

Original Research Article

An experience of workshop on introduction to statistical methods and SPSS hands-on training to enhance analytical skills among research professionals

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ABSTRACT

Background: In a current scenario, research project and writing a thesis is one of the most important components of PG and Ph.D. studies and a potential area where the students are challenged by lack of structured guidance. Thus the workshop on “Introduction to Statistical Methods & ‘SPSS’ Hands-on Training” was conducted with the objectives, to know the impact of workshop and to obtain suggestions for improvement.

Methods: The workshop on “Introduction to Statistical Methods & ‘SPSS’ Hands-on Training” conducted during 7-9 November, 2016 by the Department of Community Medicine, Shri B. M. Patil Medical College, Hospital and Research Centre in collaboration with University of Manitoba, Canada. The effectiveness of the workshop was assessed by pre-and-post tests using Multiple-Choice Questions (MCQ). Analysis was done using paired t test and Wilcoxon signed rank test.

Results: A total of thirty six participants attended the sessions. The overall participant opinion about the workshop was positive. Majority of the participants were female. Majority of the participants were in the age group of 30-35 years (33%), followed by 25-30 years (28%). Majority of participants were MBBS (31%), MD (28%), other degree faculty members (22%) and PhD (22%). The mean score in pre-and-post-test was 12.52 ± 6.17 and 13.98 ± 6.50 respectively (Range=2-27) and was found significant difference in the scores between pre-and-post-tests ($p=0.002$).

Conclusions: The recommendations and suggestions given by workshop participants were to increase the duration of the workshop. Participants were satisfied with the teaching methodology in the workshops.

Keywords: SPSS, Data analysis, Workshop, Hands-on

INTRODUCTION

“Statistical thinking will one day be as necessary a qualification for efficient citizenship as the ability to read and write” by H.G. WELLS. Person involved in research should always keep in mind that science is a search for the truth and thus there is no room for bias or inaccuracy in statistical analyses or their interpretation.¹

We use statistics to analyze data, make predictions, and make comparisons to find similarities and differences and to draw conclusions. A postgraduate (PG) student should compulsorily take a research study as per university norms and should submit dissertation.² In a current scenario, research project and writing a thesis is one of the most important components of PG and Ph.D studies and a potential area where the students are challenged by lack of structured guidance. The academic demands of writing

a thesis, research paper require students to use their education in new and challenging ways to produce something extraordinary. The most difficult elements of writing a thesis include framing a research hypothesis, identifying study samples, collecting the data and using appropriate statistical tools and data analysis for drawing conclusions.

It's the first time, workshop on "Introduction to Statistical Methods and 'SPSS' Hands-on Training" conducted in our university. There are user- friendly software available for data analysis like SPSS(Statistical package for the Social Sciences), EPI Info which are relatively easy to use, and there are user-unfriendly like STATA, SAS, and RAV Man.³ Among these SPSS is one which is easy to understand and most commonly used. So our goal is to educate participants in applying statistical tool for data analysis and enable them to achieve complete knowledge in the area of 'SPSS'. We wanted to know the level of skills acquired after attending this workshop.

We conducted workshop over 3 days, which covered basic, intermediate and advanced levels of statistical methods. We also covered all aspects of the software training using hand-on practice sessions. The objectives of the study:

- a) To know the impact of workshop.
- b) To obtain suggestions for improvement, to conduct upcoming workshop on need basis of researchers.

METHODS

The workshop on "Introduction to Statistical Methods & 'SPSS' Hands-on Training" conducted during 7-9 November, 2016 by the Department of Community Medicine, Shri B. M. Patil Medical College, Hospital & Research Centre in collaboration with University of Manitoba, Canada. This workshop had 11 sessions of 45 minutes each with an interactive session and 4 sessions of 90 minutes on SPSS. At the beginning of each session, the resource person concerned gave a brief overview of the topic in less than 10 minutes. It was ensured that the lecture was lively one with frequent questions and clarifications. The majority of participants were from Shri B. M. Patil Medical College, Hospital and Research Centre, Vijayapura and others from Akka Mahadevi Women's University, Gulbarga University, and also from MBA, and degree colleges from different places.

Five faculties supervised these sessions of total 36 participants who were made into 6 batches of 6 students each, using 30 computer stations with high-speed Internet connectivity and SPSS software in Academic Council Hall, BLDE University. Pre-and-post tests were conducted to assess the effectiveness of the workshop as they reveal statistically significant gain in knowledge. These tests also checked the competency level of knowledge about statistical methods and data analysis in

SPSS.⁴ Maximum time given for pre test was 20 min. The participants were given multiple-choice questions (MCQ). The participants were expected to write his/her age, gender, educational status, institute and his/her designation in the proforma. At the end of the workshop, all participants were given post-test questionnaire with same time of 20 minutes. The results of pre and post test were analyzed using SPSS version 16.

A separate feedback form for evaluation was given to rate the sessions of the workshop from a scale of 1-4, with 1- very useful, 2- useful, 3- satisfactory, 4- not useful. The participants were expected to mark the ratings. In the evaluation form overall organization of workshop, time management, arrangement of food, venue, and audiovisual aids were also assessed with the ratings of satisfactory and non satisfactory. The participants were also instructed to write general feedback on the workshop with suggestions for the improvement of the workshop.

Statistical methods

In order to facilitate the unbiased feedback, the participants were instructed not to enter their identification details like name, department etc., in the evaluation form. The data was entered into MS excel software and later analyzed using the software SPSS 16 version. The differences in the mean scores of pre-test and post-test were analyzed using paired t test. Wilcoxon signed rank test was used as the initial test for statistical significance between the pretest and post test scores.⁵

RESULTS

A total of thirty six participants attended the sessions. Majority of the participants were female 64% and 36% were males. Majority of the participants were in the age group of 30-35 years (33%), followed by 25-30 years (28%) which is shown in fig 1. Majority of participants were MBBS (31%), MD (28%), other degree faculty members (22%) and PhD (22%), who participated in this workshop to enhance their data analysis skills. The number of participants is shown in Figure 2.

