



**FAIMER**<sup>®</sup>

Foundation for Advancement of International Medical Education and Research

## **PSG-FAIMER Regional Institute**

### **ML-Web Assignment Report**

**Online discussion on ‘Analysis of data’ for Medical Educators in  
India: An experience**

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**PSG-FAIMER ML-Web Assignment, October 2009 Report**

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## **A) Introduction:**

An on-line faculty development learning process called ‘Mentoring and Learning Web’ (ML Web) by Regional Institute Fellows of the Foundation for Advancement of International Medical Education and Research (FAIMER) has been reported earlier.<sup>1</sup> It is a faculty development program with two residential sessions at regional centre and an 11 month, on-line ML-Web discussion as intersession moderated by Fellows and regional faculty members. Fellows interact in a listserve which is an electronic mailing list which enables them to communicate with the entire group. Apart from this, first-year Fellows carry out the Curriculum Innovation Projects (CIP), its data analysis and poster preparation at their home institutions. First-year fellows are assisted in completing their CIP with co-mentoring relationship with a second year Fellow. To further support this and to ensure timely technical help to first-year Fellows in analysis of CIP data, an ML-Web discussion on ‘Analysis of data’ was facilitated at listserve of PSG-FAIMER Regional Institute (PSG-FRI), Coimbatore, India. We did the content analysis of 154 e-mails which were exchanged during this need-based discussion on ‘Analysis of data’ and shared our experience of discussion on this neglected area in faculty development.

## **B) Material and Methods:**

The ML-Web discussion and analysis of e-mails was undertaken in three steps. These steps are described below

**B.1) Needs assessment for the discussion:** One month prior to this scheduled discussion, a team of four moderators comprising of two first-year Fellows and second-year Fellows each and two faculty members conferred on-line and reviewed all fifteen CIPs of first-year fellows. The moderators carefully examined the objectives; study designs and the evaluation plans of CIPs and decided the objectives of discussion. To further refine these objectives, an on-line survey of structured questionnaire based on quantitative data was mailed on the listserve. In addition, five open ended questions on qualitative data analysis were also mailed. To increase the response rate, fellows were contacted on their personal emails or called on their personal phone. Finally, based on the findings of survey and the proposal reviews, the discussion needs and its objectives were refined. It was decided to remain focused to the current needs or queries of the Fellows.

**B.2) Process of discussion:** The listserve discussion on ‘data analysis’ was facilitated during the month of October 2009. The topics related to analysis of quantitative data and qualitative data was introduced to learners by moderators with a short on-line ‘handout’ followed by suggested reading material sent as an e-mail attachment or links. The discussion was based on five assumptions about adult learning 1) adults are independent and self directing, 2) they are experienced, 3) they value learning, 4) they are more interested in problem centered approach and 5) they are internally motivated.<sup>2</sup> In the first week, the subject wise discussion plan was mailed and the Fellows were encouraged to express their free spontaneous responses, raise questions and share their problems and experiences. Moderators ensured prompt feedback of whether they have understood the concept or agree with them. This

activity was supervised by two faculties of PSG-FRI who were the catalyst of this entire process. Towards the end of discussion, the feedbacks from the respondents were invited.

**B.3) Data collection, analysis and reporting:** We stored the text messages of all emails which were exchanged during the discussion period. A separate folder was maintained where each email was sorted with the respondent's name and date of mail. The email responses satisfy the criterion of 'low inference descriptors' as participants do their own transcribing. In first two weeks, 93 emails were exchanged and it generated 24 page information (A4 size paper, font size-12, single spacing, and 9,739 words) on quantitative data analysis. In last two week, 61 mails were exchanged generating 19 page information (A4 size paper, font size-12, single spacing, and 7,810 words) on qualitative data analysis. The responses for initial needs assessment survey were quantified. For e-mails related to discussion, the manual content analysis was done.<sup>3</sup> The responses were analyzed by identifying and categorizing units of meaning. The email responses have characteristics of both speech and writing. Hence, the units of analysis was sentences and paragraph which were identified using topic sentences as of the beginning of units, and concluding, summary and transition statements (where used) as completion of unit. These units varied from single sentences to very lengthy text segments. The analysis was carried out by identifying various units in one complete set of responses and labeling these with categories. The categories of discussion on analysis of quantitative and qualitative data are presented as a simple non-hierarchical typology. The content of personal mails, e-mail attachment of published papers and other social mails exchanged during discussion period were excluded from the analysis. Italic text appearing in the analysis signifies direct quoting. This analysis was done by one of the moderators who have five years of experience of using qualitative data in public health research. To increase the validity of the results, it was peer reviewed by one researcher in the field of qualitative research who is not directly involved and by the PSG-FRI faculty. We tried to follow 'Consolidated criteria for Reporting Qualitative research' (COREQ) while reporting the present work.<sup>4</sup>

