

Perceived barriers to the production of scientific articles among faculty members of some of Iranian dental schools

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Objectives To evaluate barriers for production of scientific dental articles by Iranian dental faculty members.

Methods An anonymous self-administered questionnaire distributed among faculty members of all dental schools in Iran during June-December 2010. The respondents rated their level of agreement with eleven sentences regarding what they perceive as barriers on scientific dental article production based on a 5-point Likert scale. The data were analyzed using Chi-square test.

Results Totally, 330 faculty members completed the questionnaires; >50% were men, and >40 year-olds. About three-fourth of the respondents were assistant professor. More than 80% of the respondents reported to have at least one published Persian article and >50% at least one published English article; older faculty members more than younger, and associate professors more than other academic ranks ($p<0.01$). “No access to an English editing center”, “insufficient skill for scientific writing in English”, “inappropriate condition for writing in dental school”, and “time limit due to high load of clinical work in dental school” were top four rated perceived barriers.

Conclusion The concerns of faculty members for the production of scientific dental documents must be considered. Provision of proper time and condition for writing in the dental school, enhancement of their capacity for scientific writing and establishment of an English editing center in each university may facilitate scientific article production.

Keywords Journal Articles, Faculty, Dental, Unpublished Works

Introduction

Scientific article production is considered as a standard measure for academic activities of higher education institutions. Moreover, quantity and quality of scientific papers constitute a measure for assessing the level of development of countries.¹ Developed countries, due to good resource management toward scientific research, have a higher contribution in research productivity and consequently in scientific publications. In this regard Allareddy et al.² reported that more than 50% of the world dental publications in the year 2013 are from United States of America, Brazil, India, Japan and United Kingdom. A rapid rise in the production of scientific articles of Iran has been noted specifically in the field of biomedicine in recent decade.^{3,4} A similar trend is evident in the field of dental science too.⁵ The rate of scientific dental articles is very limited compare to the total biomedical articles. Djalalinia et al. found that of about 82000 published articles in health sciences during 2000-2014 from Iran, dentistry together with some other fields constituted about 16% of the whole articles.⁶

One of the basic principles of medical researches is to publish the findings⁷ in order to make it accessible to the users of the research for ultimate improvement of population health. Leaving researches unpublished is a waste of resources and can be regarded unethical. It is estimated, however, that about half of the performed studies

in the field of medicine and health remain unpublished.⁸

In a systematic review, Song et al.⁸ reported the following reasons given by investigators for not publishing: lack of time or low priority, perceiving results to be unimportant or negative, not-complete study, study not for publication, journal may reject the study, the quality of the study is poor, manuscript in the preparation stage, problems with authorship, problems with sponsorship. Faculty members are the main actors in the production chain of scientific papers in each university and their concerns in this regard is of utmost importance. Health and medical faculty members have indicated scarce research budget, complex bureaucratic administration, low motivation among researchers, and time constraint as main obstacles for research production.⁹⁻¹² Similar studies on the viewpoints of dental faculty members in the literature are, however, rare. Understanding what impede dental faculty members from publishing their research is the first step for the provision of a desirable environment that encourage scientific writing and publishing. The aim of this study was, therefore, to evaluate what the faculty members of dental schools in Iran perceive as barriers for the production of scientific dental papers out of performed and completed studies. With a considerable number of faculty members and students in under- and postgraduate level in approximately sixty schools of dentistry in Iran, it is expected to have a higher share of scientific dental articles from Iran in the literature of biomedicine.

Materials and Methods

The present cross-sectional study performed from June to December 2010. The data collected from faculty members of all 18 dental schools (at the time of this study) in Iran by means of an anonymous self-administered questionnaire.

