CONTRIBUTIONS TO INDIAN JOURNAL OF PSYCHIATRY: COMMON STATISTICAL AND OTHER DEFICIENCIES

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SUMMARY

The present investigation is an attempt to find the extent of statistical error and other deficiencies in the articles published in the Indian Journal of Psychiatry from April 1986 to January 1987. A sample of 26 articles was chosen by selecting every alternate article published in these four issues. It was found that 20 articles (77%) were deficient in statistical aspects. All the 26 articles were found deficient when non-statistical errors were also taken into consideration. The errors were categorized into seven broad categories. Commonly seen errors were in data analysis, methodology and citing references. Finally, some recommendations have been made for improving the quality of published articles in Psychiatric Journals.

Introduction

Publication in journals is an important means of communicating results of scientific studies. Proper expression of findings is as important as the quality of the research. Despite many investigators pointing out common errors encountered, the improvement in the quality of articles published in scientific journals has not been satisfactory (Verma et al. 1985, Srivastava et al. 1985, Chandiramani et al. 1987, Verma 1982, 1985, Verma et al. 1988, etc.).

The publication of a paper itself implies that the work is sound and useful. The results of published articles are likely to influence medical practice as well as future research in the subject. It is therefore, important that the study is carried out properly and the data generated is handled by using sound statistical methods (Verma et al. 1985). Sometimes an incompetent and misleading analysis of data can lead to wastage of a good biological work (Yates and Healey 1964). It is likely that the articles submitted by different investigators will differ in the manner of their presentation. Hence the ultimate responsibility for bringing some uniformity in the style of presentation of articles lies with the editorial boards of medical journals.

In the present study an attempt has been made to find out the extent of statistical errors and other deficiencies in the articles recently published in Indian Journal of Psychiatry and to suggest ways of improving the quality of published articles in the Journal.

Material and Methods

Four issues of Indian Journal of Psychiatry from April 1986 to January 1987 were chosen for scrutiny. The sample constituted 50% of the total articles published in these issues by selecting every alternate article.

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Twenty six articles were thus assessed for various statistical and other deficiencies. Some of the articles like presidential address, editorials, case reports and letters to the Editor were not assessed.

All the articles were assessed independently by all the three investigators and individual ratings were compared. In four cases where there were differences in the assessment of different raters, joint discussions were carried out to facilitate consensus. Only those errors upon which there was mutual agreement of all the three investigators were included in the results.

The errors were categorized into seven broad categories which were decided beforehand. These categories were selected after careful scanning of available literature (Srivastava et al. 1985, Verma et al. 1977, Lionel & Herxheimer 1970). The subcategories for errors were finalised only after the completion of assessment of all articles. The choice of the design of the study was not assessed although it may also be an important consideration.

**Results**

Out of the total number of 26 articles, 20 articles (77%) were found to have one or more statistical errors. It was found that all the 26 articles were deficient if non-statistical errors were also taken into consideration.

Table 1 shows various error categories and the number of articles deficient in each category. Commonly seen errors are in the areas of data analysis, methodology and citing references.

Table 2 to 8 show further subcategorisation of various error categories along with the number of articles deficient in each sub-category.

| Table 1: Various Error Categories and number of articles deficient |
|---------------------------------|------------------|-----------------|
| Error Categories                | Number of Articles Deficient (n = 26) | % |
| Material & Method               | 14               | 53.8            |
| Data description                | 12               | 46.2            |
| Data analysis                   | 18               | 69.2            |
| Discussion & write-up           | 9                | 34.6            |
| Conclusions                     | 7                | 26.9            |
| References                      | 13               | 50.0            |
| Others                          | 5                | 19.0            |

Table 9 compares the results of the present study with some of the similar studies in psychiatry and other medical specialities carried out both in India and abroad.
Table 3
Errors in Data Description

| Errors Sub-category                      | Number of Articles Deficient (n = 26) |
|----------------------------------------|--------------------------------------|
| 1. Tabulation errors                   |                                      |
| - No title                             | 10                                   |
| - Age categories - Unequal             | 3                                    |
| - Over-lapping                         | 2                                    |
| - Mathematical errors - Summing-up     | 1                                    |
| - Computing mean                       | 1                                    |
| - Wrong title                          | 1                                    |
| - Redundant table                      | 2                                    |
| - Inconsistency between tables and text| 1                                    |
| - Missing variables - (Different combinations in different tables with no explanation) | 1 |
| Basic data missing (Interpretation given) | 2 |
| Figures wrongly presented              | 1                                    |

