

## Improvement of Cadres' and Health Care Workers' Knowledge of Diabetic Foot Care and Rehabilitation with Community-Based Rehabilitation Webinar Program in Indonesia

Melinda Harini, Widjajalaksmi Kusumaningsih, Ira Mistivani, Herdiman Bernard Purba, Deddy Tedjasukmana, Peggy Sunarjo, Ibrahim Agung, Fitri Anestherita, Lucya Putri Juwita, Edwin Goutama, Ega Jaya, Lili Dwiyani, Lina Maylani, Nasya Marisyka Putri, Rimnauli Deasy Putryanti Sinaga, Sagung Adi Sresti Mahayana, Tiffany Sofian, Zenik Kusrini, Annisa Maharani, Yunisa Trivarsary and Gilang Rama Putra  
Department of Rehabilitation Medicine, Faculty of Medicine,  
University of Indonesia-Cipto Mangunkusumo Hospital, Jakarta, Indonesia

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### ABSTRACT

**Objectives:** To analyse the effect of a community-based rehabilitation (CBR) webinar program on cadres' and health care workers' knowledge of diabetic foot care and rehabilitation.

**Study design:** A quasi-experimental study.

**Setting:** Public Health Center of Kepulauan Seribu, Jakarta, Indonesia.

**Subjects:** Thirty-five Cadres and health care workers who voluntarily registered and attended a 6-session webinar program on diabetic foot care and rehabilitation.

**Methods:** The webinar program consisted of 3 topics: 2 sessions on early detection, 1 session on prevention, and 3 sessions on basic rehabilitative management of diabetic foot care. The participants had to complete a pre-test before each webinar session to assess their basic knowledge of each topic and a post-test to re-assess newly learned knowledge. The scores of the pre- and post-tests were then analyzed using the Wilcoxon-Signed rank test to measure the improvement of the participants' knowledge.

**Results:** The pre-test scores showed that basic knowledge was highest in the early detection topic and least in the basic rehabilitative management. The post-test scores were increased significantly in most of the webinar sessions ( $p$ -value  $< 0.05$ ), except in the 4<sup>th</sup> session ( $p$ -value  $> 0.05$ ).

**Conclusion:** The 6-session CBR webinar program on diabetic foot care improved cadres' and health care workers' knowledge of diabetic foot care and rehabilitation. A subsequent study to evaluate the implementation of the webinar CBR program for patients with diabetic foot in Kepulauan Seribu is needed.

**Keywords:** community-based rehabilitation, diabetic foot, rehabilitation, webinar

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### Introduction

In Indonesia, people over 15 years old suffering from diabetes mellitus was 6.9% among its population of more than 500 million<sup>1</sup> and continued to increase by 2% in 2018 based on the result of the Basic Health Research by the Ministry of Health Data and Information Center.<sup>1,2</sup> Diabetes mellitus is a chronic disease with many complications that impair a patient's quality of life. A diabetic foot ulcer is a common and severe complication of diabetes mellitus with high morbidity and mortality rates.<sup>3</sup> In the first 12 months, diabetic foot ulcers were associated with a 5% mortality rate and increased to 42% in 5 years.<sup>3</sup> A multidisciplinary approach is key to diabetic foot ulcer management. Furthermore, Community-based Rehabilitation (CBR) is a strategy that aims to assist, support, and apply for rehabilitation programs in the community; and to help people with disabilities to improve their quality of life.<sup>4</sup> A good knowledge among cadres and health care workers is an essential marker for the success of the CBR program.

Rehabilitation programs including exercises, proper footwear and shoe modification, and ambulatory aids, can be used to improve the diabetic foot ulcers condition,<sup>5</sup> and can reduce the burden of diabetic foot problems.<sup>6-8</sup> Therefore, the Department of Physical Medicine and Medical Rehabilitation, University of Indonesia, concerned about the serious impact of diabetic foot problems on individuals' functioning and decided to conduct a CBR teaching program on basic diabetic foot care and rehabilitation to improve knowledge of cadres and health workers in Indonesia. The first two sessions of early detection included identification and impact of diabetic foot problems on patient's daily living, assessment

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**Correspondence to:** Harini Melinda, Psychiatrist, Department of Physical Medicine and Medical Rehabilitation, Faculty of Medicine, University of Indonesia Cipto Mangunkusumo National Center General Hospital, Jakarta. E-mail address: rbfmkui@gmail.com

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of the sexual dysfunction related to diabetic foot; the third session was prevention of diabetic foot ulcers; and the last three sessions of basic rehabilitative management consisted of physical exercises for patients with diabetic foot problems, diabetic foot gymnastics and use of a walker.