The questionnaire contained the followings:

1. Individual and job related characteristics: gender, birth year, university from which they had graduated (undergraduate and post-graduate) and year of graduation, academic rank and academic group which the respondent belongs to.
2. Barriers to the production of scientific articles: eleven statements inquired faculty members' view on obstacles that affect their scientific article production. These include high load of clinical work, lack of financial motivation, low impact on job promotion, lack of writing skills in English, lack of competency in scientific writing, no access to a professional center for language editing, lack of proper physical condition to write the article in Faculty, and low quality of certain students' research works.
3. Number of scientific documents: Respondents were asked about the number of their published scientific dental papers in Persian and English domestic journals and foreign scientific journals, including English and non-English, number of their supervised under- and post-graduate theses, and research projects they have performed other than the theses during last ten years (1999-2009).
4. Before the initiation of main study, ten faculty members in the department of community oral health at Shahid Beheshti School of dentistry were asked to answer to the questionnaire for validity evaluation. A revision was performed based on the collected opinions to improve the face validity. After a two week period, the same faculty members answered the questionnaire in order to assess its reliability. This test-retest process resulted in an acceptable level of agreement for most of the questions (weighted kappa coefficient was between 0.45-0.75 for different items in the questionnaire).

For the main phase of the study and to increase the probability of answering, prepared questionnaires were sent to each of 18 dental schools with an official letter from the secretariat of "the council for dental education and post graduate of the Ministry of Health". Completed questionnaires were recalled and collected for data analysis using SPSS software (Version 20, IBM, USA). In order to facilitate data analysis, dental schools were categorized into two groups; schools of Tehran, Shahid Beheshti, Mashhad, Isfahan, and Shiraz, with more than 30 years of educating experience as the old and the rest of the schools as new ones.

Descriptive statistics included frequency and percent of the faculty members belong to each category. Chi-square test served as statistical evaluation to assess differences in frequencies. To evaluate the factors related to the faculty members' reported at least one article in Persian, national English, or Foreign English journals, three similar logistic regression models were fitted to the data while gender, age, academic rank, and group of dental school (old or new) served as covariates. The corresponding odds ratios (OR) and their 95% confidence intervals (95% CI) were calculated. The goodness of fit of the models was assessed by the Hosmer-Lemeshow test.

Results

In total, 330 faculty members returned the completed questionnaires. Table 1 shows the characteristics of the respondents with more than half of the respondents being male, >40 year-olds, and from new dental schools. About three-fourth of the respondents were assistant professor.

Table 1- Distribution of the faculty members of Iranian dental schools (n=330)¹ based on their background factors

| | | N | % |
|--------------------|---------------------|-----|----|
| Gender | Men | 170 | 52 |
| | Women | 156 | 48 |
| Age groups (years) | ≤40 | 122 | 49 |
| | >40 | 129 | 51 |
| Academic rank | Instructor | 21 | 7 |
| | Assistant professor | 237 | 73 |
| | Associate professor | 51 | 16 |
| Dental school | Full professor | 14 | 4 |
| | New | 143 | 54 |
| | Old ² | 120 | 46 |

1. From 7 to 79 missing data due to no answer for various factors.

2. Dental schools with >30 years of age.

Table 2 shows the faculty members' published articles according to some background factors. More than 80% of the respondents reported to have at least one published Persian article; associate professors more than faculty members with other academic ranks ($p<0.001$), and respondents from old faculties more than those from new faculties ($p=0.02$). Having at least one English article in national English journals has been reported by more than half of the respondents. This figure was close to 60% regarding at least one article in foreign English journals. The latter two items were more prevalent among older than younger faculty members ($p<0.01$), associate and full professors ($p<0.001$), and those respondents from old faculties (≤ 0.05). The faculty members' activities in supervising studies indicated that more than 70% of the respondents reported supervision at least one undergraduate thesis; senior staff more than junior staff and those at associate professor rank more than others (<0.001). Supervising at least one postgraduate thesis has

been reported by 30% of the faculty members; more prevalent among senior faculty members, full professors, and those respondents from old dental schools (<0.001).

