

RESEARCH SCHOLARS AND USES OF STATISTICAL TOOLS

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ABSTRACT

At present, researchers need to know statistical tools. Statistics is the branch under which we can systematically collect, classify, and tabulate the data collected for research work. By analyzing these data, a definite conclusion can be reached through proper interpretation. Data and facts used without statistical concepts are like a dead body. If the facts are expressed through appropriate classification and reasoning, they start showing self-evident results. It is necessary not only to analyze the facts and figures but also to draw definite conclusions from the research topic and increase the research's importance. When statistical software is used along with theoretical knowledge of these statistical concepts, it helps us know the results related to facts and figures quickly. In statistics, it is possible to analyze numerical and qualitative facts. Therefore, statistics is important for all fields of research. In the presented research paper, the students' knowledge regarding the concepts of statistics, their ideas regarding statistical tools, their knowledge about various statistical concepts, and their tendency to use statistical software have been studied. Primary data has been collected to know the trend related to the improvements using statistical tools. In the presented research paper, data has been collected from researchers of different subjects from different universities. The objective of the presented paper is to study the tendency of reformers regarding their statistics. Also, the information related to their statistics tool is to analyze various statistical concepts, related knowledge and facts related to the use of statistics tools. Along with this, to know the problems related to the use of statistical tools and various software and to present suggestions to solve them. To do research work successfully, along with knowing statistical concepts, it is also necessary to know statistical software.

KEYWORDS: *Statistical Tool's, Reliability, Central Tendency, Hypothesis Test, Statistical Software.*

Introduction

First of all, researchers find out the research problem. After this, we study literature related to research. After preparing our methodology related to research, we collect the data. It is necessary to first organize this data properly, put it in table form, and analyze it properly so that we can reach a definite conclusion. And statistical software is used to organize the collected data in less time and analyze it properly.

- **Statistical Tools:** The most well-known Statistical tools are the mean, the arithmetical average of numbers, median, and mode, Range, dispersion, standard deviation, inter-quartile range, and coefficient of variation.
- **Statistical Software:** Statistical software is a type of software in which we can easily use statistics tools through which we can do different statistical calculations in a very short time and accurately. Through these statistics tools, not only we can do statistical calculations but through them, we can also create tables and graphs.

In the presented research paper, the students' knowledge regarding the concepts of statistics, their ideas regarding statistical tools, their knowledge about various statistical concepts, and their tendency to use statistical software have been studied.

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Review of Literature

Ali Z, et., al. (2016) studied "Basic Statistical Tools in Research and Data Analysis" and found that statistical methods are used in the planning, designing, data collection, analysis, meaningful interpretation, and reporting phases of a study and when statistical techniques are misused, they can produce incorrect conclusions, errors, and undermine the article's significance. Inadequate data can result in substandard research, and research can lead to unethical behaviour. Therefore, having a solid understanding of statistics and knowing when to apply different statistical tests are crucial. Proficiency in fundamental statistical techniques can significantly enhance research designs and generate high-caliber medical research, which can be employed in the development of evidence-based guidelines.

HR, G. and Aithal, P. S. (2022) explained how important statistics are to doctorate-level research and analysis and samples, examining the relationships between variables and found that scholars have to well know the difference between measures of central tendency and dispersion, they also know how to measure correlation, test of hypotheses, type I and type II errors and scholars will be able to choose appropriate statistical techniques across various steps of the research process and comfortably claim their research findings.

Begum K. and Ahmed A. (2015) Discuss the Importance of Statistical Tools in Research Work and suggest that in research and dissertations for different types of fields, it is necessary to have knowledge of different types of statistical tools like - "mean, median, mode, t-test, "F-test", and regression analysis. Also, for research, One must have the skill to select an appropriate statistical tool that produces good findings.

Agrawal S (2021) studies the use of Statistics in Research and suggests that understanding statistics enables you to gather data correctly, carry out precise analysis, and effectively communicate the findings. The process of making decisions, predictions, and scientific discoveries based on data is heavily influenced by statistics. You can gain a deeper understanding of a subject by using statistics. Accurate results are typically produced by analysts who apply statistical procedures correctly.

Winters, R., et., al. (2010) studied Statistics and analyzed that Comprehending the precise methodology of every statistical test is not imperative; however, grasping specific concepts like parametric and non-parametric tests, correlation, and numerical versus categorical data is. You will be able to identify clear anomalies in the statistics with the help of this working knowledge.