Table 4
Errors in Data Analysis

| Errors Sub-category                      | Number of Articles Deficient (n = 26) |
|----------------------------------------|--------------------------------------|
| Test of significance used but          |                                      |
| values and/or level of significance not| 9                                    |
| mentioned                               |                                      |
| Test of significance used but not      | 5                                    |
| mentioned                               |                                      |
| Inadequately analysed data             | 4                                    |
| Test of significance not applied       | 2                                    |
| correctly                               |                                      |
| No evidence of data analysis           |                                      |
| (findings given directly)              | 1                                    |
| No mention whether non-normality       |                                      |
| (skewed distribution) of scores        | 1                                    |
| is taken into consideration            |                                      |

Table 5
Errors in Discussion and Write-up

| Errors Sub-category                      | Number of Articles Deficient (n = 26) |
|----------------------------------------|--------------------------------------|
| Data relevant to the findings discussed| 5                                    |
| not presented                          |                                      |
| Objectives not completely covered      | 2                                    |
| in the discussion                      |                                      |
| Mutually inconsistent statements       | 1                                    |
| Value statements                       | 1                                    |
| Findings interpreted without taking    | 1                                    |
| into consideration known facts         |                                      |
| Information outside the scope of      | 1                                    |
| aims of the study                      |                                      |
| Findings in contrast with previous     | 1                                    |
| studies not discussed                  |                                      |

Table 6
Errors in Conclusions

| Errors Sub-category                      | Number of Articles Deficient (n = 26) |
|----------------------------------------|--------------------------------------|
| Unjustified conclusions                | 6                                    |
| - Not based on data presented         | 4                                    |
| - Based on insignificant findings      | 4                                    |
| - Illogical                            | 1                                    |
| Inability to draw logical inferences  | 1                                    |
| Conclusions not drawn                  | 1                                    |
| (only findings restated)               |                                      |

Table 7
Errors in References

| Errors Sub-category                      | Number of Articles Deficient (n = 26) |
|----------------------------------------|--------------------------------------|
| Year wrongly mentioned                 | 7                                    |
| Missing references                     | 4                                    |
| Error in Author's names                | 3                                    |
| Reference improperly cited in the text | 2                                    |
| Reference cited differently at different places | 1 |

Discussion

It is important to note that a considerable number of articles recently published in the journal reviewed are deficient in statistical and other aspects. Similar
Table 8
Errors not classified elsewhere

| Errors Sub-category                                      | Number of Articles Deficient (n = 26) |
|--------------------------------------------------------|--------------------------------------|
| Inconsistency between summary and main article          | 3                                    |
| Inadequate summary                                      | 1                                    |
| (Result not mentioned)                                  |                                      |
| Scoring method of Rorschach not mentioned               | 1                                    |

Table 9
Extent of statistical errors detected by some assessors of medical journals

| Authors        | Year | Types of Literature reviewed | Papers having statistical errors % |
|----------------|------|------------------------------|----------------------------------|
| 1. Schor and Karten | 1966 | Medical journal manuscripts  | 72.5                             |
| 2. Lionel and Herzheiner | 1970 | Therapeutic Trials           | 49.0                             |
| 3. Rao et al.   | 1977 | Indian Journal of Medical Research, Indian Journal of Medical Sciences & Indian Journal of P & SM | 78.0                             |
| 4. Gore et al.  | 1977 | British Medical Journal       | 52.0                             |
| 5. White        | 1979 | British Journal of Psychiatry | 45.0                             |
| 6. Glantz       | 1980 | Literature on Medical Research | 44.0                             |
| 7. Gardner et al.| 1983 | Papers appeared in and Manuscripts submitted to British Medical Journal | 37.0 | (95.0*) |
| 8. Present Study| 1988 | Indian Journal of Psychiatry  | 76.9 | (100.8*) |

* Also includes articles with non statistical errors.
Main Source: Verma et al. (1985)

British Medical Journal (Gore et al. 1977) reveals that the proportion of errors in Indian Journal of Psychiatry is considerably higher than the British Journals (see table 9). However, such comparisons remain suspect because of variation in the methods of assessment, sensitivity of the assessors in picking up errors and the importance attached to various types of errors. Despite these limitations, findings common to all the observations can be identified.

Rao et al. (1977) have pointed out that though utilization of statistical techniques has been initiated, proper application of these at different stages has been far from satisfactory. This is probably because of lack of comprehension of the application of statistical methods in medical research.

