

Effect of computer learning on quality of life of Iranian asthmatic patients

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Introduction

Asthma is the most common chronic respiratory disease and a major health problem in most regions of the world (1, 2) with a prevalence of 40% in some areas. The prevalence of asthma in Iran is 7.5% but this estimate is higher in urban areas especially metropolitan areas (3). Asthma symptoms can disturb a patients' physical activity, quality of sleep, emotional functioning, and family life (4). These issues affect patients' Quality Of Life (QOL). Asthma cannot be cured when it occurs(5), moreover it is a chronic condition; therefore, promoting QOL is of importance to asthma patients.

As noted above, symptoms and signs are mainly responsible for destroying a patients' quality of life; therefore, proper management of these problems could be considered as a solution in this regard (6). Several studies on asthma patients have reported the effect of educational intervention on symptom alleviation, anxiety control (7), QOL promotion (7, 8), and self care (9). Gaining the ability of participating in daily physical activity and reducing the number of medical encounters and hospitalization (10) are among other beneficial effects of educational interventions on asthma patients. However, little is known about the effectiveness of computer learning programs on QOL especially in asthma patients. Therefore, the aim of present study was to evaluate the effect of an educational program based on computer learning methods on QOL of asthma patients.

Materials and Methods

A quasi-experimental study was conducted. A convenience sampling method was implemented to recruit 60 asthma patients from people who were referred to the lung clinics of Tehran University of Medical Sciences' hospitals (Tehran, Iran,

Abstract

Background: Asthma is a chronic condition which affects quality of life and is a major health problem in most regions of the world. Therefore, we assessed the impact of a computer learning program on asthmatic patients' quality of life.

Methods: A quasi-experimental study was implemented. Patients with asthma were randomly assigned to intervention and control groups. The intervention of this study was a computer learning program aiming to improve asthma patients' quality of life and was delivered to the intervention group. The control group received no training. Patients' quality of life in physical, psychological, economic, and general health dimensions was assessed using

the standard SF-36 questionnaire before, and three months after, intervention.

Results: Sixty patients were recruited to the study (intervention: n=30; control: n=30). In the intervention group, quality of life was significantly improved in physical (P=0.003), psychological (P=0.033), and general health (P=0.000) dimensions while comparing post-test to pre-test results; but there was no improvements in the economic aspect (P=0.202). In the control group, no significant difference was revealed between pretest and post test results.

Conclusions: Computer learning approach can be a useful method in promoting quality of life in patients suffering from asthma.

Keywords: Computer learning, Asthma, Quality of Life

May-December 2010). Participants were then randomly assigned to intervention (n=30) and control (n=30) groups. All participants should be asthmatic patients based on the physician's diagnosis, while no other concomitant chronic disease such as cancer, diabetes, and psychological disorders should be present; subjects were also to be in an age range of 18 to 65 years, be able to speak in Persian language, have basic reading/writing skills, and be able to work with the computer. Participants were excluded from the study if they experienced severe asthma attacks or other disorders which noticeably affected QOL; they were also excluded if they did not use the educational Compact Disc (CD) or the researcher could not contact them during follow-up time.

The intervention method was a CD which was delivered to the intervention group; the control group did not receive any education. Each patient in the intervention group received instructions on the application of the CD. The researchers prepared the CD and obtained its publication license from the Ministry of Culture and Islamic Guidance. Developing the CD, researchers first established the learning goal and identified the target population (asthma patients). The main educational goal was "to promote asthma patients' knowledge about asthma and its management". Achieving this goal, the educational content of the CD was developed in eight sub-titles, including:

- 1) definition and classification of asthma,
- 2) Prevalence of asthma,
- 3) Risk factors of the disease,
- 4) Signs and symptoms,
- 5) Exacerbating factors,
- 6) Medication in asthma and how to use supplement instruments of medication,
- 7) ways to prevent and manage the exacerbating factors, and
- 8) how to prevent, control, manage and treat asthma.

The CD was designed in the form of multimedia software, in which patients could choose the written

or the audiovisual format of the information. Furthermore, patients could double click on each sub-title to review it. Patients were followed for 12 weeks. The researcher arranged 3-4 phone calls during follow-up time to assure that all patients had used the CD and to answer patients' queries. Data was collected before and 12 weeks after intervention in both groups.

