




Comparing the Familiarity of the Basic and Clinical Faculty Members of Iran University of Medical Sciences with the Principles of Digital Professionalism

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Abstract

Background: Due to the changing conditions of education, research, and treatment in the world, especially the recent pandemic, and more use of virtual space, there is a need for evaluation of digital professionalism in faculty members as the most influential people who have a direct and deep impact on the next generation.

Methods: In this analytical cross-sectional study that was conducted in 2023 on 149 faculty members of Iran University of Medical Sciences, they were invited to participate in the study through various methods (SMS, E-mail, and media messages). The link to the Persian standardized questionnaire was made available for participants. If a person received less than 70% of the score in each area, he/she would receive solutions to improve his/her situation in that area at the end of answering the questions. The self-administered questionnaire has 5 fields and 33 questions. Maximum scores were 10 points. Spearman and Pearson correlation coefficients and statistical tests consisting of chi-square, t-test, Mann-Whitney U, one-way ANOVA, and Kruskal-Wallis H were used in the analysis.

Results: The mean overall score of people in principles of digital professionalism was 0.8. Women and basic sciences faculties had a significantly better status than men and clinical faculties in the principles of digital professionalism as a whole ($P = 0.001$ and $P = 0.049$, respectively). The domain of “knowledge management and information literacy” had significantly lower scores in professors in comparison with other degree (instructors, assistant professors, and associate professors ($P = 0.039$)).

Conclusion: The mean score of the principles of digital professionalism is acceptable at 80%. Coherent, timely, and up-to-date training to ensure the effective, safe and appropriate use of digital technology, especially for men, professors and clinical faculty members who had a lower score than others, should be done.

Keywords: Digital Professionalism, Faculty members, Basic sciences, Clinical sciences.

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Introduction

Conditions of education, research, and treatment in the world, especially after the recent pandemic, have been greatly changed toward more usage of virtual space. Faculty members, as the most influential people with a direct

and deep impact on the next generation, have not been evaluated for their potency in digital professionalism. Digital technology can improve the educational quality of teachers leading to better teaching. Familiarity of teachers

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↑What is “already known” in this topic:

The digital professionalism of faculty members has not been studied widely. However, different questionnaire have shown moderate to relatively high awareness of this population in this regard.

→What this article adds:

Academic members of Iran University of Medical Sciences have a high degree of digital professionalism but with wide variability in different domains and subdomains. Clinical faculty men with professor degrees had lower scores in comparison with basic sciences women with assistant/associate professors.

with technology and merging this in education is a priority (1).

Digital competence is a combination of skills consisting of information, communication, content creation, safety, and problem-solving skills (2). Legal and ethical issues should also be considered (3).

Previous studies in the field of digital professionalism have designed questionnaires to measure the digital ability of teachers (4), professionalism in the use of cyberspace in medical sciences (5), measuring digital skills (2) and the digital ability of faculties in Spain (6). We selected the most related questionnaire as our measuring tool for digital professionalism, which was designed for medical sciences and standardized in the Persian language for Iranian nationality people (5).

In previous similar questionnaires, areas such as general, professional interaction, digital resources, teaching and learning, assessment, empowering learners, and facilitating the digital capabilities of learners (6) or factors such as functional components, information navigation, social, creativity and usage of mobile (2), as well as compliance with the rules and regulations governing cyberspace, individual professionalism in using cyberspace, knowledge management, and information literacy, respect for professionalism in interpersonal and group rules, and compliance with ethics in the use of virtual space (5), in addition to information and information technology literacy, communication and collaboration, creating digital content, security, and troubleshooting and problem-solving (4) are also mentioned.

Other studies have mainly investigated this field among students of different educational courses (7-10) or nurses (11), and less research has been done on university professors in this field in the world. In Iran, no similar study was found on faculty members.

To understand which domains of digital professionalism need to be educated for faculties, which subgroups (given age, gender, academic level, degree, work experience, and faculty) of these populations need more attention, and how much total awareness of faculties we run this study.

Methods

This analytic cross-sectional study was conducted among the faculty members of the basic and clinical science departments of Iran University of Medical Sciences in 2023. Using convenience sampling, all faculty members of different faculties were invited to voluntary fill out an online questionnaire. The link to the Persian standardized questionnaire was made available by two separate SMS messages sent to all working faculty members (non-retired) in the university with an interval of two weeks. Another message was also sent to all academic staff members through national (Bale) and international (WhatsApp and Telegram) media messages. Moreover, an e-mail was sent to all academic staff members to ensure that they received the message of invitation to participate in this survey.

