

# Patients' Perceptions of Applying Information and Communication Technology Tools in Self-care and Factors Affecting It

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## ABSTRACT

**Introduction:** In recent years patient self-care has emerged as an important component of disease management programs. The ICT tools facilitate the self-care process with improved access to information resources, effective communication between patients and healthcare professionals, and social support services. **Aim:** The purpose of this study was identifying the perception of patients from the application of information communication technology in self-care in educational centers of Urmia University of Medical Sciences. **Material and Methods:** This is a descriptive cross-sectional study conducted in 2018. The studied population consisted 540 hospitalized patients from educational hospitals affiliated to Urmia university of medical sciences. For data collection, a self-designed questionnaire was developed which valid and reliable instrument to be measured. The statistical analysis of data was done using the SPSS Software. **Results:** more patients' interest to use of ICT tools in case of social media (34%), computer-based (25%) and the most common applications ICT tools included patient education (34%) and searching health information (23%). The most factors effective in the usage of ICT tools by patients were related to ease of using ICT tools (4.82), ICT tools reliability (4.73) and design ICT tools based on patient needs and preferences (4.68) respectively. **Conclusion:** The ICT tools are critical to patient self-care. To encourage more ICT adoption, patients should be made aware of the benefits of ICT and active involvement in the process of technology development. It seems necessary; ICT tools should be designed user-friendly, easy to use, reliable and usable.

**Keywords:** information technology, self-care, patient education.

## 1. INTRODUCTION

Because of transfer in the diseases approach from acute to chronic and also shift the patient care environment from hospitals to the home, organizations providing healthcare services understanding that the patient should carry out the necessary actions continuously for self-care (1-3). For active involvement patients in the care process, they must be gaining appropriate knowledge and skills of self-care (4). In recent years patient self-care has emerged as an important component of disease management programs (5). Indeed, self-care is defined as ability of patients to manage their treatment; accept accountability for health behaviors and change lifestyle for compatibility with a chronic condition (4-6).

Information communication technology (ICT) tools can support interventions focusing on self-care (7). The ICT tools facilitate the self-care process

with improved access to information resources, effective communication between patients and healthcare professionals, and social support services (8-10).

The patients with chronic diseases face many challenges in living because of complexity their specific conditions. They need to gain additional information to know more about their disorder, risk factors, the various treatment, manage daily life and behavioral changes (11, 12). Therefore, the chronically ill patients should be received effective education and reliable information sources for changing the lifestyle and monitoring diet and activity in their self-care (12-14).

Several studies have demonstrated that the use of ICT-based self-care had a positive impact on clinical outcomes, patients' ability to learn, self-care management, and skill development (13-16). The use of ICT tools to create mul-

timedia learning environment can be adapted to meet their individual learning needs of patients (17). Indeed ICT tools have potential to enhance active role of the patient involvement in the decision-making process and self-efficacy (7). Undoubtedly, patients should be gaining skills in applying ICT tools and also access to them.

The applications that patients can use ICT tools in the field of health include: schedule appointments, renewing the physician prescription, receiving the results of tests, searching health information, managing personal health information, their relationship with the physician, monitoring medical problems and send reminders and alerts (18-20).

The results of the several studies have shown that IT tools can enhance patients' health knowledge, encourage patients to ask more questions during doctor visits, choice better life-style, increase adherence doctor advice, facilitate communication between healthcare professionals and patients or family members, improve patients' ability to manage their disease and promote patient autonomy (19-22).

In a survey conducted by the American Medical Association, 70% of physicians were using the Internet, whereas 25% were using e-mail to communicate with their patients (23).

In another study, 84% of the patients would like their doctors to be able to access and monitor their laboratory tests online, 83% to follow-up after the visit and 81% to receive reminders for preventive care (24).

Both patients and providers preferred electronic communication to send and receive messages and link to educational materials (25).

Nowadays related ICT devices (computer-based, web-based, smart phone apps, social media, etc.) are increasingly being integrated as a means of improving healthcare services delivery and patient self-care (19-23).

The purpose of this study was identifying the perception of patients from the application of information communication technology in self-care in educational centers of Urmia University of Medical Sciences.