Previously, CBR educational programs were conducted in a conventional face-to-face classroom. Due to the COVID-19 situation, a webinar was chosen as a new online distance teaching-learning method.<sup>9,10</sup> Participants and facilitators living in distant areas can communicate directly by virtual platforms and interact in real-time via voice over IP (Internet Protocol) technology and web camera equipment.<sup>11</sup> As this was the first-time webinar CBR program on the diabetic foot for cadres and health care workers we conducted, the objective of this study was to determine the effectiveness of this program.

## Methods

Cadres and health care workers at the Public Health Center of Kepulauan Seribu were invited to voluntarily register for the webinar CBR program on diabetic foot care and rehabilitation via a google form. The program of 6 sessions delivered by physical medicine and rehabilitation specialists was announced. The first session was conducted on 2<sup>nd</sup> July 2021 and the last session on 17<sup>th</sup> September 2021.

At the beginning of each session, a moderator provided a google form link to a pre-test. All attending participants were asked to complete the pre-test before a speaker started the session, and at the end, they could directly ask the speaker or send a question through a chat column, followed by a google form link for the post-test that they had to be

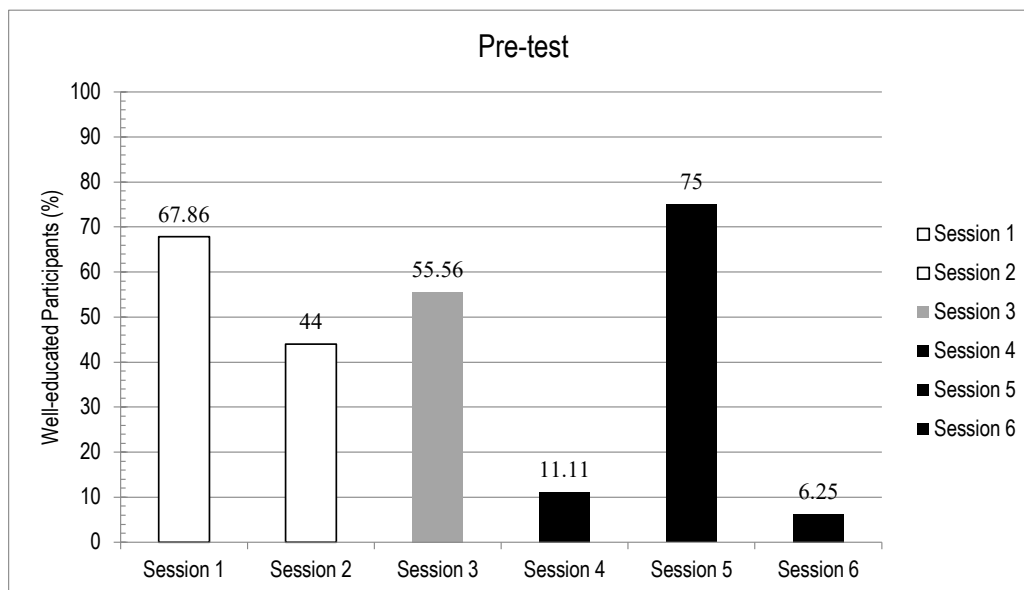
completed within 24 hours. The pre-test and post-test scores ranged from 0 to 100, and were measured after each session. Questions in the pre-test and the post-test of each session were the same.

The pre-test and post-test scores in each session of attending participants were measured. The outcome of this study was the participants' improvement in basic knowledge of diabetic foot care and rehabilitation after attending the program. Any participants were considered well-educated if their pre-test score reached 80 or more. The open-ended or multiple choice or true/false questions? in the pre- and post-test of each session were the same? and related to the topic of the session. The participants were said to have better knowledge if the post-test scores improved significantly than the pre-test scores ( $p < 0.05$ , using the Wilcoxon-Signed rank test).

## Results

There were 35 participants registered. Their average age was 37 (SD 7.8) years old, ranging from 23 to 55 years old; two-thirds of the participants were female; 37.1% of the participants were nurses, 34.3% were medical doctors, and others included housewives (17.1%), civil servants (5.7%), a dentist (2.9%) and a medical administrator (2.9%). The attendance number of participants varied, highest ( $n = 20$ ) in the first two sessions and lowest ( $n = 13$ ) in the 4<sup>th</sup> session, as shown in Table 1.

Not all of the attending participants answered both the pre-test and post-test in each session. The percentage of completing the pre-test and post- tests based on the total attendance of each session was highest (83.3%) in the 5<sup>th</sup> session and the lowest (64.5%) in the 1<sup>st</sup> session. Based on



<sup>1</sup>Mean proportion

**Figure 1.** The percentage of well-educated participants in each session. Sessions 1 and 2 on early detection, session 3 on prevention and sessions 4, 5 and 6 on basic rehabilitative management

occupations, the percentage of the pre-test and post-test completion was highest among the nurses (64.1%), followed by medical doctors (56.9%), housewives (43.1%), dentists (41.7%), medical administrators (25%) and civil servant (20.8%).