In order to increase the professors' motivation to participate in the study, an online analysis of individual results was done for each person, and if a person received less

than 70% of the score in each factor (based on the self-reported score he/she gave himself/herself), solutions to improve his/her situation in that field received at the end of questions. In this way, we reached the main goal, which was to improve familiarity with the principles of digital professionalism, in addition, to an increase in response rate, which in turn may decrease non-response bias specifically by persons who are not so familiar with the digital professionalism. So, it can decrease overestimation (bias) of the level of awareness of faculties about digital professionalism.

In order to investigate the effect of age, sex, academic degree, level, work experience, and faculty, considering that there is no reason to participate in more than one age group and gender or from one or more specific faculties, there is no need to take a sampling stratified by faculties. However, if the minimum required sample was not available from a faculty (especially smaller faculties), sampling continued from those faculties until reaching the minimum required sample. Anyway, these items were also asked from the participants at the end of the questionnaire to avoid prestige bias.

Considering the clinical and basic science faculties' familiarity with the principles of digital professionalism (60 and 82 percent, respectively) (12), based on a previous study (12) and also a pilot study, taking into account the first (α) and second (β) types of error (equal to 5% and 20%, respectively), using the formula of comparison of two ratios, and using Stata software, the sample size was estimated to be 75 people in each group.

The standardized Persian questionnaire used in this study has 5 fields and 33 questions. The questionnaire was self-administered by the participants. The reliability coefficient of the questionnaire is 0.78 and has face and content validity (in most cases above 0.7). The test-retest reliability coefficient was 0.81, and the internal consistency was 0.69. (5) Five main factors of the questionnaire were compliance with the laws and regulations governing cyberspace, individual professionalism in using cyberspace, knowledge management and information literacy, respect for professionalism in interpersonal and group rules, and compliance with ethics in the use of cyberspace.

Frequency, percentage, mean, standard deviation (SD), 95% confidence interval (CI), Spearman and Pearson correlation coefficients, and statistical tests consist of chi-square, t-test, Mann-Whitney U, one way ANOVA with Tukey Post Hoc test, and Kruskal-Wallis H were used by SPSS software (Chicago, IL, USA) to analyze the data. A p-value level of less than 0.05 was considered significant. For each of the 33 questions, five factors and for the whole questionnaire, the mean score and 95% confidence interval or standard deviation were calculated. The maximum score of questions, factors and questionnaire was considered as ten.

Results

The mean (\pm SD) age of the 149 participants in this study was 46.8 ± 8.5 years, and 77 persons (51.7%) were women. Most of them (75.2%) were in medical school, in the clinical stage (65.1%), and assistant professors

(51.7%) with work experience from 6 months to 35 years (Table 1).

The overall mean score of the questionnaire of all participants was equal to 8.0 ± 1.1 . Scores of the five domains (factors) are summarized in Table 2.

The mean score in the questions of each of the 5 factors is given in Table 3. The highest and the lowest scores were on the questions about "non-publication of images and immoral content inappropriate to the culture and norms of society" with a score of 9.8 ± 0.5 and "not logging into resources through blockers and locksmiths if their use is restricted" with a score of 4.8 ± 1.3 out of 10. The highest and lowest SD among the five factors were in the domains of "Respect for professionalism in interpersonal and group rules" and "complying with ethics in the use of cyberspace", respectively, which shows that there is the most and the least difference in the sub-area among the participants in these two areas.

Women had a significantly better status than men in the principles of digital professionalism as a whole ($P = 0.001$) and all areas except for "compliance with the laws and regulations governing cyberspace", in which no statistically significant difference was observed (Table 4).

