

Comparison of the papers published in Journal of Shahrekord University of Medical Sciences with those published in other medical journals of Iran in view of methodology

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Abstract: Background and aim: Scientific and research journals are considered as one of the most important tools for scientific and research information and science advancement in any discipline. Publishing articles in these journals is known to be an important indicator for knowledge generation. Comparing and assessing medical journals which present research outcomes, quantitatively and qualitatively, is particularly important to improve and promote them. The present study was conducted to compare the papers published in scientific and research Journal of Shahrekord University of Medical Sciences (JSKUMS) with those published in other medical journals of Iran in view of methodology. Methods: This cross-sectional study examined and compared the observance of scientific writing of “Materials and Method” and “Results” of 113 articles published in JSKUMS with that of 269 articles published in other medical journals of Iran within 2010-2012 through random sampling using a validated questionnaire. The data were analyzed by SPSS software using Chi square, ANOVA, and *t* test. Results: The percentage of original, cross-sectional, clinical trial, and experimental studies published in JSKUMS in 2011-2012 was respectively 93%, 48%, 20%, and 17%. The mean number of authors of the articles was 4.9 ± 3 and the most common errors in JSKUMS and other medical journals of Iran were failure to mention method of sampling (29% and 42% respectively), sample size (7% and 9% respectively), the software used (39% and 10% respectively), methods of randomization and blinding (72% and 27% respectively), letter of consent and ethics committee’s approval (11% and 4% respectively), failure to provide confidence intervals for descriptive indicators (9% and 14% respectively) and required analytical indicators (7% and 16% respectively), and failure to observe the instructions of drawing tables (30% and 17% respectively) and graphs (35% and 25% respectively). The number of case-control studies and cohorts was significantly higher in other medical journals of Iran compared to JSKUMS. Conclusion: Identifying the common errors in the examined journals provided the context for improving and promoting them quantitatively and qualitatively. Therefore, it seems helpful to inform the authors and consider the most common errors, to empower the reviewers and address the quality and quantity of workshops on research methodology and scientific writing, and to provide opportunities for publishing guidelines for research and writing research papers.

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1. Introduction

Research is of particular importance and it could be firmly argued that all scientific, industrial, research, technological, health, medical, and sociological advances are based on research (Moosavi Movahedi et al., 2003). The most important method of presenting the results of a study is through preparing a research paper and a researcher who can publish the results of his/her research in credible research journals will be successful in knowledge generation and dissemination arena (Man et al., 2004). Within the last two decades there has been a rapid progress in all disciplines of science and technology. Thanks to the growth in medical sciences during some past decades and scientists’ increased

tendency to publish their papers in journals, the number of journals has increased to more than 40000 in 2001 from 3000 in 1960, highlighting the importance of assessing the journal and papers quantitatively and qualitatively (Man et al., 2004; Jalalabadi and Taheri, 2004). To publish a scientific paper, author(s) should be familiar with the sections of a paper and observe the preparation sequence. The draft of a scientific paper should include title, author’s or authors’ name and surname, the address of institution(s) in which the study has been conducted, corresponding author, keywords, abstract, introduction, theory, materials and methods, results, discussion, conclusion, acknowledgement, references, and footnotes to figures and tables

accompanied with their numbers. Most journals enjoy the *instructions for authors* section which is available in the initial or final pages of their issues or website (Man et al., 2004; Tabatabaee and Fazelzadeh, 2009; Malek Afzali et al., 2004).