The questionnaire of the present study consisted of three parts: 1) baseline characteristics, including age, sex, marital status, educational level, employment, dependency for care at home, and tobacco/ alcohol use; 2) disease related information, including duration of the disease, number of medical encounters and hospitalization, severity of the disease, types of medication, symptoms of asthma (e.g. cough, wheezing, sweating, etc.), sexual problems, and digestive complications; and 3) QOL questionnaire, including four dimensions: physical (13 questions), psychosocial (14 questions), socio-economic (8 questions), and general health (four questions). One open-ended question was included at the end of the questionnaire assessing patients' satisfaction of and opinion about the educational CD.

Designing the QOL questionnaire, SF-36 and Asthma Quality Of Life Questionnaires (AQLQ) were used. Minor revisions in the content and face validity of the questionnaire were made by implementing the results of the consensus of 10 experts' opinions. Assessing the reliability of the QOL questionnaire, Cronbach's alpha coefficient was used which was 62% in the physical dimension, 84% in the psychosocial dimension, and 79% and 68% in socio-economic and general health dimensions respectively.

Comparing both groups regarding demographic and health related statistics, Pearson chi-square and Fisher's exact tests were used. Comparing both groups in terms of QOL, independent t-test was used. Paired t-test was implemented for the comparison of QOL before and

after intervention in each group. Spearman's correlation coefficient was used to assess the correlation between ordinal variables. Ethics committee of TUMS approved the research protocol. The aim of the study was demonstrated and written informed consent was obtained from all study participants. They were assured about the confidentiality of their information and free participation in the study. After finishing the post-test phase, the educational CD was delivered to the control group as well.

Results

At baseline, both groups were homogenous regarding baseline characteristics, health related information, QOL (Table 1 - next page).

Comparing pre-test/post-test results, no significant difference was shown in the QOL of the control group. In the intervention group, however, QOL was significantly improved in physical, psychological, and general health dimensions but was not improved in the economic aspect (Table 2 - page 51).

In intervention vs. control group, there was a significant increase in mean scores of physical ($P=0.002$), psychological ($P=0.001$), and general health ($P=0.000$) dimensions in the post-test phase. However, the socio-economic dimension did not improve significantly in this phase ($P=0.061$) (Table 3 - page 51).

Twenty one (70%) participants were completely and nine patients (30%) were moderately satisfied with the educational method in this study.

Discussion

Educating patients has been identified as a cornerstone in management of asthma; however, there are still ambiguities about the benefits of different teaching techniques (11). The results showed that computer learning improved the quality of life of asthmatic patients in physical, psychosocial, and general health dimensions. Improvement in the physical dimension might be the result of improvement in the

| Variable | Control n (%) (n= 30) | Intervention n (%) (n= 30) | P value |
|--------------------------------|-----------------------------|----------------------------------|---------|
| Age | | | |
| 18-25 | 6 (20) | 4 (13.3) | 0.32* |
| 26-45 | 13 (44) | 16 (53.3) | |
| 46-65 | 11 (36) | 10 (33.3) | |
| Sex | | | |
| Male | 14 (46.7) | 12 (42.4) | 0.071* |
| Female | 16 (53.3) | 18 (57.6) | |
| Marriage status | | | |
| Single | 4 (13.3) | 8 (26.7) | 0.110** |
| Married | 24 (80) | 21 (70) | |
| Widow/Widower | 2 (6.7) | 1 (3.3) | |
| Employment | | | |
| Unemployed | 2 (6.7) | 1 (3.3) | 0.063** |
| Homemaker | 16 (53.3) | 15 (50) | |
| Worker | 3 (10) | 6 (20) | |
| Employee | 3 (10) | 3 (10) | |
| Free job | 4 (13.3) | 1 (3.3) | |
| Other | 2 (6.7) | 4 (13.3) | |
| Educational level | | | |
| Elementary | 9 (30) | 6 (20) | 0.052* |
| Some schools | 4 (13.3) | 9 (30) | |
| Diploma | 13 (40) | 5 (16.7) | |
| Academic | 5 (16.7) | 10 (33.3) | |
| Duration of the disease | | | |
| < 1 year | 10 (33.3) | 9 (30) | 0.071* |
| 2 to 5 years | 13 (43.3) | 10 (33) | |
| 6 to 10 years | 4 (13.3) | 7 (23.3) | |

* Pearson chi square, ** Fisher Exact Test
Table 1: Frequency distribution of the baseline and health related characteristics of study participants