There was no difference in age ($P = 0.107$) and work experience as an academic staff ($P = 0.148$) between men

Table 1. Basic characteristics of the faculty members of Iran University of Medical Sciences participating in the study for determining awareness of the principles of digital professionalism

Variable	Value
Age, mean \pm SD, year	46.8 \pm 8.5
Work experience, mean \pm SD, year	11.5 \pm 9.4
Female sex, No. (%)	77 (51.7)
Level	Clinical 97 (65.1)
	Basic sciences 52 (34.9)
Academic degree	Professor 20 (13.4)
	Associate professor 46 (30.9)
	Assistant professor 77 (51.7)
	Instructor 6 (4.0)

SD: standard deviation

Table 2. The average score in each field of the five domains of the questionnaire of digital professionalism of the academic staff of Iran University of Medical Sciences

Factor	Score*
Compliance with the laws and regulations governing cyberspace	7.4 (7.1, 7.7)
Individual professionalism in using cyberspace	8.8 (8.6, 9.0)
Knowledge management and information literacy	7.6 (7.3, 7.8)
Respect for professionalism in interpersonal and group rules	7.0 (6.7, 7.3)
Complying with ethics in the use of cyberspace	9.2 (9.1, 9.3)

*: mean (95% confidence interval)

Table 3. The average score in each question and five domains of the questionnaire on the principles of digital professionalism in the academic staff of Iran University of Medical Sciences

Question	Score*
Domain 1: Compliance with the laws and regulations governing cyberspace	7.4 \pm 1.6
1 The ability to find up-to-date resources on Internet sites	8.4 \pm 1.7
2 The ability to distinguish valid sources from non-valid	7.8 \pm 2.0
3 Ability to manage resources and mass data to achieve specialized findings	7.2 \pm 2.1
4 Understanding the most up-to-date and functional software tailored to the needs	7.3 \pm 2.0
5 The art of analyzing content in cyberspace and identifying its validity	7.4 \pm 1.8
6 Familiarity with a variety of file formats and ways to convert and modify them	7.5 \pm 2.2
7 Familiarity with specialized sites	7.8 \pm 1.9
8 Managing the use of Internet resources in search and use	8.2 \pm 1.7
9 Using virtual storage spaces to store information	6.5 \pm 2.4
10 Complying with the media regime in the use of cyberspace	5.8 \pm 2.5
Domain 2: Individual professionalism in using cyberspace	8.8 \pm 1.1
11 Respecting the privacy of individuals in entering cyberspace	8.6 \pm 1.8
12 Attention to the values and intellectual and cultural interests of the group in the publication of virtual content	8.7 \pm 1.7
13 Not going too far in sending bulk content to interest groups	9.0 \pm 1.5
14 Non-publishing of immaterial content in cyberspace	9.7 \pm 0.9
15 Having the art of discussion and dialogue in collaborative environments	7.7 \pm 1.7
16 Considering the privacy of individuals in using resources and information	9.2 \pm 1.3
17 Commitment to the goals and rules of grouping on the use of social networks	8.8 \pm 1.7
Domain 3: Knowledge management and information literacy	7.6 \pm 1.4
18 Understanding the rules and regulations for the use of virtual spaces	7.5 \pm 1.9
19 Respecting intellectual property rights (copyright) in accordance with the rules for the use of virtual content	7.7 \pm 2.2
20 Getting permission from the authors of resources and then using them	7.7 \pm 2.1
21 Professional commitment to business in cyberspace	8.7 \pm 1.5
22 Using the names of the content authors in the referrals	9.0 \pm 1.3
23 Not logging into resources through blockers and locksmiths if their use is restricted	4.8 \pm 1.3
Domain 4: Respect for professionalism in interpersonal and group rules	7.0 \pm 1.9
24 Recognizing customers and their Needs	7.0 \pm 2.1
25 Using the right technology in advertising and business	6.3 \pm 2.5
26 Commitment to customers and their needs in advertising and business	7.4 \pm 2.2
27 Respecting all guidelines and regulations regarding the supply of goods and services in the electronic environment	7.3 \pm 2.3
Domain 5: Complying with ethics in the use of cyberspace	9.2 \pm 0.8
28 Not creating pseudo-worthless sites in cyberspace	9.6 \pm 1.2
29 Logical use of time spent on the web	7.8 \pm 1.9
30 Not manipulating information in virtual spaces	9.3 \pm 1.3
31 Honesty in declaring personal identity in virtual spaces	9.2 \pm 1.1
32 Non-publication of images and immoral content inappropriate to the culture and norms of society	9.8 \pm 0.5
33 Non-publication of unsafe content anonymously in cyberspace	9.5 \pm 0.8