Objectives

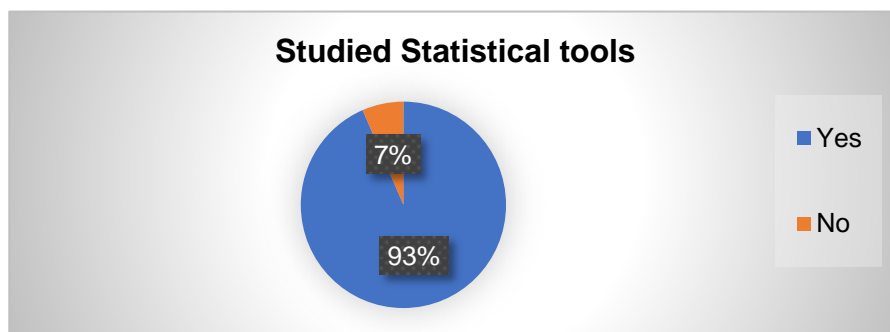
- To study the views of research scholars regarding statistical tools.
- To study the knowledge level of researchers regarding statistical tools.
- To study the trend of using different statistical software.
- To present suggestions regarding the use of statistical tools and statistical software.

Research Methodology

This is an analytical paper where primary data are taken to get definite results. Primary data has been collected to know the trend related to the improvements using statistical tools. In the presented research paper, data has been collected from researchers of different subjects from different universities.

Analysis

The following facts were analyzed after collecting the data:



For the research, data was collected from researchers from various universities and research institutions, which revealed that 93% of researchers have studied statistical tools, while 7% of the Researchers have not studied statistical tools.

Where and how to use these statistical tools?				
		Percent	Valid Percent	Cumulative Percent
Valid	Know Completely	19.4	19.4	19.4
	Know well	48.4	48.4	67.7
	Know a little	32.3	32.3	100.0
	Total	100.0	100.0	

From the above table, it is known what are the researchers' views on where and how to use the statistical tools. 19.4% of researchers completely Know where and how to use statistical tools. 48.4% of researchers Know well, and 32.3% Know a little about where and how to use the statistical tools.

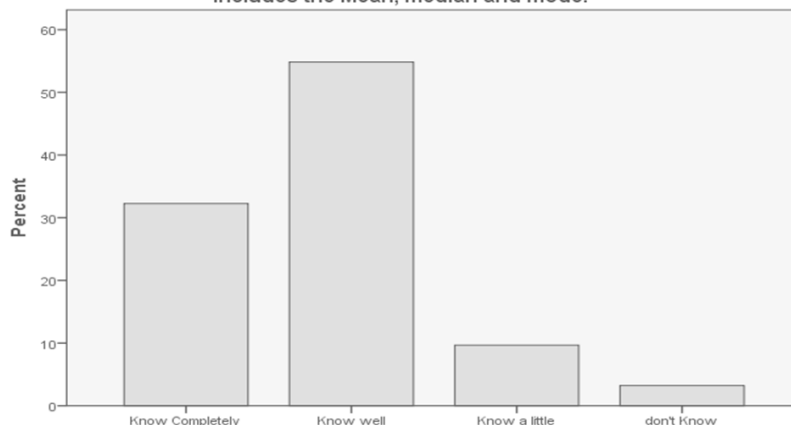
whether statistics tools are necessary for your research topic?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	99	41.9	41.9	41.9
	Agree	98	41.9	41.9	83.9
	Neutral	8	12.9	12.9	96.8
	Disagree	2	3.2	3.2	100.0
	Total	211	100.0	100.0	

From the above table, it is known whether researchers consider the use of statistical tools necessary for their research topic or not. 84% of researchers here believe that it is necessary to use statistical tools for their research, and they agree and strongly agree with the use of statistical tools in research. 13% of researchers are neutral on this topic. There are 3% of researchers who disagree on this subject.

Statistical tools make our research accurate, reliable and important.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	101	45.2	45.2	45.2
	Agree	103	45.3	45.2	90.3
	Neutral	5	6.5	6.5	96.8
	Disagree	2	3.2	3.2	100.0
	Total	211	100.0	100.0	

From the above table, we come to know that researchers consider the results obtained in their research using statistical tools as accurate, reliable and important. Almost 90% of researchers believe that using statistical tools makes their research findings accurate, reliable and important.

As a research scholar you know where and how to use Central Tendency, which includes the Mean, median and mode.

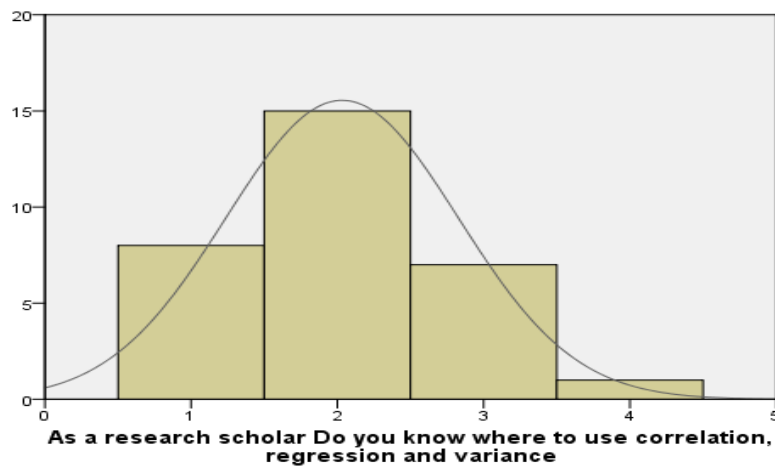


As a research scholar you know where and how to use Central Tendency, which includes the Mean, median and mode.

