

# The effect of electronic package on satisfaction in multiple sclerosis patients

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## Abstract

**Background:** Traditional teaching methods used in medical education cannot wholly respond to the rapid changes and growth of information as well as continuous changes in the educational needs of society, especially patients with chronic diseases such as multiple sclerosis (MS). Therefore, this study was designed with the aim of examining the effect of electronic package on satisfaction in MS patients.

**Materials and Methods:** The research was a quasi-experimental study. It was carried out at the MS Kashani Center affiliated to the Isfahan University of Medical Sciences, in 2013. One hundred twenty-eight patients with MS were allocated randomly into two equal groups of 64 each for education by booklet (control) and education by multimedia software (experimental) for 2 weeks. Data were collected by processing questionnaires, which consisted of questions about satisfaction (17 items) and questions about demographic and disease characteristics (9 items), answered by both groups before and 2 weeks after education. SPSS version 14 (DARYA software, Iran) was used to conduct statistical tests such as the independent *t*-test and the paired *t*-test for analyzing the data. The statistical significance level was less than 0.05.

**Results:** The results show that there was not any significant difference between the satisfaction scores of the electronic package and control groups before intervention, but that there was a significant difference after 2 weeks' intervention ( $P = 0.010$ ).

**Conclusion:** The electronic programs comprised an attractive education method. So this technology can increase motivation in MS patients to study more about the disease process.

**Key Words:** Education, electronic, Iran, multiple sclerosis, patient satisfaction, satisfaction

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## INTRODUCTION

Multiple sclerosis (MS) is a chronic, inflammatory, and demyelinating disease of the central nervous system (CNS) with unpredictable prognosis amongst individuals. According to the Iran MS society, about 40,000 individuals are affected and in Isfahan the prevalence of the disease is reported to be 35, 5 amongst 100,000 individual, which puts the province of Isfahan among regions with moderate to high MS risk.<sup>[1,2]</sup>

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Due to the high prevalence of MS, high disability rates, high expenses, and other problems, it seems necessary to consider the education of patients about their disease and plans to reduce the problems and symptoms of patients. Furthermore, it was demonstrated that the accessibility of health services plays an important role in improving the health of patients.<sup>[3,4]</sup>

Preventive medicine and the promotion of the knowledge and satisfaction of people are the best ways to ensure the health of a society, and educating the patients is the core commitment of every health care center. Using multimedia computer programs is suggested as an effective substitute for improving the knowledge and satisfaction of patients.<sup>[5]</sup>

In the new form of education, it is not necessary to educate the individuals in educational centers with closed walls, but it can be extensively conducted in public-access space with adequate flexibility of time and place.<sup>[6]</sup> E-learning refers to personal education, in which the learners can achieve educational goals based on their individual talents, and, in fact, learn how to learn, which is one of the goals of education, and it is lifelong learning. This type of education is the most important application of information technology and is provided in the form of open-line learning with various modes, such as computer-based learning, web-based learning, and closed-line learning.<sup>[7]</sup>

Various methods are being used in health care systems for educating the patients. The majority of them consist of speeches and pamphlets; however, the results of these methods are not consistent amongst studies. Considering the importance of education in caring for MS patients, here we aim to compare the effects of electronic-based teaching techniques and pamphlets on satisfaction of patients.

## MATERIALS AND METHODS

The researcher was referred to the MS Kashani Center in Isfahan after obtaining approval for the study from the Ethics Committee of Isfahan University of Medical Sciences. For a homogenous conventional MS education, the researcher tried to conduct education with matched subjects in both groups. Therefore, just one MS center was selected (MS Kashani center). The sampling method used was convenient sampling with random allocation of the subjects to both groups. Therefore, among patients referred to the MS Kashani center each day, the first patients was randomly selected to undergo electronic education and the second patients selected to be educated by an illustrated booklet. At first, the researcher selected the qualified subjects based on the subjects'

selection checklist and inclusion criteria, gave them an informed consent form to sign, and explained the goal of research to them. Then, before any education was begun, questionnaires consisting of questions on satisfaction about educational content, environment, attractive and the availability of the education demographic information, and disease characteristics were filled out by the subjects in both groups.

Sample size was calculated as 54 subjects in each group (a total of 110 subjects) by the use of mean comparison formula. With 20% as the rate of possible subjects dropping out during the study and to have the utmost assurance for an adequate number of subjects, the total number of subjects was calculated to be 128.