*: mean \pm standard deviation

Table 4. Comparison of the average score of women and men in five domains of the questionnaire and the overall score of the principles of digital professionalism of the academic staff of Iran University of Medical Sciences

Domain	Score*		
	Female	Male	P-value
Compliance with the laws and regulations governing cyberspace	7.5±1.7	7.3±1.6	0.588
Individual professionalism in using cyberspace	9.1±0.8	8.5±1.2	0.002
Knowledge management and information literacy	8.1±1.3	7.0±1.3	<0.001
Respect for professionalism in interpersonal and group rules	7.4±1.8	6.5±1.9	0.002
Complying with ethics in the use of cyberspace	9.4±0.8	9.0±0.8	0.021
Total score of the principles of digital professionalism	8.3±1.0	7.7±1.1	0.001

*: mean±standard deviation

Table 5. Comparison of the average score of the faculties of basic and clinical sciences in each field of the five domains of the questionnaire and the overall score of the principles of digital professionalism in the academic staff of Iran University of Medical Sciences

Domain	Score*		
	Basic sciences	Clinical faculties	P-value
Compliance with the laws and regulations governing cyberspace	8.0±1.5	7.1±1.6	0.002
Individual professionalism in using cyberspace	9.0±1.0	8.7±1.1	0.165
Knowledge management and information literacy	7.9±1.4	7.4±1.4	0.050
Respect for professionalism in interpersonal and group rules	7.1±2.3	6.9±1.7	0.554
Complying with ethics in the use of cyberspace	9.3±1.0	9.2±0.7	0.459
Total score of the principles of digital professionalism	8.2±1.2	7.8±1.0	0.049

*: mean±standard deviation

and women.

Academic degree ($P = 0.107$), teaching faculty ($P = 0.463$), age ($P = 0.293$), and work experience as an academic staff ($P = 0.267$) have no relationship with the total score of the digital professionalism.

Working experience as an academic staff had a statistically significant relationship only with the domain of “respect for professionalism in interpersonal and group rules” ($r = 0.170$, $P = 0.038$); but not related to any other domains.

Age and teaching faculty had no statistically significant relationship with any of the domains.

The domain of “knowledge management and information literacy” had a significant range from the highest to the lowest scores in order of instructor, assistant professor, associate professor and professor (9.1±1.1, 7.9±1.3, 7.6±1.4, and 7.3±1.5, $P = 0.039$). Other domains did not differ between people with different academic degrees.

Age and work experience were significantly seen from the highest to the lowest score in professor, instructor, associate professor, and assistant professor degrees ($P < 0.001$ for both).

The teaching faculty was not related to age ($P = 0.447$) and work experience ($P = 0.662$) and the total score of digital professionalism ($P = 0.336$) and its domains.

The level of basic sciences significantly has a more favorable situation than clinical faculties in the principles of digital professionalism as a whole ($P = 0.049$) and in the domains of “compliance with the laws and regulations governing cyberspace” ($P = 0.002$) and “knowledge management and information literacy” ($P = 0.050$) (Table 5).

There was no difference in age ($P = 0.203$), gender ($P = 0.464$), and work experience as an academic staff ($P = 0.145$) between faculty members of basic and clinical sciences.

Discussion

The Mean age, gender distribution, faculty, degree, and academic degree of the participants in this study were very

close to the distribution of these variables in the whole university. Therefore, the results of the present study seem to be generalizable to all members of the academic staff of the University of Iran.

Although the mean total score of the questionnaire is relatively acceptable at 80%, it cannot show the fluctuations of personal scores in the items of each field. For example, there were questions with mean scores lower than 6 and higher than 9.5.

In addition, since the scores are self-reported by individuals, it can be interpreted that this is the maximum score assumed for each individual and in all areas, and therefore, the actual score of individuals will probably be lower than this.

Interventions to improve the familiarity and performance of the academic staff members based on the items that need to be strengthened, including the four items with the lowest score (“using virtual storage spaces to store information”, “complying with the media regime in the use of cyberspace”, “not logging into resources through blockers and locksmiths if their use is restricted” and “using the right technology in advertising and business”) should be done. These interventions can include pre-employment training packages, in-service training, requirements or incentives that can be used for their promotion, messages sent in the form of an administrative letter or SMS containing a link consisting of additional information on virtual pages, and workshops for the empowerment of faculties. These trainings should provide the minimum necessary matters for teachers, especially since it has been shown that digital literacy has a direct, positive, and significant effect on people's job performance (13).

