

Health information technology and health care activists: Where is the place of Iranians?Mobina Ghoochani¹, Mehdi Kahouei², Morteza Hemmat³, Hesamedin Askari Majdabadi⁴, Ali Valinejadi⁵

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Type of article: Original**Abstract**

Background: The level of knowledge and using health information technology by clinicians, students and staff has always been one of the essential issues in the field of health.

Objective: The objective of the present study was to evaluate HIT knowledge, attitude, and practice habits among health care professionals and students in educational hospitals in Iran.

Methods: This case study was carried out in 2016 on 539 personnel of 65 educational hospitals in Iran entailing three subgroups of physicians (n=128), medical students (n=97), and health record staff (n=314). A pretested self-administered questionnaire was designed to evaluate the knowledge, attitude and practice of health information technology. It was comprised of three parts of "baseline general characteristics", "knowledge categories", and "attitude and practice".

Results: In total, 28.8% of participants had a good level of knowledge about computer science, whereas 37.7% had a poor level of knowledge. A total of 40% showed good attitude and practice, while 25.6% had poor attitude and practice. Furthermore, 16.4% of physicians, 32% of students and 33.1% of health record staff had good knowledge, while poor knowledge was reported in 45.3% of physicians, 25.8% of students, and 37.6% of staff (p=0.304). The trend of good attitude and practice habits were respectively 28.9%, 50.5%, and 40.8% in physicians, students, and staff, whereas these trends were respectively 30.5%, 4.1%, and 29.9% for poor attitude and practice (p=0.163). Generally, the knowledge level of participants was positively related to the rate of attitude and practice (r=0.847, p<0.001), so the higher knowledge level brought about the higher score in attitude and practice.

Conclusion: The level of knowledge and practice of HIT was low among the physicians, students, and staff. Our university can provide a plenary program to promote the level of knowledge and information on practice of HIT.

Keywords: Medical informatics, Health staff, Physicians, Students, Hospitals, Educational

1. Introduction

Technology is developing rapidly, so it will specifically affect the health domain. In addition to being able to improve health care outputs, information technology (IT) can positively affect the relationship between health care

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professionals and patients (1, 2). Health information technology (HIT) means various communication and information technologies that are used to collect, save, transfer and display the patient's data (3). It is also a concept that describes the use of computer systems for accessing health care information by patients, health care providers, insurance companies, and other governmental organizations (4). This technology entails a variety of products and services such as Electronic Health Records (EHR), Tele-health, Mobile Health (m-health), tele-monitoring tools, assistant technologies and sensors. Collecting, sharing and using health information for individuals and health care providers, public health institutions and NGOs would be possible by using all the mentioned technologies (5, 6). Health information technology (HIT) embraces a wide range of information and communication technologies that are used to gather, transfer, save, and display the patients' data (3). This notion encompasses a broad diversity of products, technologies, and services such as remote and mobile health technology, cloud-based services, medical devices, tele-monitoring tools, assistant technology, and sensors (7). The potentialities of HIT are as follows: improving the quality, efficiency, outcomes and patient's safety, and reducing the cost of health care (8). By using HIT, health information would be accessible for patients, health care providers, insurance companies, and other governmental agencies. It would also reduce medical errors, costs, and paperwork, while it would increase efficiency, quality of health care, and empowerment of patients and health care professionals (4). To attain these advantages, the acceptance of HIT use is one of the key factors (9). Nevertheless, the acceptance of HIT is very low in most nations (8). More deployment of physicians in HIT makes hospital managers improve the HIT implementation process and increase practice of HIT (10). In Iran, as a developing country, less than half of the students know of the numerous advantages of using IT in research and training and very few of them take advantage of these benefits as educational aids (11, 12). In order to motivate students to use IT in all educational and research aspects, it is needed to inform them about various aspects of using it; however, there is not enough information about knowledge and practice patterns of students, and also there are no published or official reports on the knowledge and practice patterns of using IT among health care professionals in Iran. Therefore, the present study aimed to evaluate HIT knowledge and practice among the students and personnel of an educational hospital in Iran. In 2004, Bello carried out a survey on knowledge and practice of IT among health care workers and students in Ile-Ife (13). Another survey was done by Mohammed et al. on health care professionals in Addis Ababa hospitals, Ethiopia (14). Gour and Srivastava have studied computer knowledge among health care workers of India (15). Another study was done by Srivastava et al. in 2014, on the viewpoint of learners about the role of IT in higher education (16). Glinkowski, Pawlowska and Kozlowska have surveyed the perception and knowledge of tele-health and tele-nursing among university students of nursing in Poland (17). In addition, the study of Butali et al. was on the use of IT among dental students and resident physicians (18). In a case in 2015, Baraka et al. assessed the acceptance and knowledge of IT in health care practice (19), while Sinha and Shetty studied the attitude of physicians towards the efficiency of HIT in Ayurveda educational hospital (20). Another study was done by Buabbas et al. in 2016 entitled "Health Sciences Students' Self-Assessment of Information and Communication Technology Skills and Attitude Toward e-Learning" (21). Manganello et al. also assessed the relation of health knowledge and using IT (22). Moreover, Shih fulfilled a study about attitude and perception of nurses towards HIT and their effects on the practice (2).