## **C) Results:**

**C.1) Needs for the discussion:** After reviewing the CIPs of 2009 fellows, the major topics emerged for the discussions were the 'basic concepts of statistics' (normal distribution, variables), test of significance, likert scale analysis and content analysis of qualitative data. The responses of 20 Fellows to questionnaire on quantitative data analysis emphasized need for discussion on basic topics such as scaling, the concept of normality and test of significance (Table 1). The responses to open ended questions on qualitative data analysis brought out need for discussion on topics such as methods in qualitative research, poor attitude/faith in qualitative research, apprehension about its subjective nature and lack experience for handling for such data set and reporting the qualitative research. Out of 20 Fellows who responded, 19 were using qualitative methods in their work setting, 16 Fellows did not receive any formal training in it and three were just sensitized to application of these methods, 12 Fellows were not comfortable in reporting qualitative data and six Fellows said that they were somewhat comfortable in reporting. Thus, most of the Fellows were dealing with the qualitative data, but they were not comfortable with its correct application, analysis

and reporting due to various barriers like 1) Its time consuming nature, 2) subjective nature, 3) perceived 'superior' nature of quantitative research. (Table 2)

**C.2) Discussion on quantitative data analysis:** The four categories emerged from the analysis of discussion were 1) Descriptive statistics, 2) Inferential statistics, 3) Queries related to CIPs and 4) Exercises. Under initial three categories there were three units each. Under descriptive statistics category, the topics such as best practices for data collection, basic concepts like normal distribution and development of codebook before data entry were discussed. In the second category of inferential statistics, topics discussed were analysis of variance and factor analysis of liket scale items. The third category was queries of the fellows to moderators regarding analysis in their CIPs. The queries were related to the types of variables, selection of test of significance and analysis of liket scale. The fourth category was exercises based on the real data set. These exercises were related to the development of codebook, creating a derived variable and analyzing a contingency table, selecting a test of significance and simple regression analysis (Figure 1)

**C.3) Discussion on qualitative data analysis:** The four categories raised from the discussion were 1) Types of qualitative methods, 2) Analysis of data, 3) Queries related to CIP and 4) Computer-aided content analysis. In the first category, the types of qualitative research methods such as participatory tool and techniques, in-depth techniques and systematic techniques were discussed. The application of these methods in research related to medical education was discussed and the published research papers related to it were shared. The second category of discussion was analysis of qualitative data where the steps of content analysis and the various methods to ensure trustworthiness and validity of data were discussed. During this discussion the power point presentations on transcription, coding and reporting qualitative research was shared. The queries related to CIPs were related to the procedure and reporting of focus group discussion, analysis of open ended questions and analysis of free list and pile sort data. Apart from this, a discussion on 'ethical issues in qualitative research' was discussed. The fourth category of discussion was manual vs. computer aided content analysis and the scope of software in qualitative data analysis. (Figure 2)

#### **C.4) Feedbacks from the Fellows:**

Considering relatively low response to qualitative data analysis, we obtained feedback from Fellows. Eight Fellows gave their feedback. One of them said that *the entire discussion provided framework on how to go about in analyzing and presenting the data that was procure, but I am still not comfortable with computer aided content analysis.* The other comment was that *the description and discussion were very elaborate and the examples and attachments were self explanatory.* Another Fellow said that *the discussion on qualitative data analysis was very useful. Especially, step by step process of teaching data analysis was good.* One remark was that *the team has been able to manage a rather difficult topic to easy flowing and interesting one.* Fellows expressed their wish to communicate in future for further clarifications in data analysis and its reporting. One Fellow expressed the desire to attend workshop on qualitative data analysis in future. One encouraging remark was that *I am going to use techniques like FGD and open ended questions in trying to assess what the*

*students expect from this activity and what they actually gain at the end of it. I shall use all the knowledge gained during this discussion for undertaking the research project, collecting data and analyzing it.* Towards the end of discussion one Fellow emphasized the need for development of ‘Self-Paced Learning Module on Qualitative Analysis.’

#### **D) Discussion:**

Overall, the ML-Web discussion remained focused to the objectives and needs of the Fellows. This, need-based discussion covered topics such as ‘basic concepts in statistics’ (normal distribution, variables), test of significance, Likert scale analysis and content analysis of qualitative data. Noteworthy, most of the Fellows were dealing with the qualitative data in their on-going teaching and research work, but they were not comfortable with its correct application, analysis and reporting due to various barriers like its time consuming nature; subjective nature and perceived ‘superior’ nature of quantitative research. Notably, there was a brief discussion on rarely discussed topic of ‘ethical issues in qualitative research.’ This timely discussion and feedback on ‘data analysis’ is expected to benefit first-year Fellows who are currently working on their CIPs to modify their study designs, questionnaires and analysis plan and produce technically strong research work in future. The present analysis of e-mails of ML-Web discussion on topic ‘Analysis of data’ also explored the needs of the researchers working in the field of medical education.