Interventions should be more focused on men, professors, and clinical faculty members who had lower scores than others. However, another relatively similar study on Iranian teachers showed no difference between men and women (12).

Considering the lack of significant difference in age and

work experience as academic staff between women and men, the difference between genders in the total and domain score of the principles of digital professionalism can be considered as the result of the inherent difference between them and not the confounder effect of age and work experience.

Academic degree, teaching faculty, age, and work experience were not related to the general state of digital professionalism. Therefore, no difference between these sub-groups is needed for initial assessment or subsequent training. Moreover, these results show that the increase in work experience, academic degree and age (all of which are somehow caused by age) are not important factors in the level of competence and knowledge of academic staff members in the field of digital professionalism. Therefore, in future studies, we should either look for other factors affecting the principles of digital professionalism or, based on the results of this study, spend more time and training for male clinical professors.

The direct relationship between work experience and the domain of “respect for professionalism in interpersonal and group rules” by looking at the sub-indices of this factor shows that increasing work experience can have a positive effect on the proper recognition of customers and their needs, the use of appropriate technology in advertising and business, have a commitment to customers and their needs and comply with all instructions and regulations regarding the supply of goods and services in the electronic environment. However, the lack of association between work experience and other areas indicates that work experience does not affect the sub-indices of the principles of digital professionalism. Therefore, up-to-date and frequent training is needed and not limited to old and one-time training because work experience does not affect these principles.

The domain of “knowledge management and information literacy” was significantly seen from the highest to the lowest score in individuals with the rank of instructor, assistant professor, associate professor, and professor. This partly shows the up-to-dateness of younger compared to older faculty members with higher academic degrees. Therefore, it is necessary to explain (teach) these rules, especially to professors, more than others (associate professors, assistant professors, and trainers).

The basic science section had a significantly better status than the clinical professors in terms of the principles of digital professionalism as a whole and the domain of “compliance with the laws and regulations governing cyberspace” and “knowledge management and information literacy”. On the other hand, there was no difference in age, gender, and work experience as academic staff between professors of basic and clinical sciences. Therefore, this difference seems to be a real and inherent difference between the members of the scientific faculty members of basic and clinical sciences. So, it is necessary to provide more training for the members of the clinical scientific faculty compared to the scientific faculty of basic sciences.

It has been advised the personal lives of people be separated from their professional lives (3). A new set of rules

of digital professionalism is needed with an inevitable increasing transition toward a digital environment (10). Albeit, the evolution of digital technology is outpacing the sporadic updating of codes of professional conduct in this area (11).

A qualitative study showed Adherence to digital standards, responsibility, empathy, sensitivity, and commitment to society are the basic elements of the e-professionalism framework of medical education (14).

Limitation

A low response rate (15%) can be a shortcoming of the present study. It can be due to the hard-to-reach population under study. However, the lack of age and gender difference between the participants and the non-participants and the lack of age, gender, and work experience as academic staff between faculties of basic and clinical sciences can, to a large extent, decrease the possibility of selection bias (more participation of certain people with characteristics that affect on the study results) in this study.

Repetition of the present study in the following years to monitor the changes in the items, areas and the overall score of the principles of digital professionalism in this population can evaluate the effectiveness of the mentioned interventions. Also, in future studies, it is appropriate to investigate the adequate use of time, how to use all types of social media and virtual space, the principles of exploitation, and professional behavior in the digital world among academic staff members.

Conclusion

The total mean score of the medical faculties about digital professionalism is relatively acceptable at 80%, despite high variance in different fields and in personal scores in the items of each field.

Coherent, timely, and up-to-date training to ensure the effective, safe, and appropriate use of digital technology, especially for men, professors, and clinical faculty members who had a lower score than others, should be done.

Contributorship

Idead: AK, KSA; Design, proposal: AK, DR, KSA; Data collection and analysis: AK; First drafting: AK; critical revision: KSA, DR; Guarantee all details of the study: AK, KSA, DR

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Ethical Approval

The advisory board of the ethics committee of Iran University of Medical Sciences approved this study by this code number: IR-IUMS-FMD-REC-1402-014.

Conflict of Interests

The authors declare that they have no competing interests.

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