A similar observation has been made by Verma et al. (1985) who have reported that it is highly desirable for various reasons to prevent misuse of statistical methods and enhance statistical quality of medical papers.

Sampling errors (inadequate descriptions of sample characteristics and sampling technique), tabulation errors, errors in reporting tests of significance used, inadequately analysed data, vague or unjustified conclusions, etc. were quite frequent. Some of these errors are avoidable and should be avoided. In addition, wrong and inadequate references, wrongly mentioned and missing references, errors in authors name etc. are due to carelessness and oversight rather than due to lack of knowledge. These can be corrected easily.

Suggestions made by some of the investigators in this area can be summarized in the form of following recommendations:

1. Teaching of statistics to under-graduate
and post-graduate medical students should be strengthened by developing a new course content according to their future needs.

2. A statistician should either be part of the research team or be consulted before a study is attempted. It is necessary because a sizeable number of articles are deficient in the method of sampling, planning and design of studies, considering variables for study, standardization of interview technique and measurement procedures which could be corrected by consulting a statistician at the time of planning the research.

3. Statistical guidelines for contributors to medical journals should be strictly followed by the authors. Every manuscript should be reviewed statistically before sending for publication.

4. Since the ultimate responsibility for the general standard of publication lies with the editorial board of medical journals, it is recommended that the journal should institute more strict screening procedures. Every submitted paper should be reviewed by at least one statistical expert to assess the soundness of the statistical method employed. Detailed guidelines for the contributors should be published in the journal from time to time.

References

CHANDIRAMANI, K., DUDANI, I.D & VERMA, S.K. (1987) A study of error in papers published in the Indian Journal of Psychiatry. Annual Conference of Indian Association of Medical Statistics. Srinagar, September.

GARDNER, M.J., ALTMAN, D.G., JONES, D.R. & MACHIN, D. (1983) Is the statistical assessment of papers submitted to the "British Medical Journal" effective? British Medical Journal. 286, 1485-1488.

GLANTZ, S.A. (1980) Biostatistics: How to detect, correct and prevent errors in the medical literature. Circulation. 61, 1-7.

GORE, S.M., JONES, I.G. & RYTTER, E.C. (1977) Misuse of statistical Methods: critical assessment of articles in BMJ from January to March 1976. British Medical Journal. 1, 85-88.

LIONEL, N.D.N. & HERXHEIMER, A. (1970) Assessing reports of therapeutic trials. British Medical Journal. 3, 637-40.

RAO, N.S.N., SETH, A.K., MURTHY, N.S. & MARWAH, S.M. (1977) Some statistical deficiencies in medical research in India. Indian Journal of Medical Research. 66, 4, 696-703.

SCHOR, S. & KARTEN, I. (1966) Statistical evaluation of Medical Journal Manuscripts. Journal of American Medical Association. 195, 1123-1128.

SRIVASTAVA, R.N., VERMA, B.L. & SHUKLA, G.D. (1985) Principles and practice of statistics in medicine. Bombay, Himalaya Pub. House.

STANLEY, S. (1966) Statistical evaluation of Medical Journal Manuscripts. Journal of American Medical Association. 195, 13, 1123-1128.

VERMA, B.L., SHUKLA, G.D. & SRIVASTAVA, R.N. (1985) Current status of statistics in medical research publications. In Srivastava, R.N., Verma, B.L. and Shukla, G.D. (Eds.) Principles and Practice of Statistics in Medical Research. Himalaya Pub. House, Bombay. pp 56-70.

VERMA, S.K. (1982) A critical analysis of research in clinical psychology in India. Bombay Psychologist. 3(2) and 4(1), 75-82.

VERMA, S.K. (1985) Uses and misuses of statistics in Indian Psychiatric Research. Observations based on papers published in Indian Journal of Psychiatry. In Srivastava, R.N., Verma, B.L. and Shukla, G.D. (Eds.) Principles and practice of statistics in medical research publications. Himalaya Pub. House. Bombay pp. 86-93.

VERMA, S.K., CHANDIRAMANI, K. & VERMA, A. (1988) Contributions to Indian Journal of Psychiatry: An analysis of the last 65 issues. Read at Annual Conference of I.P.S., Varanasi.

WHITE, S.J. (1979) Statistical errors in papers in the British Journal of Psychiatry, British Journal of Psychiatry. 135, 336-342.

YATES, F. & HEALEY, M.J.R. (1964) How should we reform the teaching of statistics? Journal of Royal Statistical Society Series A. 127, 199-210.