Quantitative assessment of journals' papers which is some part of scientometric and bibliometric activities could be a typical assessment of journals' performance as one of the entities of information dissemination at specified intervals (Valaei et al., 2006; Stone, 2005). Currently papers are generally assessed in three steps; in the first and second steps, they are examined by respectively editor-in-chief and three or four expert reviewers (preferably employed in other institutions). If a paper is accepted in view of scientific content and the level of material, journal, after gathering reviewers' comments, corresponds to the corresponding author in case rectification in writing is required and then the paper will be sent to the editorial board for decision. At this step, the paper, if approved, possibly undergoes some minor changes and is published. These steps which often last for some months may irritate the authors. But the purpose is to promote the quality of presenting research works. Most journals mention some points regarding the preparation of the papers in their first page, or publish some special articles for this purpose (Valaei et al., 2006; Stone, 2005). As it is customary, the papers published in a journal are examined by editorial board of the journal itself or external experts qualitatively and quantitatively, and scientific and research journals publish some articles for highlighting qualitative and quantitative points of view (Valaei et al., 2006; Stone, 2005; Ashraf Ganjooei et al., 2008; Jahani and Rafiei, 2009). From Iran 18 journals are indexed in WOS and 20 journals in SCOPUS. Indexing Iran's journals of medical sciences in these databases is less than 50%, far less than acceptable rates (Abdekhoda et al., 2010). Iran's contribution to knowledge generation in the world increased by 20% (from 62% in 2007 to 82% in 2008) according to the American Institute for Scientific Information (Sabouri, 2008).

Journal of Shahrekord University of Medical Sciences (JSKUMS) has been published since 1991 with the efforts by the scientific staff of the university. Considered as a domestic credible journal, JSKUMS has been ranked as a scientific and research journal since 2001 by Iran's National Committee of Medical Journals. Now that more than a decade has passed since the publication of this journal, with the efforts and cooperation of JSKUMS' editor-in-chief this study was designed to remove the potential deficiencies of the journal, to help its quality and quantity improve, and to inform the submitters and authors of the journal's articles about paying

special attention to writing and correcting the errors commonly seen in articles. For this the "*Materials and Method*" and "*Results*" of the articles published within 2008-2009 in JSKUMS were examined and compared with those in the articles published in other medical journals of Iran in view of observing the principles of paper writing appropriately. In terms of both quality and quantity, comparing and assessing medical journals which are considered as a place for presenting research outputs is particularly important to improve and promote them. The present study aims to assess and compare research papers published in JSKUMS with those published in other medical journals of Iran.

2. Materials and method

This study is epidemiological, descriptive-analytical, and cross-sectional. The community under study is the articles published in JSKUMS and other medical journal of Iran within 2010-2011. The sample size was calculated using the formula of sample size estimation for ratios ($p=0.5$, $d=0.1$, and confidence interval= 95%). The sample size of JSKUMS was 113 (all) articles and the sample size of other medical journals of Iran was 173 articles selected by random clustering. Each journal was considered as a cluster and six journals among 104 clusters were randomly selected.

To specifically compare the articles of JSKUMS with those of a domestic medical journal in 2010, a journal was randomly selected from all journals. In this regard, 96 articles from the Journal of Research in Medical Sciences (JRMS), official journal of Isfahan University of Medical Sciences, were selected and examined. Totally, 382 articles (269 from the journals of Isfahan, Tabriz, Zahedan, Tehran, and Birjand universities of medical sciences and 113 articles from JSKUMS) were examined. For assessing the articles a questionnaire was used. The questionnaire was developed using several educational and research references (Valaei et al., 2006; Stone, 2005; Ashraf Ganjooei et al., 2008; Jahani and Rafiei, 2009; Naylor and Munoz-Viveros, 2005; Guilford, 2001; Moin et al., 2007).

To measure the questionnaire's validity the comments from faculty members and the teachers were elicited and its validity was confirmed. These people were expert in different disciplines of basic, clinical, and epidemiological sciences and social medicine and were known for publishing scientific papers in domestic and foreign credible journals. The questionnaire's reliability was 0.76 according to Cronbach's alpha coefficient. The data were analyzed by SPSS software using descriptive statistics, chi-square, Fisher's exact test, independent t test, and

ANOVA. $P > 0.05$ was considered as the level of significance.

