Original Research

Educational needs assessment of faculty members in research at the Tabriz University of Medical Sciences

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Abstract

Background: Research and research skills of faculty members are essential for the development of higher education and sustainable development. Therefore, this study was conducted to develop needs assessment of faculty members in research at the Tabriz University of Medical Sciences.

Methods: This cross-sectional study was conducted in 2018. Of 848 faculty members at the Tabriz University of Medical Sciences, 262 members participated in the study, determined based on Morgan's table. A researcher-created questionnaire with 5-point Likert-type closed-ended questions was used for collecting data. Validity and reliability were determined with content and construct validity and Cronbach's alpha, respectively. Data were analyzed with Pearson's chi-square and one-way ANOVA using SPSS 22.

Results: Factor analysis showed that the educational needs of the faculty members in research at the Tabriz University of Medical Sciences can be classified into eight topics that were not different in terms of the academic rank, but there was a significant difference in terms of gender and faculties. Faculty members in the pharmacy, dentistry and nursing faculties reported higher educational needs than the faculty in medicine and other faculties.

Conclusion: The results showed that women reported higher educational needs, differing across faculties. It is suggested that research management training courses be prioritized, and key reasons or factors influencing the research in the faculties of dentistry, pharmacy and nursing be investigated.

Introduction

Human resource training in organizations paves the way for individual and group growth and development of talents and capabilities of employees and leads to qualitative and quantitative performance improvement.[1] Therefore, human resources at any level of the organization's categories, whether simple or high-level complex jobs, requires training, learning and acquiring new knowledge and skills. Need is defined as the distance between existing and desired results, or the difference between what is and what should be.[2] Educational needs are those needs that can be met through education. Such needs are generally addressed as knowledge, skills and attitudes. Needs assessment in organizations determines the optimal level of skills and knowledge and includes an assessment of the current and expected skills and knowledge of employees, and an analysis of the gaps between these two categories

of information, or a training needs assessment.[1,3] Most experts have defined training needs assessment as the gap between the desired and the current situation in the field of performance and other job requirements of employees.[4,5] Needs assessment is the first step in an education and development program and is used as a basis for setting education goals, implementing programs, and evaluating the education provided. According to UNESCO, types of education include formal education, usually conducted in educational institutions, and informal education, a type of education outside the formal education system that is continuous and discontinuous in terms of time, and continuing education, a term used to describe all forms of education that includes those who have dropped out of formal education at any level and entered the job market and have accepted the responsibilities of adults. Since one of the main missions of a higher education

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system and universities is to produce science and develop theoretical and applied knowledge along with training specialized human resources, research and research skills of faculty members are essential for the development and sustainment of higher education.[6,7]

Accordingly, in order to develop research skills among faculty members, an educational needs assessment in research is key and can lead to practical suggestions to improve research capabilities among faculty members along with research development at the Tabriz University of Medical Sciences.[8,9] This study's aim was to identify and prioritize the educational needs of faculty members at the Tabriz University of Medical Sciences in research to use in planning in-service training courses to improve research skills of faculty members and enhance research development at the Tabriz University of Medical Sciences. Previous educational needs assessments were not conducted specifically in the field of research. In addition, various university faculties were not compared. Thus, the results of this study can help identify and prioritize the educational needs of faculty members in the area of research based on their faculty and their gender.

Materials and Methods

This cross-sectional study was conducted in 2018. Of 848 faculty members at the Tabriz University of Medical Sciences, 262 members participated in the study, a number determined based on Morgan's table. A questionnaire was designed based on three areas of knowledge, skills and attitudes in research.[10,11] The questionnaire consisted of 43 items measured on a 5-point Likert-type scale, where very low was equal to 1 and very high was equal to 5. The total number of points possible was 215. There were three subscales: items 1 to 17 were the knowledge area, for a total of 85 possible points, 18 to 32 were the skill area, for a total of 75 possible points, and 33 to 43 were the attitude area, for a total of 55 possible points. A pre-test was done among 30 faculty members at the Tabriz University of Medical Sciences to ascertain the validity and reliability of the questionnaire based on Cronbach's alpha.[12,13] The alpha was above 0.7 for all variables, indicating acceptable reliability. Of the respondents to the questionnaire, 71% were males and 29% were females.