The mean pre-test scores were 75.3 (SD 21.2) in the two early detection sessions, 73.3 (SD 16.5) in the diabetic foot prevention session, and 63.3 (SD 9.0) in the three basic rehabilitative management sessions. Figure 1 shows the percentage of well-educated participants based on the pre-test score of 80 points or more in each session, the highest (75%) in the 5th session of prevention of diabetic foot ulcers and the lowest (6.3%) in the last session of use of walkers.

Table 1 shows the pre- and post-test scores in each session of the participants who answered both tests. The median post-test score increased significantly in the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, and 6<sup>th</sup> sessions (Wilcoxon-Signed rank test,  $p$ -value < 0.05). The most improvement was in the 6th post-test score. The pre- and post-test were not significantly different in the 4<sup>th</sup> session scores ( $p$ -value > 0.05).

The participant's feedbacks were that the webinar should be held in the morning instead of in the afternoon and the availability of a good internet connection to increase their participation in each webinar session.

## Discussion

This quasi-experimental study demonstrated the effect of the webinar CBR program, which aimed to improve cadres' and health care workers' knowledge of patients with diabetic feet. Based on the statistical analysis of the pre-test and post-test scores, the knowledge improvement among the participants in most of the sessions reflects that the participants could understand more about early detection of diabetic foot problems and impacts on patient's daily activities, prevention of diabetic foot ulcers, proper rehabilitation programs such as exercises in general and specifically for patients with diabetic foot, and use of ambulation aids. The highest improvement score on the use of ambulatory aids may be due to a lack of initial knowledge in the use and selection of a walker for

patients with diabetes, and the new information provided was easy to understand. The improvement of knowledge in cadres who are the first line educators in the CBR program and in the health care workers who are the medical professionals is hoped to have a massive impact on patients' quality of life.

Moreover, the results showed that before attending the program, they had some basic knowledge based on the pre-test score, the highest in early detection topic, followed by prevention, and the least in basic rehabilitative management. They might have had some knowledge of early detection and prevention of diabetic foot problems as these topics are common in the daily practice of cadres and health care workers or delivered in other seminars. The results also demonstrate that they had little knowledge of the basic rehabilitative management in patients with diabetic foot. Adding the basic rehabilitative management in the CBR webinar program increases the knowledge of the cadres and health care workers and hopefully that they will implement exercises, proper footwear, and the use of ambulatory aids to prevent complications of diabetic foot problems.<sup>12</sup> WHO stated that CBR is community action to ensure that people with disabilities have the same rights and opportunities as the other community members, including equal access to health care, education, skills training, employment, family life, social mobility, and political empowerment.<sup>13</sup>

The post- tests within 24 hours after the session ended gave the real-time measurement of participants' knowledge regarding the information about diabetic foot patients. The weak points of this webinar CBR program were the inconsistent attendance of participants in each session, as seen in Table 1. This variation was due to the webinar being held during the working days. Some participants had to work during the webinar. Some had limitations of internet connection. A more suitable time for the webinar such as in the morning or during the weekend and a good internet connection will ensure better participants' attendance. The pre- and post-tests used in this program should be validated and tested to make the questions more suitable for participants with different educational levels, easy to understand, unambiguous, and unbiased.<sup>14</sup>

**Table 1.** Comparison between the pre- and post-test scores of the participants who answered both tests in each session

| Topic                               | Sessions | Test | N  | Median | Min  | Max | $p$ -value |
|-------------------------------------|----------|------|----|--------|------|-----|------------|
| Early detection                     | 1        | Pre  | 20 | 80     | 10   | 100 | 0.010      |
|                                     |          | Post | 20 | 100    | 60   | 100 |            |
|                                     | 2        | Pre  | 20 | 70     | 50   | 100 | < 0.001    |
|                                     |          | Post | 20 | 100    | 70   | 100 |            |
| Prevention                          | 3        | Pre  | 14 | 80     | 50   | 100 | 0.019      |
|                                     |          | Post | 14 | 95     | 60   | 100 |            |
| The basic rehabilitation management | 4        | Pre  | 13 | 60     | 30   | 80  | 0.435      |
|                                     |          | Post | 13 | 70     | 10   | 100 |            |
|                                     | 5        | Pre  | 15 | 80     | 60   | 100 | 0.013      |
|                                     |          | Post | 15 | 100    | 80   | 100 |            |
|                                     | 6        | Pre  | 14 | 56.3   | 37.5 | 100 | 0.005      |
|                                     |          | Post | 14 | 93.8   | 37.5 | 100 |            |

## Conclusions

The webinar CBR program on diabetic foot increases cadres' and health care workers' knowledge of diabetic foot, especially in basic rehabilitative management. Its main limitation is participants' inconsistency in participating which has to be considered. For improvement, the pre- and post-test questions need to be evaluated for further use and the subsequent study is to evaluate the implementation of the CBR Program for patients with diabetic foot in Kepulauan Seribu

## Disclosure

The authors have nothing to disclose.

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