More than 60% of the participants had supervised at least one research study other than supervised theses; associate professors more than others ($p < 0.001$). (Table 3)

Table 2- Distribution of the faculty members of Iranian dental schools based on their published articles and background factors

| | | At least one Persian n (%) | At least one national English n (%) | At least one foreign English n (%) |
|--------------------------|----------------------|----------------------------|-------------------------------------|------------------------------------|
| Gender | All | 254 (82) | 166 (54) | 173 (57) |
| | Men | 124 (78) | 81 (52) | 94 (59) |
| | Women | 128 (86) | 83 (57) | 78 (55) |
| | p-value ¹ | 0.08 | 0.42 | 0.56 |
| Age group (years) | ≤40 | 94 (79) | 59 (50) | 55 (47) |
| | >40 | 105 (88) | 78 (67) | 78 (66) |
| | p-value ¹ | 0.07 | 0.01 | 0.005 |
| | Instructor | 10 (53) | 0 (0) | 5 (26) |
| Academic rank | Assistant professor | 179 (79) | 109 (49) | 108 (49) |
| | Associate professor | 48 (100) | 42 (89) | 47 (98) |
| | Full professor | 12 (92) | 11 (92) | 11 (85) |
| | p-value | <0.001 | <0.001 | <0.001 |
| Dental School | New | 104 (78) | 69 (53) | 61 (47) |
| | Old ² | 102 (90) | 74 (66) | 77 (69) |
| | p-value ¹ | 0.02 | 0.05 | 0.001 |

1. Statistical evaluation by Chi-square test.

2. Dental schools with >30 years of age.

Table 3- Distribution of the faculty members of Iranian dental schools based on their number of supervised studies and background factors.

| | | At least one undergraduate thesis n (%) | At least one postgraduate thesis n (%) | At least one research study ¹ n (%) |
|--------------------------|----------------------|---|--|--|
| Gender | All | 225 (73) | 83 (28) | 187 (61) |
| | Men | 119 (75) | 43 (28) | 103 (65) |
| | Women | 104 (71) | 38 (27) | 83 (57) |
| | p-value ¹ | 0.44 | 0.89 | 0.15 |
| Age group (years) | ≤40 | 64 (55) | 16 (14) | 67 (58) |
| | >40 | 117 (96) | 60 (51) | 79 (66) |
| | p-value ¹ | <0.001 | <0.001 | 0.22 |
| | Instructor | 16 (76) | 0 (0) | 6 (29) |
| Academic rank | Assistant professor | 146 (66) | 37 (17) | 131 (59) |
| | Associate professor | 47 (100) | 33 (72) | 40 (85) |
| | Full professor | 12 (92) | 10 (83) | 7 (54) |
| | p-value | <0.001 | <0.001 | <0.001 |
| Dental School | New | 98 (74) | 19 (15) | 81 (61) |
| | Old ² | 91 (81) | 62 (56) | 71 (64) |
| | p-value ¹ | 0.22 | <0.001 | 0.69 |

1. Other than supervised under- and post-graduate theses.

2. Statistical evaluation by Chi-square test.

3. Dental schools with >30 years of age

Table 4 shows the results of three logistic regression models explaining factors related to the faculty members' output in terms of having at least one article in Persian,

national English, or Foreign English journals. The likelihood of having at least one Persian article was higher for female (OR=2.5, 95%CI=0.1-0.9) and those

with higher academic rank (OR=5.1, 95%CI=2.0-13.0). Having at least one English article in national journals was more likely among those with higher academic rank (OR=9.0, 95%CI=3.7-21.0). Faculty members with higher academic rank (OR=4.2, 95%CI=2.1-8.4) and those from old dental schools (OR=1.9, 95%CI=1.0-3.5) were more likely to have at least one article in national English journals.

Figure 1 presents percentages of the studied faculty members who reported their opinions on different barriers in producing scientific documents. The top four rated perceived barriers were “no access to a professional English editing center”, “insufficient skill for scientific writing in English”, “inappropriate condition for writing in dental school”, and “time limit due to high load of clinical work in dental school”.