Exploratory factor analysis was used to design the model for each of the identified indicators for knowledge, skill and attitude. Exploratory factor analysis helps determine the indicators and items of each variable. In order to separate and categorize the 43 items related to the educational needs assessment of the faculty members at the Tabriz University of Medical Sciences from these three dimensions and to determine its indicators, exploratory factor analysis technique was used based and determined to have a KMO (Kaiser-Meyer-Olkin measure of sampling) value of 0.76. Since this value is greater than 0.6, it indicates that the sample is acceptable and nearing adequate (based on two-to-two correlation of the reagents and their partial correlation).[14,15] Bartlett's test of sphericity is equal to 3984.23 with a significance level of $P<0.001$. This indicates that the separation of factors was done correctly and the items in each factor have a high degree of congeneric correlation. Variations and factors for the educational needs assessment of faculty members were calculated and up to 58% of the total variance of factoring and reduction of 43 items to thirteen main factors was achieved, indicating a desirable criterion, since at least 50% of the variance needs to be explained in factor analysis. In addition, the coefficients were calculated using Varimax rotation and the educational needs assessment of faculty members at the Tabriz University of Medical Sciences in the research field were classified as follows.[16,17,18]

1. Awareness of research programs and their implementation in the organization related to items 1-2-3-4-5-6-7-7-10-22-23-41
2. Mastering research activities and creating a research group in the organization related to items, 27-28-29-32-33-34-35-40
3. Accuracy and speed in conducting research related to items 19-21
4. Expertise in conducting research in the organization related to items 14-15-16-25-26
5. Preparation and planning in research related to items 8-9
6. Identifying existing problems and difficulties for selecting research in the organization related to items 17-18-20
7. The spirit of cooperation in conducting research in the organization related to items 36-37-38-39
8. Familiarity and interest in research processes related to items 11-12-13-30-31-42-43

Data were collected using self-administered questionnaire and analyzed using SPSS 22. Chi square, independent samples t test and one-way ANOVA were used for analysis, and P values of ≤0.05 or lower were considered significant.

Results

Regarding faculty academic rank, it was determined that 83.2% (218) were assistant professors and 12.6% (33) were associate professors, with 3.4% (9) being full professors and 0.8% (2) being instructors (Table 1).

Table 2 shows that the knowledge needs with an average of 59.05%, skill needs with an average of 60.13 and attitude needs with an average of 42.46 are higher than the theoretical average. In general, the educational needs of faculty members are higher than average.

Regarding Friedman's test, the role of skill needs has the highest rank with 2.54, the effect of knowledge needs has the second rank with 2.38, and the effect of attitude needs has the lowest rank with 1.08. The value of χ^2 was 345.25.

At a significance level of $P<0.001$, this prioritization is considered valid. In fact, among the well-known indicators in the educational needs of faculty members in research,

Table 1. Distribution of academic rank

Academic rank	No. (%)
Instructor	2 (0.8)
Assistant professor	218 (83.2)
Associate professor	33 (12.6)
Full professor	9 (3.4)
Total	262 (100)

Table 2. Descriptive statistics of study variables

Variables	Min	Max	Mean	SD
Knowledge (total possible: 85)	39	85	59.05	11.16
Skill (total possible: 75)	45	74	60.13	5.90
Attitude (total possible: 55)	24	52	42.46	4.81
Total (total possible: 215)	108	211	162.72	5.27

the effect of skill needs has the highest value and the effect of attitude needs has the lowest value. Based on the results of an independent samples t test ($P = 0.031$), the mean educational needs of male faculty members was 160.16 and the mean among females was 165.19. As a result, the educational needs of female faculty members at the Tabriz University of Medical Sciences are higher than men. The educational needs assessment of faculty members in the research field which has been done separately in terms of the academic rank showed that $P = 0.91$) Therefore, there is no evidence to show the educational needs of the faculty members in terms of the academic rank. Since there were only two instructors in the academic rank, no t test was conducted. Due to the very high number of faculty members at the medical school (143 members) compared to fewer than 10 faculty members in other faculties, to increase the validity of comparison among the faculties categories, the medical faculty was placed on one category and the faculties of dentistry, pharmacy and nursing were merged for another category and other faculties (rehabilitation, nutrition, health, paramedical, modern sciences and management) were merged for a third category and compared.

Due to the number of participants, one-way ANOVA was used without the need to test the normality of data distribution; the results are shown in Table 3.

Regarding the results analysis of one-way ANOVA test and F calculated at a significance level of <0.001, it can be seen that educational needs varied significantly by the faculty. This difference was examined in an LSD follow-up test and the results are shown in Table 4.

The results of post hoc testing (Table 4) showed a significant difference between the medical school faculty and the dentistry, pharmacy and nursing faculties, where the educational needs of the faculty members at the dentistry, pharmacy and nursing faculty were higher than the medical school. There was also a significant difference between the dentistry, pharmacy and nursing faculties and

the other faculties, and the educational needs of faculty members in the dentistry, pharmacy and nursing faculties were higher than those in other faculties.

