SHORT COMMUNICATION

PROFILE OF 'ORIGINAL ARTICLES' PUBLISHED IN 2016 BY THE JOURNAL OF AYUB MEDICAL COLLEGE, PAKISTAN

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Journal of Ayub Medical College (JAMC) is the only Medline indexed biomedical journal of Pakistan that is edited and published by a medical college. Assessing the trends of study designs employed, statistical methods used, and statistical analysis software used in the articles of medical journals help understand the sophistication of research published. The objectives of this descriptive study were to assess all original articles published by JAMC in the year 2016. JAMC published 147 original articles in the year 2016. The most commonly used study design was cross-sectional studies, with 64 (43.5%) articles reporting its use. Statistical tests involving bivariate analysis were most common and reported by 73 (49.6%) articles. Use of SPSS software was reported by 109 (74.1%) of articles. Most 138 (93.9%) of the original articles published were based on studies conducted in Pakistan. The number and sophistication of analysis reported in JAMC increased from year 2014 to 2016.

Keywords: Statistics Software; Pakistan Publication; JAMC; Research Journal

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INTRODUCTION

Statistical methods infer meaning from quantitative data and guide decision making. Assessing the trends of study designs employed, statistical methods used, and statistical analysis software used in the published articles of medical journals help understand the sophistication of research published. Several studies have been published, assessing various medical journals, for the study types published, and use of their statistical content and choice of analysis software used.[1–7]

Pakistan has three biomedical journals indexed by Medline, with Journal of Ayub Medical College (JAMC) being the only quarterly journal. The JAMC was indexed by Medline in January, 2001.[8] Two studies have reported at the statistical tests used and statistical analysis software used in the original articles published by the Pakistani Medline indexed journals, in the years 2014 and 2015.[5–6] The study based on original articles published in the year 2014 included JAMC.[5] While the study based on original articles published in 2015, did not include JAMC.[6] However, it also reported on study designs used in the original articles published.

In year 2014, JAMC published 130 original articles, with 51 (39.2%) using statistical tests for bivariate analysis e.g. t-tests and Chi-Square test, being the most type of statistical tests employed[5]. Regarding use of statistical analysis software, SPSS was the most commonly used software with 94 (72.3%) original articles reporting its use.[5] Similar pattern of statistical tests and statistical analysis software use were reported in the years 2014 and 2015, from the two other Pakistani Medline indexed journals namely, Pakistan Journal of Medical association, and the Journal of the College of Physicians and Surgeons.[5,6]

The objectives of this descriptive study were to assess all original articles published by JAMC in the year 2016, in terms of study design employed, use of statistical tests applied, choice of statistical analysis software used, countries where studies were conducted, and number of studies using animal subjects.

METHODS AND RESULTS

Original articles published in the quarterly Journal of Ayub Medical College (JAMC), in the year 2016 were downloaded from the JAMC website. The JAMC website allows free access and download of all articles. Every article published as 'Original Article' was categorized in terms of study type, country where study was conducted, statistical tests applied, statistical analysis software used for data analysis, and whether human or animal subjects were used. All the information was gleaned from the 'Methodology' section of each original article. In few instances, 'Abstracts' of articles were also reviewed for gathering pertinent information. Study type, and use of statistical tests reported were taken at face value, i.e., no attempt was made to determine the veracity of either study design used or appropriateness of statistical tests applied. In few instances, 'Methodology' section did not provide the name of statistical tests used, but the 'Results' section reported p-values. For these original articles, determination of statistical tests used was done, based on findings reported in the 'Results' section.

Based on type and number of variables used, statistical tests were categorized into five groups, with sixth group comprising of category of 'other' encompassing one policy review paper application of statistical test was not required. Original articles reporting only descriptive indices involving one variable like frequency, percentages, and means were grouped together. Articles reporting statistical tests involving two variables (bivariate analysis) were categorized into two groups; one involving, sensitivity, specificity, positive and negative predictive value, and accuracy, while the other group involved all the other bivariate statistical tests e.g. chi-square and t-tests. Statistical tests involving time-to-event data were grouped separately. While all statistical tests involving multivariate analysis, i.e., involving three or more variables were categorized in a separate group. All original articles were also categorized based on the type of statistical analysis software used and reported, however, software used for data entry were not categorized.

All original articles were categorized next, based on type of study design reported into ten groups, that included the groups of 'other', and 'not specified' i.e., where authors did not mention the study design either in the 'Methodology' section or in the 'Abstract' of the article. Finally, all original articles were further categorized based on use of either human or animal subjects, and the country where study was conducted. In this descriptive study, data were analysed in terms of frequencies and percentages, using the Open-Source statistical software Python version 3.5.4.

Cumulatively, JAMC published 147 original articles in the year 2016. Table-1 provides the frequencies and percentages of statistical tests reported in original articles by JAMC in 2016. Statistical tests involving bivariate analysis were the most commonly reported statistical tests in original articles. As 73 (49.6%) original articles were categorized in this group. The second most common group of statistical tests was original articles reporting descriptive indices involving one variable like frequencies and means, with 42 (28.6%) original articles.