The inclusion criteria were age 15-50 years, having a phone number to contact; having Iranian nationality and residing in Isfahan; having at least the literacy to read and write Persian; having a computer or a VCR at home and being able to use them; being able to speak, hear, and see; not being a member of the working staff of medical sciences-affiliated units; and not having attended classes related to MS.

The tools used in this study included: a questionnaire containing questions on demographic and disease characteristics in nine items (age, gender, level of education, marital status, occupation, income, type of treatment, duration of illness, and the source of MS education), and a satisfaction questionnaire in order to evaluate the effectiveness of the electronic package. The satisfaction questionnaire was designed based on Ersi standard questionnaire (2000) and a literature review of valid texts in the form of a researcher-made questionnaire containing 17 questions and a 5-point Likert scale ranging from absolutely satisfied (score 5) to absolutely dissatisfied (score 1).

Due to the lack of availability of a standard questionnaire in this field, such a questionnaire was designed through the use of a country-wide national project, references, and textbooks, and its validity was confirmed by five faculty members of the medical school. Its reliability was confirmed by use of a pilot study (conducted on 10 patients) and calculation of Cronbach's alpha ( $\alpha = 0.91$ ).

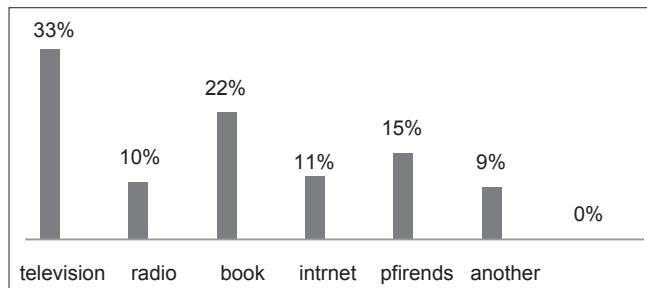
For the multimedia group, after visiting the MS patients, a CD was given to them. The CD contained material for MS education presented through text, pictures, animation, and sound, as well as a slideshow. This 30-minute software package contained MS education material on the following issues: a description of the disease, causes, signs, and symptoms, effects of the disease on health, prognosis, treatment, benefits

and side effects of treatment, and recommendation for how to alleviate the symptoms of the disease. Access to the internet was not possible for all patients in the form of an open line in the present study, and it was found that in similar studies the materials were taught through multimedia methods. On the other hand, the internet speed is so low that it leads to low quality of sound and image in online education in Iran. Therefore, educational content was in the form of a web page or Flash Video (FLV), Windows Media Video (WMV), and MPEG-4 (MP4), as these formats can be used in a off-line web. After an explanation was given to the patients as to how to use the CD, they were informed that they would be asked some related questions 2 weeks later.

For the second group, after being visited, the subjects were given an educational booklet that contained text with pictures (illustrations). The subjects were asked to study the material, and 2 weeks later, a satisfaction questionnaire was given to them, too, to fill out over the phone. The educational content in both multimedia and illustrated booklet education groups, designed by the researcher, was identical. If the patients had any questions about the education texts and the software, as well as other questions, those questions were answered over the phone. The data were analyzed using the independent *t*-test, the paired *t*-test, and the Chi-square test on SPSS version 14 (DARYA software, Iran). The level of statistical significance was taken to be 0.05.

**RESULTS**

The mean age of the patients and the mean duration of the disease were (20.3 ± 4.01) years and (2.5 ± 0.02) years respectively. Three-quarters of the patients were married (75%), most had a high school certificate or a lower level of schooling (71%), just over half were unemployed (55%), and just over half had adequate income (54%). Also, the majority of patients had received methylprednisolone (Medrol, Solu-Medrol) (65%) as their main treatment. Most sources of information for learning about the disease were as follows: television (33%) and books (12%) [Figure 1]. To get information some patients were



**Figure 1:** Frequency distribution of subjects based on the source of obtained information

offered family and friends and others were offered television (33%), radio (22%), and internet (16%).

Both groups were homogenous in subject age, marital status, income level, education level, and duration of disease (*P* > 0.05).

Table 1 shows that the mean scores of satisfaction for education about diseases increased significantly after intervention compared to the scores before intervention in both multimedia and control groups.

Two weeks after intervention, 65% were satisfied with education in the multimedia group, while 45% were satisfied with education in the booklet group. In addition, the level of satisfaction showed a 148% increase in the multimedia group and a 113% increase in the booklet group after intervention; moreover, there was a significant difference between the two groups (*P* = 0.002).

The highest and the lowest mean scores, obtained in various dimensions of satisfaction before and after intervention in both multimedia and control groups, were for signs and symptoms and for recommendations for reducing symptoms and complications, respectively [Table 2].