Recently, Louise et al emphasized importance of teaching statistics to medical undergraduates and its relevance to their future careers.<sup>5</sup> In India, basic statistics is taught as the part of undergraduate curriculum which is often ignored as it is perceived as difficult to understand.<sup>6</sup> Later, statistics gets little importance at the time of completion of dissertation of post-graduate studies. Thereafter, busy medical educators/faculty finds it difficult to attend any residential workshops on bio-statistics due to professional and social responsibilities. Interestingly, there was high response for discussion on qualitative data analysis in the first half of month and it was relatively low for qualitative data analysis in later half. The qualitative research is perceived as ‘inferior’ to quantitative work and in addition to that, this period coincided with the celebration of important festival ‘*Deepawali*’ (Festival of Lights) in India. There is no place for qualitative research in undergraduate curriculum. But often the medical educators/researchers have to handle this type of data in their teaching and research work. In India, very few workshops are organized on qualitative research methods. The latest trend in the field of research is the combined use of quantitative and qualitative research methods i.e. mixed-method design within a single data set. It is in this area that the largest abuses of qualitative data are occurring, largely because methodological principles are not followed.<sup>7</sup> The present ML-Web discussion could sensitize the Fellows regarding basic terminologies used in qualitative research, basic steps of analysis and its reporting.

It was the first discussion on topic ‘Analysis of data’ at PSG-FAIMER listserv and the initial response has been very encouraging. Our experience has shown that problem based discussion helps to elicit response. Some more experience is required to comment on the outcome of the present on-line discussion in terms of better analysis of CIPs and its scientific reporting. In India, there is little published evidence on any university led on-line support system for faculty/medical researchers to solve their problems in analysis of data. Anshu et al

have shared similar experience of on-line faculty development at CMCL-FRI, Christian Medical College, Ludhiana, India.<sup>1</sup> The present article on on-line technical support to researchers for basic data analysis of quantitative and qualitative data shares our experience as well as explores the deficiencies to be addressed for faculty development. Since, on-line learning is a relatively new technique; such early sharing of experience from ML-Web discussion becomes important.

The on-line learning is flexible, convenient and overcomes the limitations of geographical isolation.<sup>8</sup> The present approach may be up-scaled in India, where despite high penetration of internet and telecom, on-line discussions are not common.<sup>1</sup> The present recommendation should be seen in the light of some weaknesses of on-line learning such as its impersonal approach, lack of spontaneous response compared to classes, fear of getting overloaded with information and links, needs equipments, skill and access to internet services.<sup>9</sup> Active learning may not occur in an on-line environment unless the interaction is deliberately planned and encouraged by the instructor.<sup>10</sup>

**E) Conclusions:** The ML-Web discussion at PSG-FRI could successfully offer on-line technical support to Fellows in analysis of curriculum innovation projects and ensured timely feedback to their research work. It also explored a deficient area in faculty development. The present approach may be up-scaled at universities in India, where there is high coverage of internet and telecom facilities. The results and observations of the present qualitative work are based on naturally flowing but planned on-line discussion and it generates hypothesis for future research.