Table 4- Determinants for having at least one of different research articles among the faculty members of Iranian dental schools (n=330), as assessed by means of three similar logistic regression models

| | E.S. | s.e. | OR | 95% CI | p-value |
|--|-------|------|------------|-----------------|------------------|
| Persian article (0=no, 1=yes) | | | | | |
| Gender (0=female, 1=male) | -0.87 | 0.39 | 0.4 | 0.2-0.9 | 0.02 |
| Age (years) | 0.04 | 0.02 | 1.0 | 0.9-1.1 | 0.09 |
| Academic rank ¹ | 1.64 | 0.47 | 5.1 | 2.0-13 | 0.001 |
| Dental school (0=new, 1=old ²) | 0.21 | 0.40 | 1.2 | 0.5-2.7 | 0.59 |
| Constant and goodness of fit ³ (P) | -3.10 | 1.52 | | | P=0.37 |
| National English article (0=no, 1=yes) | | | | | |
| Gender (0=female, 1=male) | -0.26 | 0.29 | 0.7 | 0.4-1.3 | 0.38 |
| Age (years) | 0.00 | 0.20 | 1.0 | 0.9-1.0 | 0.87 |
| Academic rank | 2.19 | 0.44 | 9.0 | 3.7-21.4 | <0.001 |
| Dental school (0=new, 1=old) | -0.01 | 0.31 | 0.9 | 0.5-1.8 | 0.96 |
| Constant and goodness of fit (P) | -4.33 | 1.08 | | | P=0.38 |
| International English article (0=no, 1=yes) | | | | | |
| Gender (0=female, 1=male) | 0.39 | 0.29 | 1.4 | 0.8-2.6 | 0.18 |
| Age (years) | 0.01 | 0.02 | 1.0 | 0.1-1.0 | 0.60 |
| Academic rank | 1.45 | 0.34 | 4.2 | 2.1-8.4 | <0.001 |
| Dental school (0=new, 1=old) | 0.65 | 0.30 | 1.9 | 1.0-3.5 | 0.03 |
| Constant and goodness of fit (P) | -3.79 | 0.96 | | | P=0.10 |

1- Academic rank: 1- Instructor 2- Assistant Professor 3- Associate Professor 4- Full Professor

2- Hosmer-Lemeshow test

3- Dental schools with >30 years of age

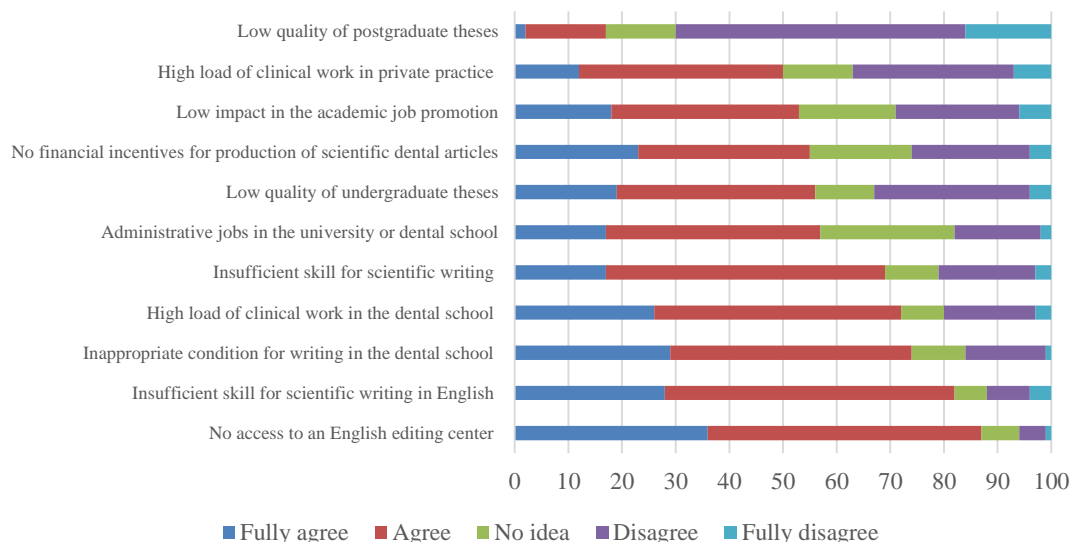


Figure 1- Percentages of the Iranian dental faculty members' (n=330) opinions on different barriers for producing scientific dental articles