**DISCUSSION**

The results of our study demonstrated a significant difference in satisfaction between patients who received education on MS via booklet and patients who had had electronic-based education. An earlier study conducted on patients with cardiovascular disease showed that individuals who received computer-based education about their diet followed the regimen more rigorously.<sup>[8]</sup> Also, it has been demonstrated that using electronic-based education was more effective in teaching elderly patients about drug reactions.<sup>[9]</sup> Based on the results of the Mohamadirizi (2013) study, e-learning and booklet education led to increased satisfaction and awareness about prenatal care.<sup>[10]</sup>

However, in studies on patients with cardiovascular disease and benign prostate hypertrophy, no significant

**Table 1: Comparison of mean scores of patient satisfaction before and 2 weeks after intervention in multimedia and control groups**

| Satisfaction                  | Educational group                |           | T-test results                   |                 |
|-------------------------------|----------------------------------|-----------|----------------------------------|-----------------|
|                               | Electronics                      | control   |                                  |                 |
| Before intervention           | Mean±standard deviation          | 24.01±1.0 | 23/5±2.4                         | <i>P</i> =0.434 |
| 2 weeks after intervention    | 45/23±2/1                        | 36/16±1/3 | <i>P</i> =0.021                  |                 |
| Paired <i>t</i> -test results | <i>P</i> =0/005, <i>t</i> =-8.02 |           | <i>P</i> =0.001, <i>t</i> =-3.02 |                 |

**Table 2: Mean scores of patient satisfaction dimensions related to disease training before the intervention and 2 weeks after the intervention within two groups, i.e., electronic and illustrated booklet**

| Dimensions of satisfaction                              | Educational groups      |                    |                         |                    |
|---|-------------------------|--------------------|-------------------------|--------------------|
|   | Electronic              |                    | Control                 |                    |
|   | Standard deviation±mean |                    | Standard deviation±mean |                    |
|   | Before intervention     | After intervention | Before intervention     | After intervention |
| Explaining disease                                      | 6.3±2.1                 | 8.3±1.0            | 4.1±1.3                 | 7.2±1.3            |
| Causes  | 4.1±2.1                 | 6.3±1.1            | 3.6±1.2                 | 5.0±0.2            |
| Signs and symptoms                                      | 7.3±3.2                 | 10.8±2.5           | 7.2±2.6                 | 9.1±1.2            |
| Side effects  | 3.6±0.5                 | 6.2±0.2            | 3.3±1.8                 | 5.0±0.1.1          |
| Prognosis   | 2.4±1.2                 | 6.5±2.1            | 2.1±0/2                 | 5.1±1.1            |
| Treatment   | 2.5±1.5                 | 5.6 1.1            | 2.5±1.3                 | 6.7±3.3            |
| Benefits and side effects of the treatment              | 2.8±3.4                 | 7.5±2.1            | 2.4±1.3                 | 4.5±0.5            |
| Recommendations for reducing symptoms and complications | 1.4±0.2                 | 6.5±2.0            | 1.3±1.1                 | 5.7±1.0            |

difference was found between these two methods of teaching in terms of patient satisfaction.<sup>[11-13]</sup> It is possible that our findings were influenced by the fact that the data gathered for our study were self-reported by patients.

In electronic-based education, individuals learn how to learn. This method does not have any restriction in time and space, and the independence of individuals in the learning process can play a role in their satisfaction. As was previously demonstrated, a positive relationship exists between the satisfaction of people and the accessibility of a method. The individuals who live 100 miles away from a center of education and are over 40 years old cited the highest satisfaction from computer-based education. In addition, using this method people can learn about different subjects without any stress or hurry.

The electronic-based method has eight different dimensions and they are as follows: (i) description of the disease, (ii) causes, (iii) signs and symptoms, (iv) effects of disease on health, (v) prognosis, (vi) treatment, (vii) benefits and side effects of treatment, (viii) recommendations on how to alleviate the symptoms of diseases. Because some MS patients may suffer from problems such as diplopia, the benefit of this method is the fact that they can hear the instruction; for patients with movement disorder, the pace of the learning process can be adjusted to their needs.

Considering all the advances in medicine, the role of educating the patients using modern methods seems important. The time restrictions of health care staff and the stressful environments for patients can be the disadvantages of the electronic-based method, so it is suggested that appropriate action be taken in order for patients to be able to use this method at home.

## CONCLUSION

The electronic multimedia programs comprised an attractive education method. So this technology can increase motivation in MS patients to study and understand more about disease processes.

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