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The Effect of Educating the Use of Spray by Visual Concept Mapping Method on the Quality of Life of Children with Asthma

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ABSTRACT

One of the most important goals in treating chronic diseases, especially asthma, is the promotion of quality of life (QOL). The present study aimed at identifying the effect of educating method on the QOL of children, who suffered from asthma.

In this clinical trial study, 80 children aged 6-12 years with asthma were divided into two groups: control (face-to-face method) and experimental (visual concept mapping method). The QOL of both groups was measured before and after educating by the Juniper's Quality of Life Questionnaire with a one-month interval.

The rate of change in the QOL score of the experimental group was 0.3 (±0.7) both before and after intervention and 0.1 (±0.3) in the control group, which was statistically significant ($p<0.05$).

Educating by the visual concept mapping method with regard to the manner of using sprays is taken into account as an efficient and effective method in improving the QOL of children with asthma.

Keywords: Asthma; Child; Quality of life; Visual Concept Mapping

INTRODUCTION

Among the ultimate aims of treating the chronic diseases, especially asthma, is to improve the patient's QOL.

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Therefore, the process of QOL has been suggested as a scale for measuring the usefulness of the medical services offered to the patients.[1] The QOL has a unique definition for each individual and is dependent on several factors such as patients' lifestyle as well as past experiences and their desires. The QOL for a child with asthma is defined as the intensity of disease, frequent visits to the doctors, absence from school and motion limitations.[2] In asthma, physical disability leads to sense of insufficiency in children and disturbs their self

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confidence. Consequently, they would suffer from anxiety and depression, ending with social isolation. Therefore, early diagnosis of asthma, proper treatment and providing patient education could result in controlling the progress of asthma and improving the QOL.[3] According to NAEPP's Guidelines in 2007, the ultimate goal of treating asthma is the reduction of mortalities, promotion of functioning and improvement of QOL.[4] Wolf et al found that patient education is a fundamental basis in managing asthma that leads to better outcomes such as an improvement of lung function, a reduction in referring to emergency wards and school attendance.[5] Patient education involves a cooperative trend between the nurse and the patient, which aims at promoting the capability in self care.[6]

Nowadays, the ultimate goal of patient education is the creation of change in life in order to gain more adaptability with the disease.[7] Hageni et al emphasized the role of nurses in patient education about asthma medications.[8] Studies have shown that only 50% of trained adults can use metered dose inhaler appropriately and in children, this percentage is even less.[9] Therefore, improper use of inhaler sprays might be one of the main reasons for lack of proper control of asthma. On the other hand, children's avoiding in taking their medications is one of the frequent problems expressed by the parents; they mention pharmacotherapy as one of the hardest items in caring of asthmatic children.[10]

As children with asthma cannot read and write properly in preschool and early school ages, so inventing an innovative method that does not need to be able to read and write is valuable. One of the techniques used these days in patient education, is the Visual Concept Mapping. Novak devised the concept mapping by reference to the Theory of Meaningful Learning of Ausubel (1968). Concept mapping is based on emphasizing the meaningful learning through disciplined organizing, connecting and adding of materials.[11] In this method, the data are both analyzed and organized. In the visual concept mapping, the concepts are instructed to the learner by using shapes. In this method, shapes are complements to oral explanations.[12] In fact, a visual concept mapping consists of small pieces, which are actually the concepts and are placed with interaction to each other in the total map.

The aim of this study was comparing the effectiveness of two education methods: the face to face and visual concept mapping, on the correct use of inhaler sprays and assessing their effects on children's QOL.

MATERIALS AND METHODS

This study is a randomized controlled clinical trial, which was conducted in two groups: The experimental group was educated by visual concept mapping method and the control group was educated by face to face method. All patients gave a written informed consent prior to the enrollment. We assessed the effect of two training methods on the QOL in 80 children with mild to moderate asthma, who referred to Asthma Clinic of Children's Medical Center Hospital. In this study, our researcher was present in the Asthma Clinic of Children's Medical Center Hospital. Each child was visited by physician and inhaler medications were prescribed. The researcher explained about the study for each child and his/her caregivers (mother or father). Then the children were asked to show how to use placebo inhaler with spacer. The range of total scores was 0-10. Getting the score of upper than 5, he/she was excluded from the study. Those who obtained scores lower than 5 were included in the study. The children were allocated randomly to the experimental (n=40) or the control (n=40) groups. In the control group, the correct method of using the spray was educated to the children and then the researcher filled in the Juniper's Pediatric Asthma Quality of Life Questionnaire (PAQOLQ) for them. One month later, again we asked them to show how to use spray and filled in the checklist and PAQOLQ. In the experimental group, we used the same method as above; expect that visual concept mapping was used to educate them. In the first visit, we gave them the visual concept maps and read it once for them. One month later, again we asked children to show how they used spray and filled in the check list and PAQOLQ.

The visual concept maps were drawn in the form of understandable diagrams. Each map included pictures showing how to use spray. They had 3-7 links, and have been prepared in two versions (boys and girls). The pictures were painted by the child books painter. The reliability of the checklist was examined via intra-observer reliability method, which was assessed by using the Pearson Correlation Test ($r_{=}0.71$) and Intra Class Correlation ($\alpha_{=}0.83$).