3. Results

The minimum, maximum, mean, and standard deviation of authors' number for JSKUMS' articles was respectively 1, 16, 4.9, and 3. In 2011, the mean number of the articles in other medical journals under study (with an average of 24) was higher than that in JSKUMS (with an average of 14) per season ($p=0.002$). The number of case-control, cohort, and clinical trial studies in JRMS was significantly higher compared to JSKUMS and other medical journals under study ($p=0.001$).

The ratio of the articles whose type were not mentioned in the methodology section was higher in JRMS and other medical journals under study compared to JSKUMS ($p=0.001$). The consistency between authors' address and the place of publication (consistency between the place of employment and publication) in other medical journals was 83% and the least consistency (56%) was observed in

JSKUMS. The ratio of cross-sectional-descriptive, clinical trial, and experimental studies was not significantly different between JSKUMS and other medical journals under study ($p=0.06$). The number of case-control and cohort studies was significantly higher in other medical journals compared to JSKUMS ($p=0.001$).

The relative frequency of the most common errors in the articles in JSKUMS in 2011 was failure to precisely mention randomization and blinding method (75%), to exactly explain how control group was enrolled and its potential differences from intervention group (69%), to mention the target population of the study (45%), the time and place of the study if needed (27%), the statistical software and tests (30%), and confidence intervals for descriptive indices (34%).

The most commonly observed errors in *Materials and Methods* (general methodology), *Materials and Methods* according to the type of study (specific methodology), and the *Results* in JSKUMS and other medical journals in 2011 are shown in Tables 1, 2, and 3 respectively.

Table 1. The distribution of common errors in general methodology of the papers published in JSKUMS, JRMS, and other medical journals under study within 2010-2011

| The most common errors | JSKUMS | | other medical journals under study | | JRMS | | P value |
|--|--------|------|------------------------------------|------|------|----|---------|
| | No. | % | No. | % | No. | % | |
| Failure to mention the type of study in methodology | 4 | 7.4 | 25 | 32 | 25 | 26 | 0.03* |
| Failure to mention sampling method precisely | 16 | 29.6 | 32 | 42 | 30 | 31 | 0.1 |
| Failure to mention how to calculate sample size | 4 | 7.4 | 17 | 22 | 9 | 9 | 0.02* |
| Failure to mention how to measure instrument's validity | 11 | 20 | 8 | 10 | 8 | 8 | 0.09 |
| Failure to mention how to measure instrument's reliability | 8 | 15 | 10 | 13 | 9 | 10 | 0.1 |
| Failure to mention statistical tests properly in data analysis | 15 | 28 | 16 | 21 | 7 | 7 | 0.01* |
| Failure to mention the software used | 21 | 39 | 8 | 10.5 | 8 | 8 | 0.01* |
| Failure to mention obtaining informed consent | 3 | 6 | 2 | 3 | 11 | 11 | 0.01* |
| Failure to mention the approval of ethics committee | 6 | 11 | 3 | 4 | 16 | 17 | 0.01* |

* The difference is significant.

Table 2. The distribution of common errors in specific methodology of the papers published in JSKUMS, JRMS, and other medical journals under study within 2010-2011

