

PAPER

# A Mobility Support Device for Patients with Walking Disabilities

Rachanee, Golf Tien,  
Kantaya Boonmee,  
Pattarawadee Potipat,  
Poravee Prasongrat\*

Tourism Management, Trat  
Polytechnic College, Trat,  
Thailand.

Correspondence Author Email:  
poravee1608p@gmail.com

## ABSTRACT

The project entitled "A Mobility Support Device for Patients with Walking Disabilities" aimed to (1) study the methods for designing and developing a walking support device for patients, and (2) examine the satisfaction of users who tested the device. The study population consisted of two experts in aluminum device. User satisfaction with walking aids for patients (those unable to walk normally) showed that the design aspect had an average score of 4.07, the device aspect had an average score of 3.74, and the safety aspect had an average score of 3.72.

## KEYWORDS

Support Equipment; Movement; Walking Disorder; Satisfaction; Physiotherapist

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## 1. INTRODUCTION

Health care that focuses on access and modern care models have been modified to match the situation of the patient's mobility. Loss of ability to walk, balance and weight transfer control while moving the legs Due to muscle weakness that are not able to move normally Causing the brain to learn that does not match normal walking The patient will have difficulty in movement. Because there may be pain in the body Therefore, patient care with phototherapy is an important step and is what the patient wants. In restoring their own body to return to a body condition close to normal Which requires a period of physical rehabilitation.

For that reason, the project organizer has the idea of bringing technology. Support equipment for patients (for patients who cannot walk normally) that is a helper for patients who want to practice walking or after surgery who need physical therapy. With the design of a movement control system and a change in the use of traditional equipment to look more modern, easy to use and safe for users. Can also count the steps of the user This project will focus on.

## 2. METHOD

The research instrument was a questionnaire comprising multiple-choice questions. Data were analyzed using descriptive statistics, including percentage, mean, and standard deviation.

**Table 1.** the number of data providers in quantitative research.

| Information Provider                 | Number (Pax) |
|--------------------------------------|--------------|
| 1. Aluminum equipment design expert. | 2            |
| 2. Physical or medical specialist    | 2            |
| 3. Elderly or patients               | 26           |
| Total                                | 30           |



**Figure 1.** Walking support devices for patients who cannot walk normally.

Formula for calculating the mean ( $\bar{x}$ )

$$\bar{x} = \frac{\sum x}{n}$$

$\bar{x}$  = mean

$\sum x$  = sum of all data points

$n$  = number of data points.

3.7.2. Analyzing data in sample distribution, using inferential statistics, analyzing the amount of variation for the data. A geirly watent on distribution or the data points (point a data distribution).

Formula for calculating standard deviation (S.D.)

$$S.D. = \sqrt{\frac{\sum (x_i - \bar{x})^2}{N - 1}}$$

where S.D. = standard deviation

$\sum$  = sum of data points

$N$  = number of data points

$\bar{x}$  = mean

$x_i$  = individual data point.

3.7.3. Analyzing data in sample distribution, using distribution by important percentages, sample distribution of mathematical representation by part per hundred, changes in percentages. Formula for calculating percentages is an over average (standard deviation).

Formula for calculating percentages

$$P = \left( \frac{F}{n} \right) * 100$$

where P = percentage

F = number of items intended to be percentage

n = total number of items (total data points)

**Figure 2.** Formula for calculating the mean ( $\bar{x}$ )

### 3. RESULT AND DISCUSSION

**Table 2.** Summarize the analysis of various data aspects.

| Evaluation list                            | Average<br>( $\bar{x}$ ) | Standard<br>deviation (SD) | Evaluation<br>criteria |
|--------------------------------------------|--------------------------|----------------------------|------------------------|
| 1. Equipment structure design.             | 4.07                     | 0.22                       | A lot                  |
| 2. Safety aspects of the equipment.        | 3.73                     | 0.01                       | A lot                  |
| 3. Equipment usage.                        | 3.94                     | 0.18                       | A lot                  |
| Summary of performance evaluation results. | 3.91                     | 0.16                       | A lot                  |

Table 2. shows the results of the data analysis regarding satisfaction levels with walking aids for patients with mobility impairments, ranked from highest to lowest. Overall satisfaction was high, with a mean score of 3.91. Considering each item individually, the highest satisfaction was in the device's structural design, with a mean score of 4.07 (high level). This was followed by device usability (meaning 3.94, high level), and device safety (meaning 3.72, high level).

Additional Suggestions for Improving Walking Assistive Devices for Patients with Normal Walking Ability. The project studying the design of walking assistive devices for patients with normal walking ability should include the following developments, improvements, and suggestions. Add a supportive device. This tool or equipment is more suitable for children, such as those with cerebral palsy (CP), than for surgical patients. If you want to make it suitable for surgical patients, it is recommended to remove two wheels, as there is a relatively high risk of falls.

### 4. CONCLUSION

Based on the research findings above, the researchers have the following points that should be discussed to support the research. The study and development of a walking aid device for patients (those unable to walk normally) showed that it is practical to use, with an overall high level of satisfaction (average 3.91). The device's structure is strong (average 4.20), the materials are suitable (average 4.17), it is easy to use (average 3.83), it can support weight (average 4.17), it is safe for users (average 3.60), and the design is attractive (average 4.13). Experts suggested improvements to the walking aid device, including adding features for patients with cerebral palsy (CP), and that this device is more suitable for children with CP (cerebral palsy - individuals with movement and posture abnormalities resulting from damage to the developing brain; patients may have developmental and balance problems) than for surgical patients. If suitable for surgical patients, two wheels should be removed due to the high risk of falls. This aligns with the research of Mr. Warat Sitlaothaworn

(2016) on the design of a walking aid device for patients. (Patients who cannot walk normally) It was found that patients who need to practice walking, using a walking aid, prevent falls, and need weight.

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