

Letter to the Editor

STATISTICS IN INTERNATIONAL MEDICAL JOURNALS OF IRAN

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Despite some notable success in the acceptance by the medical community that biostatistical concepts are an integral part of sound medical research, the misuse of statistics in medical papers remains common.¹ The poor quality of much medical research is widely acknowledged, yet disturbingly the leaders of the medical profession seem only minimally concerned about the problem and make no apparent efforts to find a solution. We need less research, better research, and research done for the right reasons.² Emerson and Colditz³ have surveyed the use of statistical analysis in the New England Journal of Medicine (NEJM), one of the leading medical journals of Europe.

A survey was carried out on the statistical methods used in the "Original Papers" published in the two international medical journals of Iran, namely the Iranian Journal of Medical Sciences (IJMS) and the Medical Journal of the Islamic Republic of Iran (MJIRI) during a post-war decade from 1989-1998. While the former has been published since 1970 by Shiraz University of Medical Sciences, located in Shiraz (Southern Iran), a city known as the cultural capital of Iran, the latter is sponsored by the Iranian Ministry of Science, Research and Technology and has been published since 1987. Each of these journals publish papers based on a peer reviewing system. The journals are published quarterly. Volumes 20-29 of IJMS (298 papers) and 3-12 of MJIRI (603 papers) were surveyed. A 20% stratified random sample of original papers using probability proportional to size scheme was applied to obtain the data of Table I. Year and season of publication of each of the two journals were taken as sampling strata. Each of the original papers selected in the sample was assessed by one of the authors of this paper using groupings of Emerson and Colditz³ and cross-checked by another one. The findings have been compared with those of The New England Journal of Medicine in 1979-1987³ and 1990.¹

Figure 1 displays the trend of published papers by year of publication in the two studied journals. The proportion of original papers was maximum in 1993 in IJMS. This proportion had an increasing pattern until 1996 in MJIRI.

Table I presents the proportion (%) of original pa-

pers in Iranian Journal of Medical Sciences (IJMS) during 1989-1998, the Medical Journal of the Islamic Republic of Iran (MJIRI) during 1989-1998, The New England Journal of Medicine during 1978-1979 (NEJM79) and the first hundred papers published in New England Journal of Medicine in 1990 (NEJM90). The number of statistical procedures used in IJMS and MJIRI were 67 (1.4 per paper) and 127 (1.6 per paper) respectively, very similar to NEJM (1.5 per paper). Use of inferential and advanced statistics in NEJM was significantly higher than the two Iranian journals ($p < 0.001$). However, no significant difference was found in the use of statistical procedures between the two Iranian Journals.

The distribution of papers published in the two journals was not homogeneous between original and other articles in MJIRI ($p < 0.005$), while homogeneity of distribution of papers was not significant in IJMS ($p = 0.168$). A significant linear trend was observed in MJIRI during the decade of 1989-1998 ($p < 0.001$).

However, no significant time trend was seen in IJMS during the same period of study ($p = 0.294$).

There are strong arguments for increasing the number of statisticians in medical research.⁴ They would not eliminate statistical errors, but their direct and indirect influence should certainly be of major benefit to the quality of medical research.

The idea that the use of statistical referees should improve the statistical quality of published papers is self-evident, but there is little evidence to support it. The percentage of contributions of statisticians to authors in the studied journals was around 2%, which was minimal. This situation needs to change. A good idea is that each papers should benefit from a statistician as a coauthor. Given the average number of authors per paper, a good index was calculated to be 34%.

Almost 49% (389) of authors of IJMS were from Shiraz University of Medical Sciences, while only 42% (484) of authors of MJIRI were from the 6 medical universities of Tehran, reflecting that the latter follows a more open minded system in publishing papers from universities located outside of Tehran. This is approved when one sees that 16% (187) of the authors of MJIRI were from non-Iranian universities in comparison to

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Table I. Proportion (%) of original papers in Iranian Journal of Medical Sciences (IJMS) 1989-1998, the Medical Journal of the Islamic Republic of Iran (MJIRI 1989-1998), and the New England Journal of Medicine, 1978-1979 (NEJM79) and 1990 (NEJM90).

Procedure	IJMS (n= 48)	MJIRI (n= 78)	NEJM79 (n= 332)	NEJM90 (n= 100)
No statistical method or descriptive statistics only	90	95	27	11
t-test	17	17	44	39
Contingency tables	8	9	27	30
Pearson correlation	6	6	12	17
Non-parametric tests	2	3	11	25
Any survival analysis or logistic regression	0	0	11	32
Regression for survival or logistic regression	0	3	*	27
Life-table	0	0	*	19
Other survival analysis	4	0	*	15
Epidemiological statistics	4	1	9	13
Simple linear regression	2	3	8	18
Analysis of variance	0	12	8	14
Transformation	0	1	7	8
Multiple regression	0	1	5	6
Non-parametric correlation	0	0	4	9
Multiway tables	0	0	4	7
Multiple comparisons	2	8	3	5
Adjustment and standardization	0	1	3	1
Other methods	2	1	3	19

*Not given.

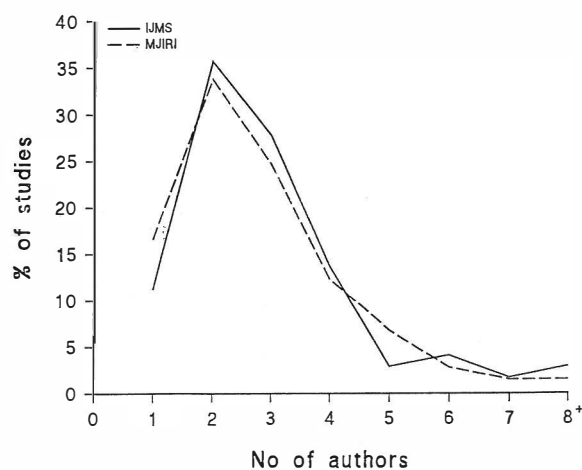


Fig. 1. Distribution of authorship number in Iranian international medical research journals.

Table II. Descriptive statistics of authors for each original article in the studied journals (IJMS & MJIRI) during the decade of 1989-1998.

Journal Statistics	IJMS	MJIRI	Total
Total number of papers	232	373	605
Total number of authors	734	1124	1858
Total number of statisticians	16	22	38
Median number of authors	3	2	3
% of statisticians to authors	2.2	2.0	2

IJMS whose contribution of non-Iranian authors was only 5% (41) during the decade of 1989-1998, giving contribution of the former about 5 times that of the latter.

We conclude that all papers should be reviewed by a

competent statistician prior to publication. The statistical reviewers should see the revised manuscript and the journals should publish their policy on statistical review. These concur with George's⁵ and Altman's⁶ recommendations.

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