| The type of study | The most common errors | JSKUMS | | Other medical journals | | JRMS | | P value |
|----------------------|---|--------|---------|------------------------|---------|------|---------|---------|
| | | No. | Percent | No. | Percent | No. | Percent | |
| Case-control | Failure to precisely and appropriately mention how to enroll cases | 1 | 33 | 2 | 66 | 3 | 37 | 0.01* |
| | Failure to precisely and appropriately mention how to enroll controls | 1 | 33 | 2 | 75 | 1 | 12 | 0.01* |
| | Failure to precisely define exposure factor | - | - | - | - | - | - | - |
| | Failure to mention acceptable criteria for case group | 2 | 66 | 1 | 33 | - | - | 0.01* |
| | Failure to mention acceptable criteria for control group | 1 | 33 | 1 | 33 | - | - | 0.01* |
| Cohort | Failure to precisely define exposure and its levels | - | - | 2 | 66 | 3 | 33 | 0.01* |
| | Failure to mention how to deal with the missing cases and how to analyze | - | - | 2 | 75 | 5 | 55 | 0.01* |
| Clinical trial | Failure to precisely define the intervention | - | - | - | - | - | - | - |
| | Failure to precisely explain how control group was enrolled and its potential differences from intervention group | 7 | 64 | 8 | 72 | 16 | 80 | 0.01* |
| | Failure to mention how to do randomization | 9 | 82 | 7 | 63 | 13 | 65 | 0.01* |
| | Failure to mention blinding and how to do it | 8 | 72 | 3 | 27 | 8 | 40 | 0.01* |
| | Failure to exactly mention inclusion criteria | 1 | 9 | - | - | 3 | 15 | 0.04* |
| | Failure to exactly mention exclusion criteria | 1 | 9 | - | - | 1 | 5 | 0.05* |
| Experimental studies | Failure to mention animals' age | 2 | 22 | - | - | - | - | 0.01* |
| | Failure to mention animals' specifications (race, type, sex, etc.) | 2 | 22 | - | - | 1 | 25 | 0.05* |
| | Failure to give the reason for enrolling the animals | 4 | 44 | - | - | 1 | 25 | 0.03* |
| | Failure to mention animals' maintenance conditions (light, temperature, feeding, surroundings, etc.) | 2 | 22 | - | - | 1 | 25 | 0.05 |
| Descriptive studies | Failure to mention the time of study | 2 | 4 | 2 | 2.6 | 1 | 1 | 0.05 |
| | Failure to mention the place of study | 1 | 2 | 1 | 1.5 | 2 | 2 | 0.02 |
| | Failure to clearly mention the target population | 10 | 18 | 18 | 23 | 35 | 36 | 0.03* |

*The difference is significant.

Table 3. The distribution of common errors in the *Results* of the papers published in JSKUMS, JRMS, and other medical journals under study within 2010-2011

| The most common errors | JSKUMS | | Other medical journals | | JRMS | | P value |
|---|--------|---------|------------------------|---------|------|---------|---------|
| | No. | Percent | No. | Percent | No. | Percent | |
| Failure to mention the frequency and percentage of confidence intervals for descriptive indices if needed | 5 | 9 | 11 | 14 | 2 | 2.1 | 0.01* |
| Failure to mention mean | 8 | 15 | 3 | 4 | - | - | 0.01* |
| Failure to mention distribution indices if needed | - | - | 6 | 8 | - | - | 0.01* |
| Failure to mention descriptive indices if needed | 4 | 7 | 12 | 16 | - | - | 0.01* |
| Figures' analysis in the Results | 7 | 13 | 2 | 3 | - | - | 0.01* |
| Failure to exploit appropriate summarization methods | 14 | 26 | 14 | 18 | - | - | 0.01* |
| Failure to observe instructions of drawing tables | 16 | 30 | 13 | 17 | 29 | 30 | 0.01* |
| Failure to observe the instructions of drawing graphs | 19 | 35 | 9 | 25 | 35 | 36 | 0.03* |

*The difference is significant.

4. Discussion

The epidemiological studies are divided, according to their practical value, into five levels of which the first level is assigned to interventional studies (full-scale clinical trials) and the second, third, fourth, and fifth level to prospective and historical cohorts; case control studies and/or systematic review of controlled studies; descriptive studies; and comments by experts with no clear and critical analysis respectively. Currently the journals compare their articles with others' using this grading (Man et al., 2004; Jalalabadi and Taheri, 2004; Tabatabaee and Fazelzadeh, 2009; Malek Afzali et al., 2004).