Table 1. Comparison of QOL scores and their mean differences in the control group both before and after the training

Domain / Topics	Activity	Symptom	Emotion	Total
Before	4.9(±1.3)	5.6(±0.7)	6(±0.8)	5.5(±0.6)
After	5.4(±1.2)	5.7(±0.8)	5.7(±0.8)	5.6(±0.6)
Mean difference	0.5(±0.7)	0.1(±0.3)	0.2(±0.3)	0.1(±0.3)
P value	<0.01	0.17	<0.01	0.46

Furthermore, in order to assess the QOL, Juniper's PAQOLQ was translated by Zandieh et al, and its reliability had been already approved [13]. This questionnaire consists of 23 items in three domains of activity (10 items), symptoms (5 items) and emotions (8 items). The questionnaire can be filled out either by the patients or the interviewer.[14] In this study, all of them were filled out by interviewer.

The inclusion criteria were having an age of 6-12 years, definite diagnosis of asthma, use of inhaling medications and finally, getting the score of lower than 5 of checklist.

This study was approved by the Ethics Committee of Baqiyatallah University. In order to analyze the scores, the statistical tests of Chi-square and the Independent and paired t-test were employed by the SPSS 15.

RESULTS

The subjects of this study included 59 boys (73.7%) and 21 girls (26.39%). The results showed that 38.7% of the subjects were 6-7, 32.5% were 8-9 and 28.8% were 10-12 years old. The Chi-square test did not show a significant difference in this regard. The average age of participants was 8.3 (±1.8) in the experimental group and 8.5 (±1.9) in the control group (p=0.68). The mean duration of asthma was 2.8 (±2.5) years in all subjects, which showed homogeneity between the two groups. The data analysis revealed that the total score of QOL was 5.5 (±0.6) in the control group prior to education and 5.6 (±0.6) after the education (Table 1). In spite of having statistically significant changes in the domain of activity and emotion, the amount of changes in the total score of QOL both before and after education was 0.1 (±0.3), which was not statistically significant (Table 1).

In the experimental group, the total score of QOL was 5.2 (±0.7) before education, which was reached to 5.8 (±0.6) after education. In addition, the children's QOL scores had noticeable changes in all of these domains and all of them were significant (Table 2).

The paired t-test indicated that the resulting changes have been significant both before and after the education in both groups (p<0.001).

Probing into the mean differential of QOL scores both before and after education in both groups indicated a significant difference between the two methods (p<0.001) (Table 3).

Regarding the use of correct inhaler technique, the score gained in the experimental group was 3.8(±1.8) before education and 9.5(±0.7) after education, which was statistically significant (p<0.001). Meanwhile, the score gained in the control group was 3.8(±1.6) before education and 6.7(±2) after education, which is not statistically significant (p=0.16).

The comparison of both groups indicated that the visual concept mapping method is more efficient and appropriate than the face-to-face method to educate children how to use the inhaler sprays.

Table 2. Comparison of QOL scores and their mean difference in the experimental group both before and after the training

Domain / Topics	Activity	Symptom	Emotion	Total
Before	4.2(±1.1)	5.1(±1)	5.7(±0.9)	5.2(±0.7)
After	5.2(±0.9)	5.8(±0.9)	6.8(±0.6)	5.5(±0.6)
Mean difference	1(±0.7)	0.6(±0.8)	0.6(±0.8)	0.3(±0.7)
P value	<0.001	<0.001	<0.001	<0.001

Table 3. Comparison of QOL scores mean difference in both groups according to distinct domains

Domain	Face to face mean difference B&A	Concept mapping mean difference B&A	*P* value
	mean (±SD)	mean (±SD)	
Activity	0.5(±0.7)	1(±0.7)	< 0.05
Symptom	0.1(±0.3)	0.6(±0.8)	< 0.001
Emotion	0.2(±0.3)	0.6(±0.8)	< 0.05
Total	0.1(±0.3)	0.3(±0.7)	< 0.05

This finding also had a logical relationship with the QOL scores (p=<0.001). The score gained out of the checklist was also higher and the effect of the education method was clearly observable both before and after the intervention. However, despite the increasing of QOL scores within the control group, these changes were not significant compared with the mean differential in both groups, and no significant difference was observed before and after the intervention in the control group.

DISCUSSION

This research showed that education by the visual concept mapping about the manner of using the sprays has had a more effective role in promoting the QOL of asthmatic children. The findings of this study indicated that different educating methods had a diverse effect on the QOL of patients. They also clarified the significance of selecting appropriate method for educating the patients. Walker et al also conducted a study on examining the effect of influential factors on rural children's QOL with an average age of 8 years. The researchers educated them by the workshop method and provided written pamphlets about various methods of asthma caring. Both before and after carrying out the education, the Juniper's QOLQ was filled out for them. The results showed the positive effect of training on the QOL of those patients.[2] Mcghlan et al conducted a research on training the children with an average age of 8.2 years using the Roaring Adventures of Puff (RAP) Method (a training program for children with asthma, aged 7-12 years with the aim of promoting their QOL and increasing the disease management capability).[15] They allocated the children into two groups of experimental (RAP) and control (ordinary educating in therapeutic centers) and showed that the education program, which is proportionate with the level of understanding of children and has more flexibility, will have a more positive effect on promoting their QOL.[16]

The findings of the present study and parallel studies indicated that not only patient education is necessary and significant but also the method used in this way is influential. Patient education has a critical role in this regard; however, the method of education has a more dominant role,[17] which in turn depends on age, interest and ability of the patients, because the final goal of education is not only learning but also changing the life style and improving the QOL.[2] The research conducted by Gacinuno, et al corroborated this point. Their findings showed that educating methods have different effects.[18] On the other hand, not all the patient education programs lead to improving patients' QOL.

In this research, we did not measure the effect of the maps in the self care and self confidence of children. Engaging children in care and cure of asthma can greatly affect the outcomes and decrease asthma exacerbation.[19] So we suggest future studies assess the effect of the use of visual concept mapping method in the other aspects.

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