(Continued top of next page)

| | | | |
|-------------------------|-----------|-----------|--------------------|
| > 10 years | 3 (10) | 4 (13.3) | |
| Disease severity | | | |
| < 2 days/week | 16 (53.3) | 14 (46.7) | 0.091 [†] |
| > 2 days/week | 7 (23.3) | 5 (16.7) | |
| Daily | 2 (6.7) | 5 (16.7) | |
| Continuous | 5 (16.7) | 6 (20) | |

(Left: Table 1 continued)

| QOL dimensions | Control group | | | Intervention group | | |
|-----------------------|---------------|--------------|----------------------|--------------------|--------------|----------------------|
| | Pre-test | Post-test | P value ^o | Pre-test | Post-test | P value ^o |
| | Mean (SD) | Mean (SD) | | Mean (SD) | Mean (SD) | |
| Physical | 40.7 (6.9) | 42.1 (7.6) | 0.249 | 41.7 (6.8) | 45.9 (8.7) | 0.003 |
| Psychological | 43.2 (11.4) | 43.0 (8.8) | 0.424 | 44.4 (7.2) | 48.1 (7.9) | 0.033 |
| Socio-economic | 25.7 (6.7) | 25.6 (6.4) | 0.154 | 26.9 (5.9) | 28.2 (4.8) | 0.202 |
| General health | 11.7 (3.2) | 12.7 (2.8) | 0.900 | 12.2 (2.8) | 16.5 (2.5) | 0.000 |
| Total | 123.5 (19.5) | 122.6 (23.5) | 0.628 | 126.8 (25.3) | 138.9 (16.0) | 0.007 |

^oPaired t-test

Table 2. Comparison of the QOL between pre-test and post-test phases in control and intervention groups

| QOL dimensions | Intervention group | Control group | P value ^o |
|-----------------------|--------------------|---------------|----------------------|
| | Mean (SD) | Mean (SD) | |
| Physical | 45.9 (8.8) | 42.1 (7.6) | 0.002 |
| Psychological | 48.1 (7.9) | 43.0 (8.8) | 0.001 |
| General health | 16.5 (2.5) | 12.7 (2.8) | 0.000 |
| Socio-economic | 28.2 (4.8) | 25.6 (6.4) | 0.061 |

^oIndependent t-test

Table 3. Comparison of the QOL in post-test phases between control and intervention groups

the patients' perception of their ability to perform daily living activities. This is one of the perceptions which we tried to induct to the learners in our educational intervention. Bakhshandeh et al. (2004) concluded that breathing training facilitates daily living activities of asthmatic patients by enhancing their physical capacity which itself promotes their QOL (12).

Results also showed that our intervention improved the psychological dimension of QOL. Since participants obtained knowledge about the disease's nature and management, their self-esteem and sense of independency might be enhanced which itself can help them to "feel better". Molassiotis (1997) noted that feeling of self-control, self-assurance, and having a positive attitude toward the disease are important elements that affect patients' quality of life (13).

Results showed significant improvement in the general health dimension of patients in intervention group. Mezarous (2003) stated that educating patients with asthma helps a 40% improvement in scores of QOL in all dimensions (14). Moudgila et al (2000) reported the effect of education on improving all dimensions of QOL (15). In the research by Krishna et al. (2003), some information was delivered to the control group while in the intervention group, information was delivered through a multimedia animation CD as well as face to face education. The results indicated that the method of education applied for the intervention group led to an increase in knowledge about asthma and reduction of the number of emergency visits by physicians (16).

There was no significant correlation between QOL and demographic characteristics. Similarly, Naeemi et al (2007) found no significant correlation between demographic variables and QOL and anxiety (7). Only a significant direct association was found between educational level and QOL in which the increase in educational level led to an increase in QOL. Therefore, promoting educational levels, knowledge and

information might help improve the QOL in these patients.

Conclusion

Findings showed that the quality of life in asthmatic patients receiving computer learning can promote their quality of life in physical, psychological and general health domains but has no effect on the socio-economic aspect. Therefore, the research hypothesis "computer learning improves the quality of life of asthmatic patients" is accepted. These findings emphasize the necessity of effective education in managing asthma and improving quality of life in asthma patients. Further investigations are recommended for assessing the effect of computer learning on other aspects of asthma patients and on other chronic diseases.

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