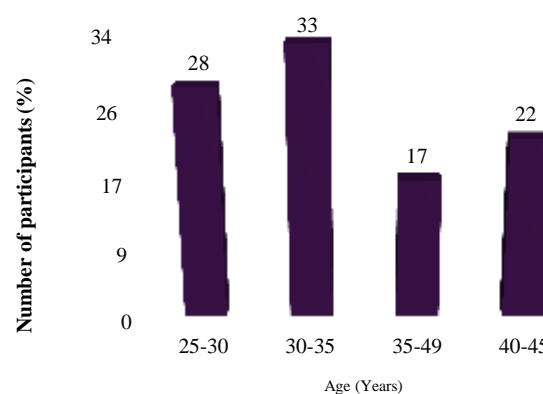


Figure 1: Distribution of participants according to age (%).

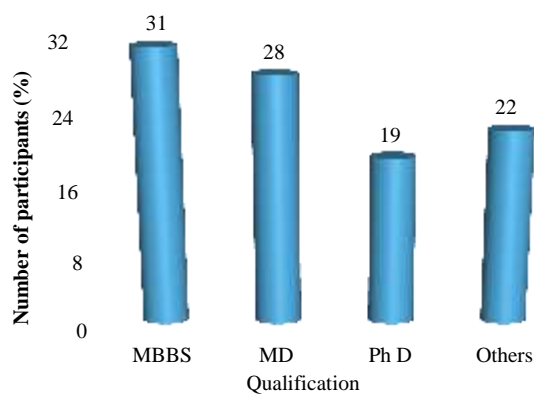


Figure 2: Distribution of participants according to qualification (%).

Understanding of data analysis skill was identified by conducting pre-and-post test. The scores obtained for each question were added to obtain the total pre-and-post test scores, respectively. The mean pre test score was 12.52, while the mean post test score was 13.98. The median pre-and-post test scores were 12.5 and 13.5 respectively.

Wilcoxon signed rank test was used as the initial test for statistical significance between the pre-and -post test scores. The mean score of 12.52±6.17 in pre-test improved to 13.98±6.50 in post-test (range=2-27). It was found significant difference in the scores between pre and posttests (p=0.002). From this, we can say that the workshop has significantly improved the awareness level. The results of the test are presented in Table 1.

Table 1: Shows the correct answers given by the participants in pre test and post test.

Correct answers given	N	Minimum	Maximum	Mean	SD	Median	Wilcoxon Signed Rank's test, p value
Pre Correct	36	2.00	27.00	12.52	6.17	12.5	Z= -3.051
Post Correct	36	2.00	27.00	13.98	6.50	13.5	p=0.002*

(* significant at p<0.005)

Table 2 : Shows overall ratings of the workshop.

Overall Ratings	Satisfactory n (%)	Non Satisfactory n (%)
Organization of workshop	25 (69.4)	11 (30.5)
Time management	29 (80.5)	7 (19.4)
Food	29 (80.5)	7 (19.4)
Arrangements of food, venue and audiovisual aids	27 (75)	9 (25)

Table 2 shows overall ratings of organization of workshop, time management, arrangement of food, venue and audiovisual aids, with the ratings of satisfactory and non-satisfactory which are shown in Table 2.

DISCUSSION

The workshop on “Introduction to Statistical Methods & ‘SPSS’ Hands-on Training” was conducted for the first time by Department of Community Medicine, Shri B. M. Patil Medical College, Hospital & Research Centre in collaboration with University of Manitoba, Canada. The present study was carried out to know the impact of workshop and to obtain suggestions for improvement, to conduct upcoming workshop on need basis of researchers.

The results indicate that there was a statistically significant improvement in knowledge between the pre-test and the post-test. An evaluation study of research methodology workshop held at Tirupati by Prabhu et al found significant improvement where mean score of pre-test was 3.42 and post-test was 10.53.² In another study by Rahim et al showed mean scores of pre-test and post-

test were improved from 3.5 to 6.7 respectively, whereas in our study mean pre-test score of 12.52 was improved significantly to 13.98 at the end of the workshop.³ The difference between mean pre-and-post test score is less in our study, as most of the participants were graduate and post graduates and already involved in research.

The sessions were rated in the evaluation form, where most sessions were graded as ‘very useful’, while a few sessions rated ‘useful’ grade which was found similar by Prabhu GR et al², where it was found that, all sessions were rated as good and very few as excellent.

In the evaluation form overall ratings organization of workshop, time management, arrangement of food, venue, and audiovisual aids were also assessed with the ratings as satisfactory and non satisfactory. We observed that 69.4% were satisfied with organization of workshop, 80.5% were satisfied with time management, similarly 80.5% were satisfied with food provided at the workshop followed by 75% being satisfied with overall arrangements. In the study by Rahim et al, 86% of participants said overall arrangements of workshop as satisfactory and good which is also similar to our study.³

The limitation of the study is many of the SPSS hands-on workshop have been conducted by many institutes, but very less number of articles have been published, so more references were not available. And as it was hands-on workshop, number of participants were limited.

CONCLUSION

The recommendations and suggestions given by workshop participants were to increase the duration of the workshop. Participants were satisfied with the teaching methodology in the workshop. We recommend hands-on workshops to train clinicians and basic science researcher in data analysis techniques using SPSS to interpret their data results in their research projects.

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