Discussion

Most of the faculty members participated in this study reported to have at least one article in Persian language but

producing at least one article in English language was less prevalent. The respondents reported no access to a professional English editing center as the most prevalent barrier for producing scientific publication.

Evidence-based health policy planning and management in each scientific field requires high-quality research which in turn needs competent personnel who are familiar with different stages of research. Faculty members are, therefore, expected to be involved in producing research articles as the output of their research projects. The high percentage of the participants reporting to have at least one Persian article in this study (82%) shows a positive sign for their enthusiasm and involvement in scientific publication. This figure is, however, lower than findings from similar studies on a group of dental faculty members in India¹³ and a group of French researchers¹⁴ in which 99% and 94% reported to have at least one published article, respectively.

Individual and institutional factors influence the research productivity in each research environment.¹⁵ Junior faculty members are expected to be more motivated to produce article while senior faculty members have more experience. In this study, article publishing was more prevalent among senior faculty members compare to those junior faculty members. This is in contrast with the results of two studies from faculty members of a medical university in Lebanon¹⁶ and different universities of Saudi Arabia¹⁰ where junior faculty members were more productive in article production. This may be due to the inquired time span of article production in different studies that were ten years in the present study, six years in the study of Lebanon and two years in the study from Saudi Arabia.

Barriers to the production of published articles may be classified into two phases of before and after performing the research. Most of the educators in the present study seem to perceive barriers after doing the research as up to two-third stated to have supervised at least one undergraduate thesis meaning that enough raw material was available to produce an article. These perceived barriers have been reflected in their responses as illustrated in Figure 1. More than half of the educators agreed that ten out of eleven barriers inquired in the questionnaire impacted on their article production. Top four perceived barriers rated by the respondents were absence of an English editing center, insufficient skill for scientific writing in English, inappropriate condition for writing in the dental school, and high load of clinical work in the dental school. Similar perceived barriers have been reported by the postgraduate students of Iranian dental schools for producing scientific dental articles.¹⁷ A group of French researchers have also reported lack of time and limited skills in English writing as barriers for scientific article production.¹⁴

Although, English language helps communication and collaboration in scientific world, its dominance as an exclusive tool for scientific publications has been criticized^{18, 19} since it may limit local transmission of knowledge when the researchers are encouraged to publish more in English. Moreover, scientific writing in English has been proposed as a barrier for knowledge transfer among non-English researchers.²⁰ Lower percentage of the participants with at least one article in English than Persian language in the current study (57% vs. 82%) reflects some perceived barriers in English writing among these faculty members. On the other hand, participants emphasized their concerns in this regard when more than 80% of them reported “No access to an English editing center” and “insufficient skill for writing in English” as barriers for scientific article production. Good command of English writing has been proposed as a factor determining higher rates of publications among a group of Brazilian researchers.²¹

The picture of dental education in the country has changed extensively in terms of the number of dental schools and faculty members during the recent years. However, findings of the present study are still indicative of the overall national status as newly established dental schools have yet to have time, plan, and resources for research. .

Conclusion

Improvement in the quantity and quality of scientific dental documents in national and international level requires the efforts of dental faculty members. Provision of suitable environment for writing in the dental school, enhancing scientific writing skills of the faculty members and establishment of an English editing center in each university may facilitate scientific article production.

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Conflict of Interests

None Declared ■

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