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Designing and Assessing the Effect of Education Using "Child Care" Mobile Application on Knowledge, Performance, and Satisfaction of Parents of Children with Renal Disease

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Abstract

Background and Aim: Urinary tract infection is one of the most important diseases among children, which can lead to permanent damage to the renal parenchyma with the possibility of delayed complications such as hypertension or chronic renal failure. The aim of this study was to design and evaluate the effectiveness of education using the "Child Care of Kidneys" tool on the level of knowledge, practice and satisfaction of parents of children with kidney disease**.**

Methods: In this quasi-experimental study, 70 parents presenting to a pediatric nephrology clinic were enrolled in the study in 2020. Thirty-five parents received traditional training and 35 received face-to-face training by installing an Android mobile application. Subjects in both groups completed a questionnaire after 6 weeks and the data were analyzed using the SPSS software. The significance level was set at 0.05.

Results: The mean score of knowledge in both groups was 6 ± 1 (moderate). There was no statistically significant difference in the knowledge scores between the two groups (0.68). The performance score was 12 ± 2 (average) in the traditional training group and 13 ± 2 (moderate) in mobile app group. There was a significant difference in the performance scores between the two groups (0.02). The satisfaction score was relatively good in the application group.

Conclusion: Parent education through using mobile applications has a very good effect on the performance and satisfaction of the parents of children with kidney disease.

Keywords: Kidney Disease; Knowledge; Performance; Satisfaction; Widgets.

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Introduction

Technological advances play an effective and undeniable role in health care. Technological advances reduce the hospitalization rate and increase the quality of life of patients with renal failure. The patients have to use several methods of self-care. E-learning is one of the most effective and reliable methods for the development of individual or in-house training (1-3).

One of the educational methods is strategic programs to promote the use of information technology as an accessible and comprehensive teacher (4-5). With the development of communication technology, educational methods and e-learning have been considered in the health care system (6-7).

Several studies have investigated the use of educational simulation software in diabetic patients, indicating the positive effect of learning using the software (8-10). Considering the increasing use of new methods in medical education, there is a need to build software applications for parents of children with kidney diseases.

This study, which was conducted to evaluate the effectiveness of a mobile application in parental awareness and practice, underlines the importance and impact of using this technology in the process of educating patients and their parents.

Methods

This quasi-experimental study was performed on 70 parents (35 in the intervention group and 35 in the control group) of pediatric patients presenting with a urinary tract infection for the first time and were eligible for inclusion in the study. The inclusion criteria were high school education, having an Android mobile to install the e-learning app, not having medical and paramedical education or not being a health system employee, having a child with urinary tract infection and congenital problems without acquired diseases of the urinary system. The only exclusion criterion was unwillingness to participate at any time of the study.

The data collection tool was a researcher-made questionnaire whose validity and reliability were determined by the researcher. The subjects were divided into intervention and control groups. Traditional education was provided in the control group. In the intervention group, in addition to traditional education, a mobile application was installed the subjects' phones. After six weeks, the parents presented to the clinic again for the follow-up of urinary tract infection.

The parents' knowledge, practice and satisfaction were measured using a researcher-made questionnaire. Then, the collected data were analyzed using the chi-square test and paired t-test. The SPSS software was used for data analysis and the significance level was set at 0.05. This study was approved by the Research Ethics Committee of Tehran University of Medical Sciences. (Approval ID: IR.TUMS.VCR.REC.1397.286).

Results

In this study, 70 parents of children with urinary tract infection were examined. The results are presented in Table 1 and 2.

Table1: Comparison of two groups based on demographic characteristics

Variable		The first group (traditional teaching) Number (percent)	The second group (training applications) Number (percent)	Statistical test result *
Parent Sex	Male	8(23)	9(26)	P=0.5 X^2=0.78
	Female	27(77)	26(74)	
Education	elementary	2(5)	2(5)	P=0.91 X^2=0.12
	Middle School	6(17)	5(6)	
	Diploma	9(26)	9(26)	
	Bachelor's degree and higher	18(52)	19(63)	
Job	self-employment	20(57)	16(46)	P=0.33 X^2=0.92
	Employee	15(43)	19(54)	