2. Material and Methods

This case study was conducted on both medical students who had passed at least two academic semesters and also on health care professionals with various academic levels, working in 65 referral educational hospitals in Iran in 2017. The subjects included 539 hospital staff assigned into three subgroups of medical doctors (n=128), medical students (n=97), and health record staff (n=314). The Institutional Ethics Committee approved the study protocols. After describing the practical details of the project to participants, informed consent was obtained from all of them. To assess the subject's knowledge and practice of IT, a pretested self-administered questionnaire was given to subjects including three sections of "baseline general characteristics", "knowledge categories", and "attitude and practice". The sections of information knowledge, and attitude and practice information consisted of 19 and 16 questions respectively which were scaled as good, fair, and poor. To attain knowledge level towards IT, the score of more than 80% was scaled as good knowledge, between 60% and 79% was scaled as fair knowledge, and less than 60% was scaled as poor knowledge. Also, for determining attitude and practice state, the level of more than 60% was scaled as good knowledge, between 50% and 59% was scaled as fair knowledge, and less than 50% was scaled as poor knowledge. The reliability of the questionnaire was determined by researchers through achieving an acceptable reliability of Cronbach's alpha (0.83). Moreover, the content validity was determined by a nominal group of five experts using professional judgment by obtaining a validity level of 0.85. For statistical analysis, the results were presented as mean \pm standard deviation (SD). Categorical variables were compared using Chi-square test, and continuous variables were compared using T-test. The statistical software IBM© SPSS© Statistics version 21

(IBM© Corp., Armonk, NY, USA) was used for the statistical analysis. Furthermore, P values of 0.05 or less were considered statistically significant.

3. Results

The response rate to the questions was 87.8% (539 out of 614) including 128 physicians, 97 students, and 314 staff. The overall age of subjects ranged from 25 to 57 years among which, 297 were male and 242 were female. The average ages of physicians, students, and staff were respectively 37.11±4.34 years, 24.70±2.46 years, and 33.21±4.34 years with a significant difference among them (p=0.014). Regarding gender distribution, the frequency of male gender was 80.4%, 56.0%, and 32.9% respectively with a significant difference (p<0.001). Also, 87.8% of physicians, 26.0% of students, and 64.7% of staff were married (p<0.001). Considering the experience of computer training, 52 physicians (40.6%), 73 students (75.3%), and 195 staff (62.1%) had history of passing different courses of computer training. Among respondents, 77.1% owned a computer. A total of 27.9% of responders had a good level of knowledge towards computer science, while a poor level of knowledge was revealed in 28.2%. Also, 41.1% had good attitude and practice habits, whereas 24.8% exhibited poor attitude and practice. As shown in Table 1, there was no significant difference in the level of knowledge towards IT between physicians, students, and staff; therefore, good knowledge was respectively found in 16.4%, 32.0%, and 33.1% and poor knowledge was also observed in 45.3%, 25.8%, and 37.6%, respectively (p=0.304). Regarding attitude and practice habits, 28.9% of physicians, 50.5% of students, and 40.8% of staff had good attitude and practice habits, while poor attitude and practice habits were revealed in 30.5%, 4.1%, and 29.2%, respectively (p=0.163). As illustrated in Figures 1 to 3, overall, the level of knowledge was positively associated with the score of attitude and practice (r=0.847, p<0.001), whereas the higher knowledge level was related to the higher score of attitude and practice. This direct association was also found in three subgroups of physicians (r=0.815, p<0.001), students (r=0.779, p<0.001), and staff (r=0.878, p<0.001).

