**SPECIAL COMMUNICATION**

# DATA ANALYSIS WORKSHOPS TO ENHANCE ANALYTICAL SKILLS AMONG HEALTH PROFESSIONALS: AN EXPERIENCE OF CONDUCTING WORKSHOP WITH HANDS-ON TRAINING ON SPSS

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## INTRODUCTION

Research data often remains unanalyzed and unpublished due to incompetency in statistical software usage. Lack of planning before data collection has severely impaired the quality of research in Pakistan. Most of the researchers are unaware of usage of statistical software like SPSS, Epi info, SAS, R. and most of the Data Analysis is done through the employment of a bio-statistician, which compromises the confidentiality and increase their dependency.

Today, there are a wide variety of user-friendly software available for Data Analysis which includes SPSS,EPI Info which relatively easy to use, and there are few like STATA, SAS, and RAV Man are a bit more complicated.

Our goal is to educate faculty members and enable them to achieve an intermediate level of competency in the area of statistical software usage (SPSS). The researcher should fully comprehend the capability of this software, and be able to employ statistical tests in their research papers.

The main benefit from these workshops on data analysis is that it will give the novice and existing researcher to have a clear understanding of this software. This will allow the participants to use different statistical tests in their areas of research. In addition, it will dramatically improve skills of data analysis and they can easily interpret results in their research paper.

Concepts which allows researcher to apply regression models, e.g., logistic regression and linear regression will provide a more holistic approach to research studies. Frequently these concepts remain ignored and overlooked by the common researcher. However, we intend on eliminating this deficiencies through these workshops.

This introduction to statistical software will create a more inquisitive nature on behalf of the researcher. Furthermore this awareness will promote the usage of statistical software and ease the transition towards more complex software usage.

For the last 5 years we have been conducting workshops on data analysis using SPSS. Currently, we want to gauge the level of skills acquired after attending these workshops. We conduct 9 hour workshops over 5 days. The workshop format covers basic, intermediate, and advanced levels. We try to cover all aspects of the software training using hand-on practice sessions on each topic.

Basic analytical testing includes statistical tests like descriptive statistics, frequency tables and graph, cross tabulation, intermediate level tests include Chi-sq test and Independent sample *t*-test, correlation and Advance concepts were given with hands-on practice on Logistic Regression, Linear Regression, ANOVA and Kaplan Miers Survival Curve in SPSS.

## METHOD

Two workshops were conducted by the Department of Medical Education, Shifa College of Medicine, Islamabad. Each workshop had five sessions of 2 hours each in an interactive, hands-on, step-by-step tutorials format with written handouts and flash animated videos with pre and post testing. The majority of participants were faculty members of Shifa College of Medicine including House Officers (HOs), Medical Officers (MOs), Residents, Professors and Hospital Consultants.

Two instructors supervised these sessions of total 50 participants, using 22 computer stations in Medical Informatics Laboratory, equipped with high-speed Internet connectivity and data analysis software.

Pre-and-post tests were conducted to assess the effectiveness of these workshops. These tests checked the competency level of data analysis in SPSS. The first part of workshop covered basic organizing skills such as variable declaration, data entry, select, sort and compute .The second part dealt with basic analytical testing like descriptive statistics, frequency tables and graph cross tabulation, and intermediate level testing skills includes Chi-sq test and Independent sample t-test, correlation. The final session covered advance concepts like Logistic Regression, Linear Regression, ANOVA and Kaplan Meier Survival Curve. The participants were assessed using Multiple-Choice Questions (MCQ) based questionnaire. Later the results of pre-and-post test were analyzed using SPSS ver.16.

## RESULTS

Majority of participants were residents, HOs and MOs along with other faculty members including professors and consultants, total 51 participants came to this workshop to enhance their data analysis skills to aide them in completing their research projects. The participants were assessed using multiple-choice questions (MCQ). Understanding of data analysis skill was identified by conducting the questionnaire survey with pre-and-post tests .The mean score improved from the pre-workshop mean of 3.5 correct answers out of 10 questions to post-workshop mean of 6.7 correct answers (2-tailed paired *t*-test $p<0.001$). See result in Table-1. About 86% of participants rated workshop as 'Good' or above.

**Table-1: Pre- and Post-Test Scores**

| | Pre-test Score Mean±SD | Post test score Mean±SD | Mean Difference | *p*- value* |
|---|---|---|---|---|
| **Score of test** | 3.5±1.6 | 6.7±1.5 | 3.19±1.6 | <0.001 |

**Paired t-test*

## DISCUSSION

A hands-on workshop can improve skills in data analysis in SPSS for research papers. We recommend more workshops to train clinicians and basic science researcher in data analysis techniques using SPSS to interpret their data results in their research projects .The recommendations and suggestions by workshop participants included increasing the length of the workshop. However, 86 percent of participants were satisfied with the format and teaching methodology imparted in the workshops.

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