Table 2. Comparison of two groups in terms of knowledge, performance and satisfaction scores

Variable	The first group (traditional teaching) Mean±SD	The second group (training applications) Mean±SD	Statistical test result *
knowledge	6.1±1.6	6.4±0.97	P=0.41 t=-0.83
Performance	12±1.8	13±1.2	P=0.02 t=-0.2.5
Satisfaction score (out of 60)	-	43.4±2.5	P<0.001**

*independent t-test ** One sample t-test

According to Table 2, the mean knowledge score was moderate in both groups. Moreover, according to the independent t-test, there was no significant difference in the mean knowledge score between the two groups (0.41). The mean performance score was also moderate in both groups. Furthermore, based on independent t-test, there was a statistically significant difference in the mean knowledge score between the two groups (0.02). The satisfaction score of the application users was relatively good.

Discussion

In this section, the research findings are discussed in relation to the personal characteristics of the research units and the specific and general objectives of the research.

The majority of the research units were in the age group of 36-40 years in the traditional education group (34.3%) and 31-35 years in the group using the application (42.9%), but there was no significant difference in the mean age between the two groups. chi-square test ($p = 0.75$) did not show any significant differences in age between the two groups.

The majority of the research units in the traditional education group (78%) and the group using the application (89%) had high school or higher education. However, in terms of education level, the two groups were almost similar and the chi-square test did not show any significant difference in the education level between the two groups ($p = 0.75$).

Therefore, the two groups were not statistically significant in terms of confounding variables affecting the results, including age and education level of parents, and were in fact similar. However, the mean age of children receiving traditional education (66.2 ± 17.9 months) was significantly higher compared to the age of children in the mobile app group (34.1 ± 12.1 months) ($p<0.001$). One of the possible reasons for the better performance of parents in the mobile app group may be the age difference of their children. The younger age of the children of the parents using the mobile app may be the reason why these parents paid more attention to the training resulting in better performance. Findings from the present study showed that the awareness level of 57% of parents in both groups was moderate and the mean knowledge score was 6.1 ± 1.6 out of 9 in the group receiving traditional education and 6.4 ± 0.97 in the mobile app group, indicating no significant difference in the mean knowledge score between the two groups ($p = 0.41$). This result was in line with a study by Borani et al. (11). One of the possible reasons for the lack of a significant difference in the knowledge score between the two groups could be lack of a significant difference in the education level between them. Most of the subjects in both groups had a high school education or higher, which enabled them to use the Internet and other educational resources to receive sufficient information.

Another possible reason for the lack of difference in the knowledge score between the two groups may be selection of all subjects from a center and their possible impact on one another.

The mean performance score was 13 ± 1.8 in the mobile app group and 13 ± 1.2 in the traditional education group, indicating a significant difference. This result was in line with a study by Ghazi Saeedi et al. that was conducted with the aim of designing and developing a mobile-based self-care application for patients with heart failure. The results showed the good performance of the group using mobile self-care services (12).

More, the results of a study by Nika Loti et al. showed that the use of mobile applications for education was effective in improving the performance of patients with stroke (13).

One of the possible reasons for the significant difference in the mean performance score between the two groups, despite the lack of a significant difference in the mean awareness score, may be installing the app on the cellphones that are carried by users all the time, making them more sensitive resulting in effective behavior and performance.

According to the results of this study, the mean satisfaction score of the application users was 43.3 out of 60; therefore, the satisfaction of these subjects was at a relatively good level, which was in line with the results of a study by Ghazi Saeedi et al. (12).

One of the reasons for satisfaction can be the use of technology and the attractiveness of the application-based education, which causes more attention to the educational resulting in higher satisfaction. The second reason may be easy access to the necessary training since parents can easily receive the necessary training through their mobile phones. There was no significant difference in the contextual and demographic variables between the

two groups, indicating the insignificant role of confounding factors.

Conclusion

Training parents using a mobile application had had a very good effect on the performance and satisfaction of parents of children with kidney disease; therefore, the use of this application in the field of parent education is strongly recommended.

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Conflict of Interest

The author declares no conflicts of interest.

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Ethics

This study was approved by research ethics committee of Tehran University of Medical Sciences.
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