Table-2 provides the frequencies and percentages of statistical software use reported in original articles published by JAMC in 2016. Use of SPSS was reported by 109 (74.1%) of original articles. The versions of SPSS used, ranged from version 10–22, with one of the 109 original articles not specifying the version used. The two most common SPSS software versions used were version 17, and 20, with 23 (21.3%), and 22 (20.4%) out of 108 original articles reporting its use, respectively. While 33 (22.4%) original articles did not specify any specific analysis, software used.

Table-3 provides the frequencies and percentages of type of study designs reported in 'Original Articles' published by JAMC in 2016. The most commonly used study design was cross-sectional studies, with 64 (43.5%) original articles reporting its use. While the next most common design involved use of some intervention e.g. experimental, randomized/non-randomized clinical trials, and pre-post study designs, with 20 (13.6%) original articles reporting its use.

Most 138 (93.9%) of the original articles published were based on studies conducted in Pakistan. With two studies, each conducted in Iran and Nepal, and one study each in Oman, Thailand, Yemen, Saudi Arabia, and England. Only two (1.4%) original articles published in 2016 were animal-based studies.

Table-1: Statistical tests reported in original articles by the Journal of Ayub Medical College (JAMC) in 2016 (n=147)

Groups	Statistical Tests	Frequency (%)
Group 1	Frequencies, Percentages, Proportions, Range, Mean/SD, Median/IQR, Confidence Interval	42 (28.6)
Group 2	t-test, Chi Square/McNemar, Mann-Whitney U, Pearson Correlation, Spearman Correlation, Intra Class Correlation Coefficient, Kendall's tau, Relative Risk, Odds Ratio, Kappa, Wilcoxon Signed Rank	73 (49.6)
Group 3	Kaplan Meier Survival Curve, Log-Rank Test, Cox Proportional Hazards	2 (1.4)
Group 4	Linear Regression, Logistic Regression ANOVA, Kruskal-Wallis test	24 (16.3)
Group 5	Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value, Accuracy	5 (3.4)
Group 6	No statistical test needed	1 (0.7)

Table-2: Use of statistical software reported in original articles published by the Journal of Ayub Medical College (JAMC) in 2016 (n=147)

Statistical Software	Frequency (%)
SPSS	109 (74.1)
Minitab	1 (0.7)
STATA	1 (0.7)
NVivo	1 (0.7)
Use of two software	1 (0.7)
Not Specified	33 (22.4)
Not Applicable	1 (0.7)

Table-3: Type of studies reported in 'Original Articles' published by the Journal of Ayub Medical College (JAMC) in 2016 (n=147)

Study Type	Frequency (%)
Cross Sectional	64 (43.5)
Randomized Control Trial, Interventional, Pre-Post, Experimental, Quasi Experimental, Non-Randomized Control Trial	20 (13.6)
Case Series	16 (10.9)
Retrospective, Retrospective Review, Retrospective Chart Review, Retrospective Analysis	12 (8.2)
Observational	7 (4.8)
Case Control	4 (2.7)
Prospective	4 (2.7)
Descriptive	3 (2.0)
Other	11 (7.5)
Not Specified	6 (4.1)

DISCUSSION

Journal of Ayub Medical College (JAMC) is the only Medline indexed biomedical journal of Pakistan that is edited and published by a medical college. In the year 2016, JAMC published 147 original articles; this represents a 13.1% increase from the year 2014, when it published 130 original articles. In both years, i.e., 2014 and 2016, the most common type of statistical tests reported involved bivariate analysis. In the year 2014, 39.2%, and in year 2016, 49.6%, original articles reported their use. This represents an increase of 10.4 percentage points, in the use of bivariate statistical tests. Regarding multivariate statistical tests, that involve three or more variables; in the year 2014 and 2016, 9.2% and 16.3%, original articles respectively, reported their use. Which represents an increase of 7.1 percentage points.

The SPSS software for statistical analysis remains the most popular software in the Pakistani biomedical researchers publishing in Pakistani Medline indexed biomedical journals.[5–6] In the year 2014 and 2016, 72.3% and 74.1% original articles respectively, reported its exclusive use for data analysis. Registering an increase of 1.8 percentage points. None of the original articles in the year 2016, reported use of either R or Python, the Open-Source statistical analysis software freely available online for download.

The cross-sectional study design was the most commonly reported study design, with 64 (43.5%) original articles published in the year, reporting its use. Cross sectional study design was also reported as the most common study design in the year 2015, by other two biomedical Medline indexed journals of Pakistan[6]. Most of the original articles published by JAMC in 2016 were based on studies conducted in Pakistan; there were 9 (6.1%) original articles based on studies conducted abroad including Asia, Middle East and Europe.

Future studies need to assess indexed as well as non-indexed Pakistani biomedical journals, and all articles published, including short reports/communications, to better understand the profile of health and biomedical research conducted and published in Pakistani journals.

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