## 2. MATERIALS AND METHODS

This is a descriptive cross-sectional study conducted in 2018. The studied population consisted of hospitalized patients from educational hospitals affiliated to Urmia university of medical sciences which were 530 individuals in total. For data collection, a self-designed questionnaire was developed. The questionnaire included information on respondents' demographic (gender, age, educational level, marital status, employment status, cause of hospitalized, availability of IT tools and place of residence). The second part identified IT skills, usage rate of IT tools and also interest to use of IT tools types, in the final part, perception of patients from application of IT tools in self-care and also factors affecting in usage of IT tools determined through a five-point Likert scale (from strongly agree to strongly disagree). The validity of the instrument was evaluated using the content in the valid scientific texts and comments of a group of different experts (including medical informatics, nurses and medical educational professionals). The determination of reliability was undertaken using the Cronbach  $\alpha$  coefficient that value it for the total questionnaire 0.85 obtained. The statistical analysis of data was done using the SPSS Software (version 16).

## 3. RESULTS

Total amount of 530 questionnaires were distributed out of which 426(80.4%) were completed and returned. 59.6% of respondents were female and their mean age were 49.3, most respondents' educational degree (40.4%) were Diploma. 74.6% of patients married and 45.3% unemployed. The most common cause of hospitalization, were heart disease (25.6 %) and diabetes mellitus (21.6 %). More than half respondents (57.5%) had moderate access to IT tools and 73.9% of them resident in urban (Table 1).

Characteristics	Related cases	N (%)
Gender	Male	172 (40.4)
	Female	254 (59.6)
Age (years)	<30	45 (10.6)
	30-40	62 (14.5)
	40-50	88 (20.6)
	50-60	128(30)
	≥60	104 (24.4)
Educational level	Illiterate	52 (12.2)
	Elementary School	86 (20.2)
	High school(Diploma)	172 (40.4)
	University	116 (27.2)
Marital Status	Married	318 (74.6)
	Single	45 (10.6)
	Divorced, widowed	63 (14.8)
Employment status	Employed	170(39.9)
	Unemployed	193(45.3)
	Retired	63 (14.8)
Cause of hospitalization	Heart disease	109 (25.6)
	Diabetes mellitus	92(21.6)
	Cancer	83 (19.5)
	Kidney disease	67(15.7)
	Other	75(17.6)
Availability of IT tools	Low	123 (28.9)
	Moderate	245(57.5)
	High	58 (13.6)
Place of residence	Urban	315 (73.9)
	Rural	111 (26.1)

Table1. Demographic characteristics of patients (N = 426)

Effective factors	Mean	SD
IT skills of patient	4.32	0.87
Patient access to ICT tools	4.43	0.69
Perceived usefulness of ICT tools	4.20	0.91
Patient education for using ICT tools	4.34	0.78
Design ICT tools based on patients' needs and preferences	4.68	0.55
Ease of using ICT tools	4.82	0.41
Potential benefits of ICT tools	3.96	0.98
Culture-making fit	4.25	0.86
Technical support on how to use ICT tools	4.18	0.96
Usability of ICT tools	4.40	0.71
Integrating ICT tools into the healthcare services provider	4.52	0.65
ICT tools reliability	4.73	0.46
Patient compatibility with ICT tools	4.28	0.83
Motivation to use ICT tools	4.36	0.79
User-friendly of ICT tools	4.12	0.95
Feeling the need to use ICT tools	4.18	0.89

Table 2. Factors affecting in usage of ICT tools by patients (range 1-5)

In terms of IT skills more respondents were in fundamental (38%) and intermediate (30%) levels. More patients interested

