients achieve the highest level of function by increasing muscle strength in the hip, knee, and ankle, and making it easier for them to perform activities from sitting to getting up.



**Figure 1.** Strengthens client's muscles by stretching the hip, knee, and ankle areas.

2. Able to make transfers using the parallel bar tool. In this program, the client performs passive and active stretching in the hip, knee, and ankle areas (Figure 2), then performs Otago exercises and is stimulated by using a parallel bar. The purpose of performing

this activity is so that the patient can move from the chair to other activities in the house using the parallel bar.



**Figure 2.** The client performs passive and active stretching in the hip, knee, and ankle areas.

3. Able to walk as far with mobility aids. In this program, the client is asked to perform walking activities (Figure 3) with the aim of promoting independence when carrying out daily activities, using parallel bars.



**Figure 3.** Client walks using parallel bars.

In the fulfillment of the mobility independence program using assistive devices, occupational therapists provide home programs in the form of:

- a. Move objects from sitting to standing ten times a day.
- b. Morning walk on the concrete street in front of the house for 10–15 min daily.
- c. Exercise from a squatting position to a standing position for 10–15 min daily.

Initially, Mr. H tended to hold on to sofa when waking up due to muscle weakness in the hip, knee, and ankle. Furthermore, Mr. H had difficulty maintaining balance when standing due to the pain in the hips, which causes Mr. H's tilted posture. However, after the intervention, there was increased muscle strength in the hip and ankle, which enabled Mr. H to get up independently without holding on to the sofa, by simply holding his body on the floor. In addition, Mr. H had become more stable in maintaining balance when standing, by positioning his feet and posture so that they were no longer tilted.

After Mr. H could maintain his balance when standing up, Mr. H was made a tool in the form of a parallel bar. Currently, Mr. H has been able to independently carry out movement activities in the neighborhood with no difficulty lifting his hips, especially when crossing the streets around his house.

### 3. Discussion

A stroke can affect one's independence, especially in mobilization activities. For example, stroke patients can experience limitations in activities, such as completing eating activities, bathing/hygiene, and dressing/dressing up, because patients cannot perform physical movements independently [9]. In this case study, immediately following the stroke attack, Mr. H had limitations in the upper and lower extremities on the left side of his body that caused difficulty performing functional mobilization. Therefore, giving assistive devices as a therapy program is considered the right choice for restoring the client's ability. The Management of Occupational Therapy, through the approach of providing assistive devices to Mr. H, is based on several programs, among others:

1. Stretching and exercise exercises strengthen muscles and increase ROM, especially in the hip, knee, and ankle.
2. Providing a balanced exercise program for transfer activities in the home.
3. Mobilizing independence programs in the environment around the house using assistive mobility devices.

A relationship exists between the provision of aids and the client's motor function. This result is in line with the study conducted by Caro et al. (2018), which stated that there was a positive relationship between mobility aids and independence in the motor area of post-stroke clients ( $p < 0.05$ ) [13,14].

In addition, the provision of assistive devices to Mr. H shows a correlation between the use of assistive technology and increasing the client's independence after the stroke. The results of this study are consistent with the research of Salminen et al. (2009), which proves that the provision of mobility aids can increase the independence and participation of clients in daily life [15]. Furthermore, providing assistive devices has been shown to reduce the assistance of others by 50% [16].

### 4. Conclusions

In the case study, performing an occupational therapy intervention program, using an assistive device on Mr. H under direct supervision by the therapist, improved the client's independence in mobilization and performing daily activities.

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