

Research Paper

The Effect of Mobile-Based Self-Care Program on Balance of People with Multiple Sclerosis

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Abstract

Introduction: Nowadays the use of mobile health technology to improve health is a great opportunity for developing countries, to have a more efficient health system by telemedicine education. So the purpose of this study was to investigate the effect of mobile-based self-care application on the balance of people with multiple sclerosis.

Methods: The present study is a clinical trial study performed in Chaharmahal and Bakhtiari province in 2019. The study units were selected by convenience sampling and were divided into two groups of experimental and control. At first, balance level of the patients was measured by Tinetti (Tinetti Performance Oriented Mobility Assessment) questionnaire. Then, for the experimental group, the self-care application was installed on their cell phone and for two months was used by patients. The control group received no intervention during this period. The application usage rate was measured by self-report checklists. After two months balance level was again measured in both groups. Data were analyzed by using SPSS-21 software and chi-square and independent and paired t-test.

Results: Participants in two groups had no significant difference in terms of demographic characteristics and underlying variables including: Age ($P = 0.736$), age groups ($P = 0.955$), gender ($P = 0.722$), education ($P = 0.880$), marital status ($P = 0.358$), and occupation ($P = 0.172$). Before intervention, the mean of balance score was 10.61 ± 3.78 in the control group and 10.55 ± 2.96 in the experimental group, that was not statistically significant ($P = 0.945$). It was while, two months after intervention the mean balance score in the control group was 10.52 ± 3.63 and in the experimental group was 12.00 ± 2.47 and the difference was statistically significant ($P = 0.049$).

Conclusions: The results show that implementation mobile-based self-care applications is effective in improving the balance of the patients with multiple sclerosis. Therefore, mobile applications of this supportive method could be useful to manage their disease and to obtain self-care skills

Extended Abstract

OBJECTIVE

Multiple Sclerosis is an autoimmune, inflammatory, and chronic disease (4). Balance disorder is one of the earliest and most common symptoms in patients with multiple sclerosis (11). Despite advances in medical science in recent years, no definitive cure has been found for the disease, and more existing treatments can reduce symptoms or slow the progression of the disease (13).

Self-care is an important part in the treatment of multiple sclerosis (17). Wlodyka et al. (2011) stated that self-care programs are an integral part of MS management and should be consistent with the symptoms of patients with multiple sclerosis and include all aspects of their care (19).

Today, the greatest emphasis of new care models in disease management is on the effectiveness of care and quality of life and their combination with technology (20). In this regard, mobile technology in combination with medical specialties, has introduced a new possibility called mobile health, which due to the pervasive nature of mobile technology provides new opportunities to improve patients' health (22, 23).

According to a study by Winberg et al. (2017), few studies have been conducted on the use of mobile applications in neurological disorders, including multiple sclerosis (28). On the other hand, in Iran, mobile-based applications with the content of symptom management, exercise, nutrition and daily needs have not been designed for patients with multiple sclerosis. Therefore, the present study was conducted with the aim of the effect of self-care program based on mobile application on the balance of people with multiple sclerosis.

MATERIALS AND METHODS

This clinical trial study was performed on 72 patients with MS, members of the MS Association of

Chaharmahal and Bakhtiari Province. Samples were selected based on easy sampling and randomly assigned to experimental (n = 36) and control (n = 36) groups. Data were collected using a Tinetti Performance Oriented Mobility Assessment with demographic characteristics. Before the intervention, the balance of both groups was measured using a balance section of the Tinetti Performance Oriented Mobility Assessment by an evaluator who was blind to the type of intervention.

For the experimental group, a researcher-made self-care program was installed as a mobile application on their smartphone. To prevent information leakage, the software was designed to be installed only on a mobile phone and could not be transferred. In order to ensure that samples of research use of the software during the intervention, a self-report checklist was provided to patients and they were asked to complete this checklist on a daily basis. Finally, two months after the intervention, the patients' balance was measured again by another evaluator, who was also blind to the type of intervention and independent of the first evaluator, at the same time in both groups.

In this study to analyze the data, version 21 of SPSS software and Chi-square, independent t-test and paired t-test was used at a significance level of 0.05.

RESULT

The results showed that the mean balance scores in the experimental and control groups before the intervention were not statistically significant difference ($P = 0.945$). While this difference was significant after the intervention ($P = 0.049$). Also the difference between the mean balance score before and after the intervention in the control group was not significant ($P = 0.784$) but this difference was significant in the experimental group ($P < 0.001$).

Table 1. Comparison Within and Between Groups of Mean Balance Score before and After Intervention in Experimental and Control Groups

| Variable | Control | Test | Differences Between Groups | Within Group P |
|------------------------|--------------|--------------|----------------------------|--------------------|
| Balance | | | | |
| Before intervention | 10.61 ± 3.78 | 10.55 ± 2.96 | 0.55 | 0.945 |
| After the intervention | 10.52 ± 3.63 | 12.00 ± 2.47 | 1.47 | 0.049 |
| within the group P | 0.784 | 0.000 | | within the group P |

Data in table are presented as Mean ± SD.

CONCLUSION

The results of the present study showed that self-care program based on mobile application leads to improving the balance of people with multiple sclerosis. However, Giunti et al. (2018) in their study stated that current applications related to multiple sclerosis are not able to meet the needs and wants of patients with this disease (27). But it can be said that if the design and content of the self-care program is appropriate to the abilities and needs of patients with MS disease can improve the

symptoms and performance of these patients in life. On the other hand, due to the high power of new technologies such as mobile phones in providing services and changes in health behaviors related to people's health, so a combination of self-care programs and mobile phones is recommended.

Ethical Consideration

In this study, the observance of ethical points was confirmed by Shahrekord University of Medical

Sciences with the code IR.SKUMS.Rec.290 Also, after providing clear explanations about the objectives of the study and the method of its implementation, and the confidentiality of information, all participants signed a written informed consent form.

Funding or Support

This study was conducted with the financial support of Shahrekord University of Medical Sciences.

Authors Contribution

In this study, Mr Safian was in charge of the main idea of the research, initial writing, data collection and implementation of the intervention. Mr Davodvand has done the basic idea of studying, designing the intervention, writing, following up and editing the article and supervising the project and Mr. Masoudi has done supervision and scientific research advice. Also, Mr. Sedehi was in charge of statistical analysis of data, Mr. Tahmasebian was in charge of application design and Ms. Jivad was in charge of project supervision.

Conflicts of Interest

There is no conflict of interest in this article.

Applicable Remark

Implementing self-care programs can be used as a beneficial, low-cost and safe method of balancing patients with multiple sclerosis. On the other hand, today, mobile technology is a new way of providing health services, which has created a unique opportunity to improve the health and quality of life of patients due to the rapid growth of mobile phone users and the possibility of using applications in mobile phones. Therefore, managers and planners in the field of health can help with more attention and appropriate budget allocation.

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