As there are few similar studies conducted in Iran, comparisons are made between the present study and the published ones. In addition, the time of conducting research and the potential changes in journals should be considered when making comparisons. According to the findings of the present study, 93% of the articles in JSKUMS were original and mainly analytical, which could be a strength compared to the other journals (Tabatabaee and Fazelzadeh, 2009; Valaei et al., 2006; Guilford, 2001; Moin et al., 2007).

In JSKUMS the proportion of interventional (in addition to clinical trial and experimental) studies is up to 37% and that of cross-sectional studies 48%, which is better compared to other medical journals under study whose proportion of original research and clinical trials is respectively 85% and 15%. In assessing Journal of Mazandaran University of Medical Sciences from 2001 to 2005 the proportion of descriptive, analytical-epidemiological, clinical trial, and experimental studies was reported respectively 39%, 7%, 20%, and 21% (Valaei et al., 2006). In addition, the corresponding indices in JSKUMS enjoy a better and more favourable status compared to the articles published by faculty members of Shiraz University of Medical Sciences in different medical journals of Iran within a five-year period (Tabatabaee and Fazelzadeh, 2009). Case-control and cohort studies had a small proportion in JSKUMS, indicating that less analytical (case-control and cohort) studies have been published in JSKUMS compared to other medical journals under study (for example Journal of Mazandaran University of Medical Sciences) and similar studies (Tabatabaee and Fazelzadeh, 2009; Valaei et al., 2006).

In all articles published in JSKUMS the title of study was mentioned in *Materials and method*, which is much better compared to other medical journals under study and JRMS in which the title was unspecified in *Materials and method* of 20-30% of the articles. In addition the title of study was not mentioned in *Materials and method* of 37% of the

articles in Journal of Mazandaran University of Medical Sciences (Valaei et al., 2006).

It is notable that the address of corresponding author in 56% of the articles in JSKUMS was related to the employees of Shahrekord University of Medical Sciences, indicating that the acceptance of the articles authored by employees of other universities in JSKUMS is acceptable compared to other medical journals with a corresponding rate of 83%, or there could be no bias in giving acceptance to the articles authored by other institutions' employees in JSKUMS. This rate was up to 95% for Medical Journal of Tabriz University of Medical Sciences and 80% (in 2009) for JRMS. It seems that the journals tend to increase satisfaction of the faculty members of their own respective universities by considering this index (Ashraf Ganjooei et al., 2008; Jahani and Rafiei, 2009).

In 2008, the mean number of the articles published in other medical journals under study (with an average of 20 per season) was higher compared to that of JSKUMS (with an average of 14 per season) ($p=0.002$).

As Iran's medical journals have different publication frequencies (for example monthly, bimonthly, and quarterly), this comparison deserves more attention and standardization in future studies. The present study offers the following recommendations for improving and promoting Iran's medical journals qualitatively: holding workshops on methodology and advanced applied statistics to further empower researchers, article authors, and reviewers; publishing self-study articles with epidemiology-related subjects in journals; adequate attention to revising reviewer checklists by reviewers and editorial boards; special attention to the issues of appropriate design and analysis of clinical trials (such as randomization, blinding, and dealing with missing cases); inadequate attention to applying descriptive and analytical statistics indices in journals including failure to report confidence intervals for descriptive indices and the required analytical indices.

5. Conclusion

In the present study, the findings indicated that the authors of the articles published in JSKUMS paid less-than-deserved attention to the following issues as the most commonly observed errors: sampling method and its related issues, and mentioning them if needed; mentioning the time and place of the study if needed; data gathering instruments, their validity and reliability, and the used software, and mentioning them if needed; the informed consent, ethics committees' letters of agreement, and mentioning them if needed;

observance of specific framework and methodology of analytical studies such as case-control and cohort; issues of appropriate design and analysis of clinical trials (such as randomization, blinding, and dealing with missing cases); and applying descriptive and analytical statistics indices in journals including failure to report confidence intervals for descriptive indices and the required analytical indices. JSKUMS had a more favourable status in some indices and similar status in some other compared to other medical journals under study and JRMS.

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