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SPSS SOFTWARE IN ORTHODONTICS – A REVIEW

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SPSS SOFTWARE IN ORTHODONTICS - A REVIEW

ABSTRACT
SPSS is a set of software programs that are combined together in a single package. It aims at analyzing scientific data related with social science and can handle large sets of variable data formats. This software can be utilized for orthodontic research to contemplate results in a less complicated manner. It helps in analyzing and better understanding of data and solve complex research problems through a user friendly interface. The advanced statistical procedures help in ensuring high accuracy and quality decision making.

KEYWORDS: SPSS software, research, biostatistics

1. INTRODUCTION

SPSS (Statistical Package for the Social Sciences) was introduced by Nie, Bent and Hull in 1968 and the software was later acquired by IBM on 28th July 2009 for 1.2 billion dollars. Since then , the software has been upgraded with currently active version of 26.0 (as of 9th April 2019). The software can be run on operating systems like Windows, MacOS, Linux and Unix and has a size of 1.2 GB. They have a website link to download the software : Website reference : www.ibm.com/products/spss-statistics

2. USES

The software can be used in various fields like market research, healthcare research, government activities, survey companies, education research, etc. It is basically a software that is concerned at simplifying the research data by decoding complex formulas and saving them so that the output of the research can be quantified easily.

3. FEATURES AND BENEFITS

Its features and benefits ranges from small to large enterprises
For small and medium enterprises (SME):
They provide a technique for cleaning unprocessed data, allows access to date in relational databases.
For large scale enterprises (LSE):
It acts as a real time processing and online mapping of date, allows import and export if different medium like Excel, SAS and assess validations.

4. STRENGTHS AND LIMITATIONS

Like any other software programs, SPSS has its own strengths and limitiations. Advantages includes that it is a simplified version of a complex statistical test, there is no requirement to remember complex formula, the date collected can b easily and quickly displayed in the form of tables, and the software can be expanded by syntax feature or purchasing add-ins as and when required. Demerits of the software is that they can be expensive, requires additional training to maximize utilizing the features and the graphic features are not as simple as Excel.

5. HOW TO START

Like any other program used in the computer, this software can be chosen after clicking on the "Start" menu and then opt for "SPSS software". The file we create gets saved in ".sav" format. This document once opened allows us to input the data that we have collected for our research purpose. It has various options to analyse data and give the result. The most important step in utilizing this software lies in our knowledge to understand how to fit in the data that we have obtained. Once the data has been added, analysis of date can be carried out through various options like frequency table, descriptive analysis, etc..

BASIC MENU OPTIONS

Like other softwares like Excel, Menus in SPSS include File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Extensions, Windows, Help

FILE option : Some commonly used options include

New : create a new file – can be opened as Data (allows feeding in the data), Syntax, Output (to read the results) mode

Open : open an existing file

Import data : from other programs

Close / Save/ Save As option

EDIT option : some commonly used options include

Undo / Redo / Cut/ Copy/ Paste/ Clear/ Insert Variable/ insert Cases/ Find/ Replace/ Go to Case/ Go to Variable

VIEW option : allows to activate/ deactivate status bar and other toolbars, change fonts, gridlines, see variables, etc.

DATA menu : This allows to define variable, properties, dates, sorting cases, sorting variables, merge and split files and select cases.

TRANSFORM MENU : It allows to create new variables using compute variables, helps changing variables through recode, rank cases, etc., create time series, date and time wizard, replace missing numbers

ANALYZE MENU : This option allows to process the data that has been entered. Options available are in the form of reports, descriptive statistics, compare means, general linear model, generalized linear model, mixed models, correlate, regression, loginear, classify, Dimension reduction, Scale, No parametric test, Forecasting, Survival, Multiple response, Simulation, Quality Control, ROC Curve

GRAPH MENU : It helps to create chart designs like bar chart, pie chart, histogram, scatter plot, etc.

UTILITIES MENU : It allows you to define variable sets, use variable sets and other options that are not used frequently.

ADD-ONS : They are programs that can be added to the base SPSS package. These are additional features for special requirements and meant for advanced level users. Options include forecasting, advanced statistics, decision trees.

WINDOWS MENU : It allows you to select in which window you want to work (Data Editor/ Output Editor/ Syntax)

HELP MENU : It provides link for SPSS homepage, statistical coach, syntax guide, type a keyword and view categories and subcategories and is used to troubleshoot most problems.

6. HOW TO INPUT DATA MANUALLY

Illustrating with an example, consider a question " How many children around 10 -13 years have Class II malocclusion with impacted maxillary canine but are not undergoing any form of orthodontic treatment?". If this is the hypothesis proposed for an area with screening performed in a school. We would obtain around 1600 results. Interpreting such large data manually will tend to be a cumbersome process. If the data we get are simultaneously entered in the software, the calculation and interpretation of results would be simplified.