Table 1. Knowledge, attitude and practice habits in physicians, students and health recorder staff

Group		Total (n=539)	Physicians (n=128)	Students (n=97)	Staff (n=314)	p-value
Knowledge	Good	155 (28.8)	21 (16.4)	31 (32.0)	104 (33.1)	0.304
	Fair	181 (33.6)	49 (38.3)	41 (42.3)	92 (29.3)	
	Poor	203 (37.7)	58 (45.3)	25 (25.8)	118 (37.6)	
Attitude and Practice	Good	217 (40.3)	37 (28.9)	49 (50.5)	128 (40.8)	0.163
	Fair	184 (34.1)	52 (40.6)	44 (45.4)	92 (29.3)	
	Poor	138 (25.6)	49 (30.5)	4 (4.1)	94 (29.9)	

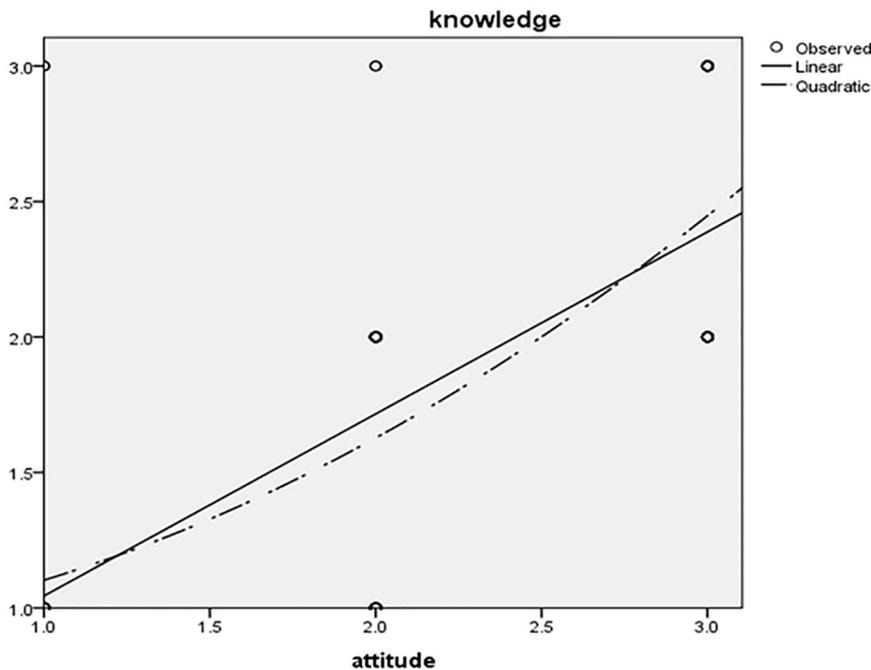


Figure 1. Association between knowledge and attitude in physicians

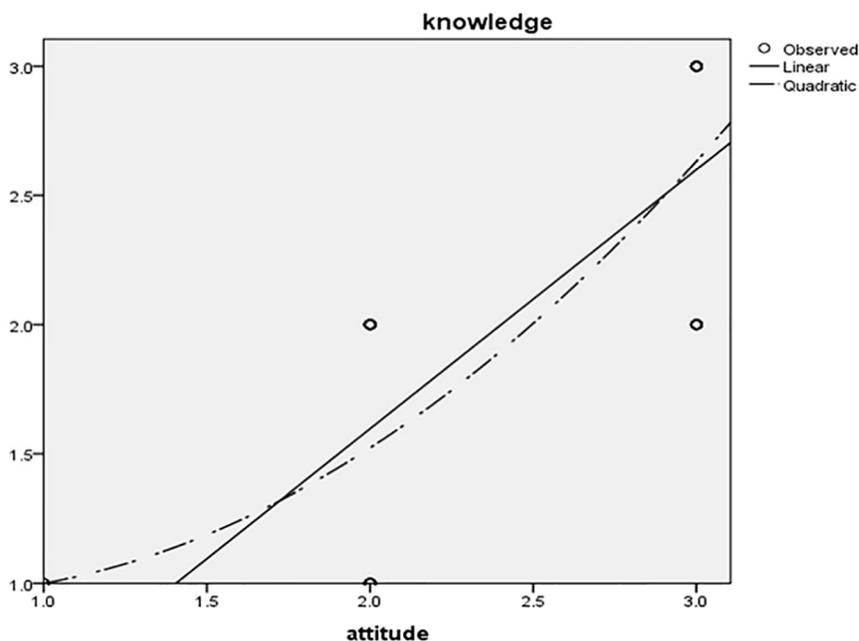


Figure 2. Association between knowledge and attitude in students

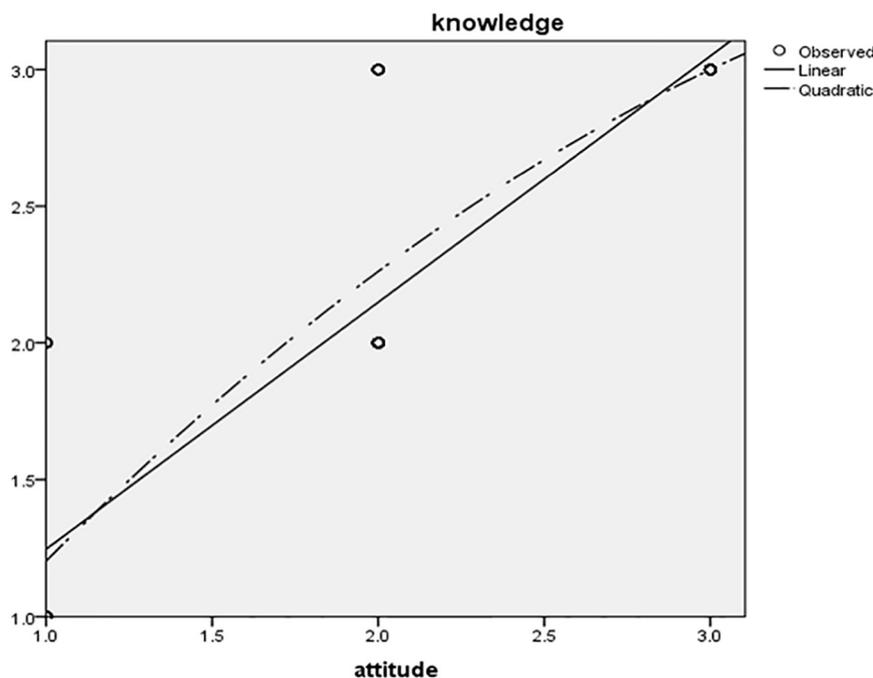


Figure 3. Association between knowledge and attitude in staff

4. Discussion

The present study had some significant points. First, the experience of passing computer courses was considerably different among the three subgroups of physicians, students, and staff, whereas it was more revealed in students followed by staff and physicians. It is probably due to more opportunities for students and staff to participate in computer courses, and also their situational needs required to learn computer skills in these two subgroups, whereas the students need to have this skill for educational and research requirements and the staff need to have computer skills due to the necessity of administrative activities such as data entry and management. On the whole, computer possession and practice among health care professionals and students were low. Despite the fact that most of the

respondents owned a computer, only a small number of subjects in three subgroups had acceptable knowledge and practice habits. This is close to the findings of similar studies (13, 14). Bello et al. (13) found that only 18.9% of professionals and medical students had good computer knowledge while 58.8% had average knowledge and 22.3% showed poor knowledge. Mohammed et al. (14) discovered that only 33.7% of the health care workers had adequate