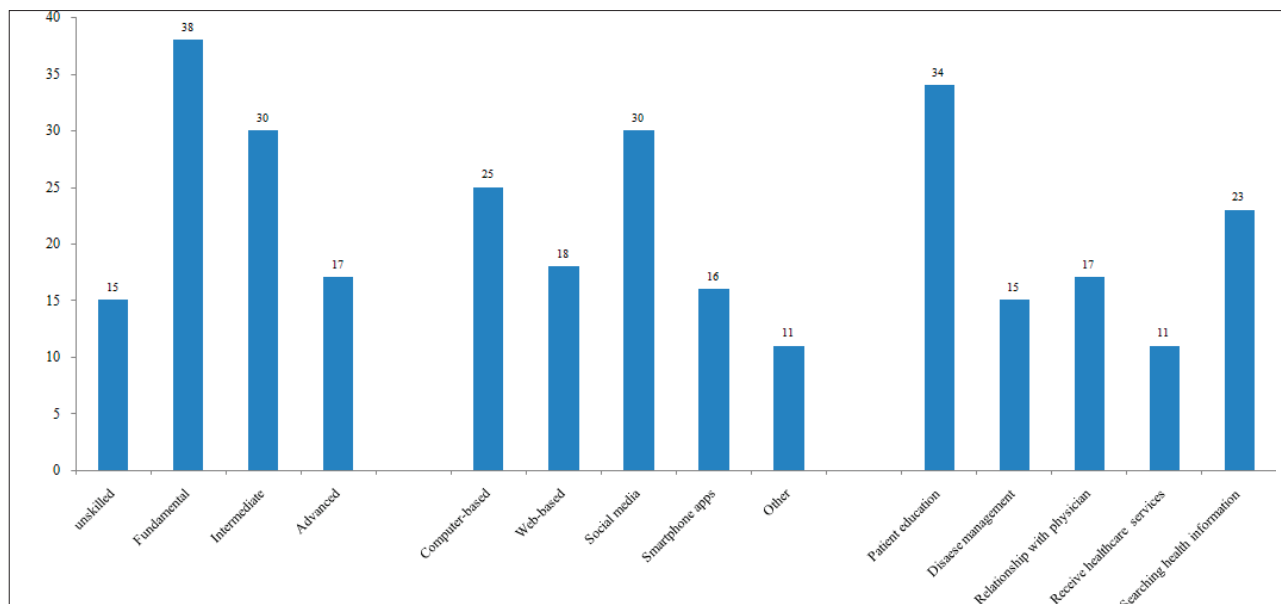


Figure 1. Patients perception of their IT skills, interest to use of ICT tools types and ICT tools applications (%)

to social media (30%) and computer-based (25%). The most common applications ICT tools in healthcare were include patient education (34%), searching health information (23%) and relationship with physician (17%) (Figure 1).

The most factors affective in usage of ICT tools by patients were related to ease of using ICT tools (4.82), ICT tools reliability (4.73), design ICT tools based on patients' needs and preferences (4.68), integrating ICT tools into the healthcare services provider (4.52) and patient access to ICT tools (4.43) respectively (Table 2).

#### 4. DISCUSSION

Results this research showed that more patients' interest to use of ICT tools in case of social media (34%), computer-based (25%) and the most common applications ICT tools were include patient education (34%) and searching health information (23%). The most factors affective in usage of ICT tools by patients were related to ease of using ICT tools (4.82), ICT tools reliability (4.73), design ICT tools based on patient needs and preferences (4.68) and integrating ICT tools into the healthcare services provider (4.52) respectively.

The study by Alarcon et al (2006) presented 76.4% of patients had a computer at home and 72% had Internet access. 42% looked for health information on the Internet. 70% of patients would be interested in a specific web page on their disease topics and 75% would use e-mail to consult with their physicians (26). The findings of our study indicated that 71% of patients had high and moderate access to ICT tools and 30% interested to use of social media. Also more patients used ICT tools in terms of learning (34%) and searching health information (23%).

Santana and Pereira (2007) in a study examined the use of the Internet for health and disease in Portugal, which showed that 82% of patients tended to receive test results, 68% renew the prescription, 54% for instructions about treatment and 23% receive information about drug orders (27). Our results indicated that more patients' interest to use of ICT tools in patient education (34%), searching health information (23%) and relationship with physician (17%).

Findings of the study by Hagen et al (2017) showed that

most patients believed that the use of ICT tools improve healthcare and easy access to needed information, but less preferences to use internet-based therapies in case of mental health problems (28). Our results match the findings of this study, indicated that patients' attitudes about the use of ICT tools to readily available health information sources and patient education were mostly positive but they have lower trend to use ICT tools in receive of treatment services and disease management.

The results of the study, Calvin KL Or et al. (2010) in Hank Hong, showed that perceived usefulness, perceived ease of use, subjective norm, and health care knowledge were the most important factors in accepting patients for using web-based technology. Also patients believed that using the technology would increase their ability and effectiveness in handling their disease (29). Kerr et al (2006) noted that ICT tools should be simple and easy to use, user-friendliness and in line with patients' needs and preferences (30). Our results showed that easy to use, ICT tools reliability, design based on needs of patient and integrating ICT tools into the healthcare services delivery, the most important factors for using of ICT tools by patients.

#### 5. CONCLUSION

To successfully self-care, patients require appropriate support to education about manage their problems and find new ways to live with a chronic illness, since they do not have access to their physician and nurse after discharge, therefore, it is important to meet the learning needs of patients. The ICT tools are critical to patient self-care. To build useful ICT tools for patients, the healthcare providers must be required to expand strategies for patient accessible ICT tools and adequately focused on needs and preferences of patient.

To encourage more ICT adoption, patients should be made aware of the benefits of ICT and active involvement in the process of technology development. It seems necessary ICT tools should be designed user-friendly, easy to use, reliable and usable.

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- **Authors contributions:** MJ and ZZ were the responsible for the study design, data analysis, interpretation of results and writing the manuscript.

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