TO EXAMINE	OPTIONS GIVEN
GENDER	MALE/ FEMALE
AGE	10-11/ 11-12/ 12-13
NOT UNDERGOING TREATMENT	YES/ NO
CLASS II MALOCCLUSION	YES/ NO
IMPACTED CANINE	YES / NO

When the data obtained is small, both data view and variable view can be edited manually. Thus the data entry is possible without syntax. When the data is Large as in case of Statistical Surveys, the data is entered through a software with a computer assisted personal interviewing (either in the form of optical mark recognition, direct capture from online questionnaire) and the datasets are finally read into the SPSS software.

7. METHOD OF ENTERING DATA MANUALLY

STEP 1 : Choose Variable view and type the basic columns that you will prefer in your final outcome.The row represents the parameters that you want in your output and the column represents the code according to which the software will give the final tabular column. For example, name is composed of letters, so it can be chosen with the type "String", it will not have any width or decimal as the length of the name will vary. The Label for display in final output will be "name" and it has no numeric value. In case of Gender, it can be either male or female. Thus The type will be Numeric, Width can be 2 (As value is assigned as 1: male, 2 : female). It has not decimal as there are only 2 possible options and it can be labelled as "Gender".

NAME	TYPE	WIDTH	DECIMAL	LABEL	VALUE
ID	Numeric	2	0	ID	NONE
NAME	String	2		NAME	NONE
GENDER	N	2	0	GENDER	1:MALE, 2:FEMALE
AGE	N	3		AGE	1:(10-11), 2:(11-12), 3:(12-13)
CLASS II MALOCCLUSION	N	2	0	MEDICATION	1:YES, 2:NO
IMPACTED MAX CANINE	N	2	0	CARIES	1:YES, 2:NO
NOT UNDERGOING TREATMENT	N	2	0	MISSING	1:YES, 2:NO

DATA VIEW

STEP 2 : Once the data has been entered in the Variable view, the data gets reflected like the below picture in the "Data View" option.

ID	NAME	GENDER	AGE	CLASS II MALOCCLUSION	IMPACTED MAXILLARY CANINE	NOT UNDERGOING TREATMENT
1	Ajay	1	1	1	1	1
2	Banu	2	2	1	2	2
3	Divya	2	3	2	2	2
4	Elizabeth	2	3	1	2	2
5	Farah	2	1	2	1	1
6	Gavin	1	2	2	2	1

8. STATISTICAL ANALYSIS OPTION (USING FEW PARAMETERS):

Thus, the data once collected is organized and classified and this SPSS software is used to solve a problem using statistical analysis. Following this, a conclusion or solution to the problem can be formulated.

Statistical Analysis Options that are available include:

Reports, Descriptive Statistics, Compare Means, General Linear Model, Generalized Linear Model, Mixed Models, Correlate, Regression, Loglinear, Classify, Data Reduction, Scale, Non parametric test, Time series, Survival, Multiple response, Quality Control, ROC curve

Some of the commonly used Statistical Analysis include Descriptive Statistics, Compare means, Correlation Analysis, Regression Analysis. Descriptive Statistics can be represented in the form of Bar diagram, Pie Chart, Frequency table, Histogram, Scattered plot, Cross table. To compare means, t-test independent sample, t-test paired sample, one way ANOVA, etc. Regression test include linear, logistic, ordinal scales.

Few articles to quote where the software was used :

1. Nasal cavity volume changes after rapid maxillary expansion in adolescents with 3-dimensional simulation and modelling programs, study by Serkan et Al[2] , AJODO 2010, has utilized this software to perform paired sample t test to compare pretreatment and posttreatment nasal cavity volume and

maxillary areas. The data analysis was performed using SPSS for Windows (version 15.00; SPSS, Chicago, III)

9. DATA PROCESSING BY SPSS

The data can be read and written from ASCII, spreadsheets and databases. The file format for saving ".spv". This can be exported to text or MS Word, PDF Excel or graphic image formats (JPEG, PNG, BMP AND EMF)

TYPE	EXTENSION	CONTENT
Data set	.sav	Data and variables
Syntax	.sps	Commands and comments
Output	.spv	Results

VARIATIONS AND VERSIONS IN SPSS software:

It includes SPSS Statistics Gradpacks, SPSS with client/ server architecture and is available as monthly, annual subscription license.

10. CONCLUSION:

SPSS software is used to analyse scientific data and provides a better understanding of the data and solves complex problems through a guided use of the software.

11. REFERENCES:

[1] SPSS SOFTWARE guide : Almquist_Ashir_Brannstroem_Guide_1.0.1
[2] Görgülü S, Gokce SM, Olmez H, Sagdic D, Ors F. Nasal cavity volume changes after rapid maxillary expansion in adolescents evaluated with 3-dimensional simulation and modeling programs. American journal of orthodontics and dentofacial orthopedics. 2011 Nov 1;140(5):633-40.

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