computer knowledge. In a research carried out by Buabbas et al., the self-assessed results of students showed that initially, their level of HIT knowledge was low and only 9.29% of them have used computers professionally (21). In contrast to our findings, Gour and Srivastava (15) reported that 57.91% of health care professionals had knowledge about computers.. A study by Baraka et al. declared that 80.9% of participants had full or almost full training for using the Internet and IT applications. (19) Furthermore, Sinha & Shetty who reviewed physicians' attitude towards HIT, concluded that the attitude of 75-80% of physicians in Ayurvedic Hospital was positive towards all kinds of health information technologies. (20) Glinkowski, Pawlowska and Kozlowska discovered that the definition of tele-medicine was known by 82% of nursing students in Poland. However, in our study, 32.3% of medical students had good knowledge, while 50% showed good practice patterns which were in compliance with other findings (13, 14, 18). In a study by Manganello et al., it was found that the use of HIT had a direct correlation with the level of health education, whereas the higher use of HIT was related to higher health education and the lower use of HIT was related to lower health education (22) Generally, the level of knowledge and attitude should be higher than the level obtained in our study.

5. Conclusions

Although the practice and knowledge about HIT among a number of physicians, students and staff in Iran was good, generally the rate of technology knowledge and practice seemed to be poor. This could be due to the lack of structured training and computer accessibility. Hence it is suggested that the university provide computer access for physicians, students and staff. Moreover, by reinforcing the educational infrastructures, the possibility of increasing knowledge of HIT among physicians, students and staff will be provided.

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Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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