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**G) Tables and Figures:**

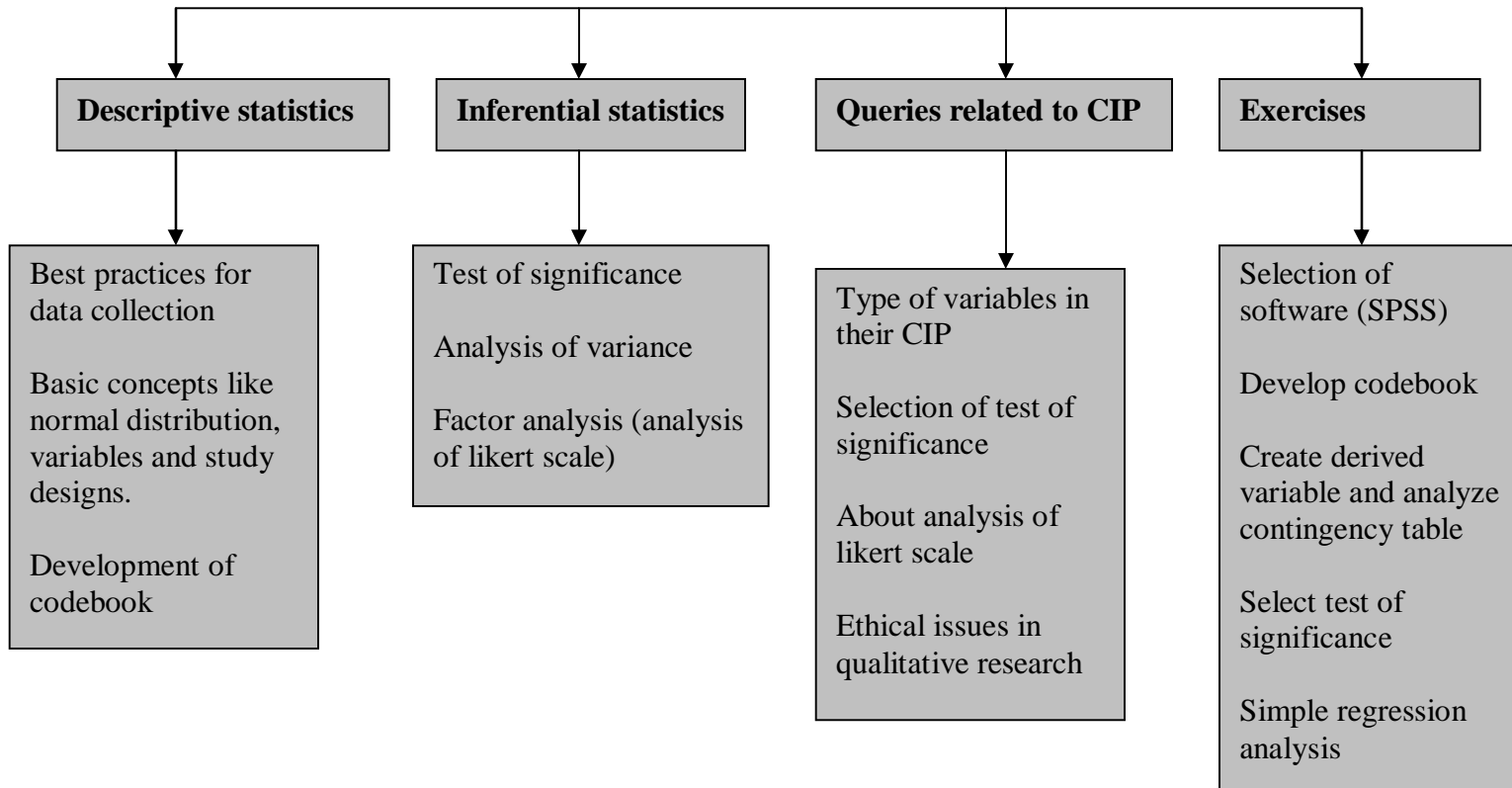
**Table 1: Responses to on-line questionnaire on analysis of quantitative data**

| <b>Correct responses</b>  | <b>N (%)</b> |
|---|--------------|
| The best 'scale' for diastolic blood pressure measurement is 'interval' (n=21)                    | 11 (52.4)    |
| Gender is 'nominal' scale (n=21)  | 19 (90.5)    |
| Five point scale is ordinal scale (n=21)  | 11 (52.4)    |
| Normality of interval or ratio scale is assessed by histogram (n=19)                              | 13 (68.4)    |
| Normality can be assessed by Shapiro-wilk test (n=18)   | 4 (22.2)     |
| Paired t test is used for paired and normally distributed data (n=20)                             | 16 (80.0)    |
| Internal consistency of likert scale is achieved by cronbach's alpha (n=17)                       | 13 (76.5)    |
| Inter rater reliability of among two rates for same checklist is assessed by Cohen's Kappa (n=16) | 10 (62.5)    |
| Wilcoxon Signed Rank test is used for paired data which in not normally distributed (n=20)        | 12 (60%)     |

**Table 2: Reasons for using qualitative research methods and barriers in its applications**

| <b>Reasons for its use? (n=20)</b>                             | <b>Barriers in the analysis of qualitative data (n=20)</b> |
|--|--|
| As part of my FAIMER CIP – 7                                   | It is time consuming process - 7                           |
| As part of research/teaching - 10                              | Lack of experience of using these methods - 4              |
| Got sensitized about it during first FAIMER onsite session – 3 | Fear of its subjective nature – 3                          |
| For obtaining in-depth responses - 1                           | Quantitative data is seen as 'superior' - 2                |
| Its easy to use – 1  | Lack of awareness of correct methodology -2                |
| -  | Can not apply test of significance - 2                     |
| -  | Require narrative skills to make it presentable -1         |

**Figure 1: Categories emerging from discussion on ‘Analysis of quantitative data’**



**Figure 2: Categories emerging from discussion on ‘Analysis of qualitative data’**