Discussion

Regarding the educational needs of the faculty members at the Tabriz University of Medical Sciences, the results showed that the separation of factors was correctly carried out, and the variables in each factor had a high root correlation with one another. Based on the results of a factor analysis, the educational needs of faculty members could be categorized into three factors: knowledge, skills, and attitudes. Wahba Hassan [20] found that educational programs were appropriate to the educational needs of the faculty members and their scientific literacy level. In order to develop and improve an organization, its members must systematically and continuously keep up with new job technology and take steps to improve, grow and develop. Based on Khorasani[3] resources for determining needs should be the employees within the organization for educational needs assessment. Beltaine[21] concurred that in order to identify new educational topics, needs assessment questions should be asked of employees themselves. The educational needs seen in this current study can be due to the improvement in science and technology and perhaps a lack of in-service training in this field. In addition, considering that the needs assessment of the university is not in accordance with the scientific principles and research literature and faculty members themselves are not consulted, and previous training courses may not be appropriate to the duties of faculty members, these needs may have been a result of ineffectiveness of previous in-service training.

In terms of prioritizing educational needs of the faculty members at the Tabriz University of Medical Sciences, thirteen factors whose P values were greater than 1 were extracted. According to the factor matrix table, after Varimax rotation, the most important needs for the first factor were guidance of subordinates and members of the research team (item 23), familiarity with rules, guidelines,

Table 3. Descriptive statistics of educational needs variable based on type of faculty

Faculty	n	Mean	SD
Medical	143	159.8	16.99
Dentistry, pharmacy and nursing	71	168.8	17.21
Others	48	156.4	14.80

Table 4. Comparison of mean difference of educational needs among faculties

Faculty	Mean difference	P value
Medical with dentistry, pharmacy and nursing	-8.95	<0.001
Medical with other faculties	3.4	0.22
Dentistry, pharmacy, and nursing with other faculties	-12.35	<0.001

regulations and administrative hierarchy related to research projects (item 4), and exchange of scientific information available in the research network (item 5). For the second factor, creating a spirit of criticism from colleagues in research issues (item 34), preparation of scientific-review articles (item 28), attracting specialized cooperation in the university for conducting research affairs (item 33), and being accountable to research colleagues for research commitments (item 40) were of great importance. For the third factor, the ability to identify research deficiencies during and after work (item 19) was extremely important, and for the fourth factor, familiarity with SPSS and LISREL statistical software (items 15 and 16) were important.

For the fifth factor, the principles and methods of planning in research management and knowledge updating in the field of specialized sciences (items 8 and 9) were important. For the sixth factor, familiarity with other statistical and research software (item 17) and the ability to determine easily and timely work priorities in the field of research (item 20) were prioritized. For the seventh factor, mastery of fishing methods, use of resources, relevant documents and information and research background (item 39); for the eighth &ninth factor, interest in participating in in-service training to improve one's academic level in the field of theoretical knowledge of research (item 42); for the tenth factor, familiarity with work processes in the field of research services (item 12); for the eleventh factor, methods of informing colleagues and clients (item 11); for the twelfth factor, report writing in research fields (item 30); and for the thirteenth factor, familiarity with the techniques of forming research teams and their optimal management (item 10) were higher priorities. In terms of educational needs by gender, according to *t* test, it was observed that female faculty had higher educational needs. These results are inconsistent with Bashi,[16] Nazari Matek,[22] and Mohammadi Chemardani's findings.[23] Also based on at-test, there was no evidence of a difference in the educational needs of faculty members by academic rank. These results are consistent with Ghanbari[24] and Davoodi's work,[25] but inconsistent with AminAlRoaya et al[26] and Firoozbakht 's studies.[27] It seems that the lack of difference in educational needs in academic rank may be related to the lack of major differences among faculty members in terms of field and work interests; there is no specific need in terms of research skills, but rather in the field of research management. The results of the follow-up test indicated a significant difference among the medical faculty and the dentistry, pharmacy and nursing and the educational needs of faculty members in pharmacy, dentistry and nursing were higher than those in medical school. There was also a significant difference between the pharmacy, dentistry and nursing faculties with other faculties, and the educational needs of faculty members in the pharmacy, dentistry and nursing faculties were higher than those of other faculties.

In examining this finding, it can be posited that a higher educational need among the faculty members of the pharmacy, dentistry and nursing faculties may be a result of faster changes in the relevant sciences. Finally, changes in software and thematic areas of research in these faculties as well as employment of the faculty members of these faculties in public and sometimes private medical centers may contribute to less involvement in research.

Conclusion
Based on the results of this study, the educational needs of faculty members at the Tabriz University of Medical Sciences in the field of research can be classified into eight areas. Comparing averages also showed that the educational needs of faculty members by gender and faculties at the Tabriz University of Medical Sciences during this research are different. Women have higher educational needs, and the educational needs of the pharmacy, dentistry and nursing faculties are higher than those of medical school and other faculties. However, educational needs do not differ significantly by academic rank. Restricted research within the university and lack of similar research were among the limitations of the current study. It is suggested that research management training courses be apriority focus. Key reasons or factors influencing the research history among the dentistry, pharmacy and nursing faculties may be an area for future investigation.

Competing interests
We had no conflicts of interests in this study.

Authors' contributions
Data collection and analysis was done by HA. The manuscript was written by TH and also manuscript edition and final confirmation of this article was done by TH and AH is superviser of research.

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