Almost 3-10 % of researchers don't know and know a little about central tendency, which means where and how to use Mean Median and mode. The remaining 87% of researchers know very well how and where central tendency should be used.

As a research scholar Do you know where to use correlation, regression, and variance?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Know Completely	55	25.8	25.8	25.8
	Know well	101	48.4	48.4	74.2
	Know a little	34	22.6	22.6	96.8
	don't Know	21	3.2	3.2	100.0
	Total	211	100.0	100.0	

Almost 3- 25 % of researchers don't know and know a little about Correlation, regression, and variance. The remaining 74 % of researchers know very well how and where Correlation, regression, and variance should be used.



About various tests conducted in statistics like F test Z test and t test					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Know Completely	40	19.4	19.4	19.4
	Know well	94	45.2	45.2	64.5
	Know a little	67	32.3	32.3	96.8
	don't Know	10	3.2	3.2	100.0
	Total	211	100.0	100.0	

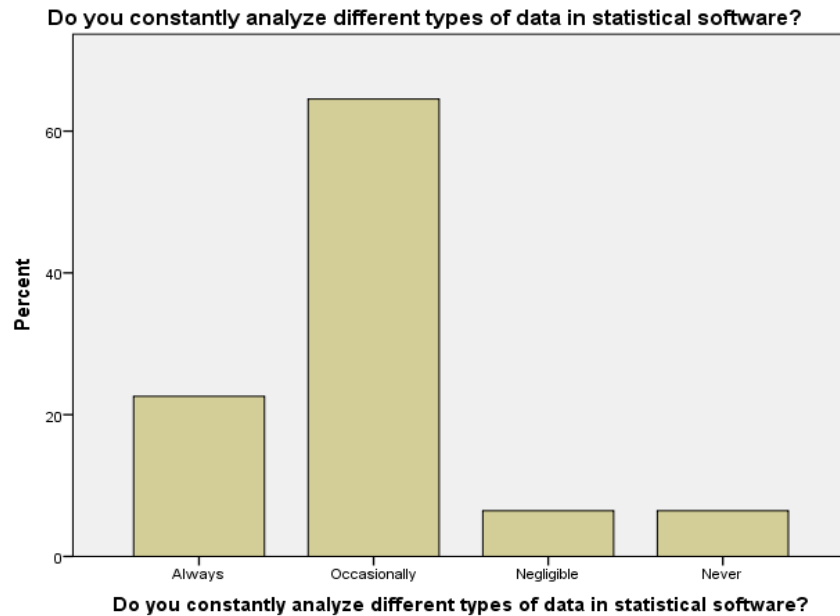
Does your computer/ laptop have statistical software? like SPSS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	170	80.6	80.6	80.6
	No	41	19.4	19.4	100.0
	Total	211	100.0	100.0	

Almost 80% of research scholars have Statistical software in their system (desktop, laptop etc.)

Which statistical software do you know how to use?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SPSS	94	45.2	45.2	45.2
	MS Excel	73	35.5	35.5	80.6
	smart PLS	22	9.7	9.7	90.3
	others	22	9.7	9.7	100.0
	Total	211	100.0	100.0	

More than 90% of research scholars use SPSS for statistical analysis. Apart from this, MS Excel, smart PLS and other statistical software are used for analysis.

What do you think about the use of SPSS?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Know Completely	13	6.5	6.5	6.5
	Know well	128	61.3	61.3	67.7
	Know a little	48	22.6	22.6	90.3
	don't Know	22	9.7	9.7	100.0
Total		211	100.0	100.0	



The above diagram shows that most research scholars use statistical software occasionally. Almost 25% of researchers use always statistical software for their data analysis. And almost 10-15% of researchers do not use statistical software.

Importance of using Statistical Tools & and Software in Research

Another where statistical tools help us to reach definite results from the data collected for research. On the other hand, statistical software gives us correct results by analyzing large amounts of data in very little time and without any error.

Suggestions

Some important suggestions are being given so that researchers related to all subjects will not only know statistics tools but will also know how to use statistics tools related to their subject and make their analysis and research more effective.

- Researchers should be presented with such examples related to their subject so that they can learn to use statistics tools.
- Researchers should be provided with real research examples where they can learn to use different statistical tools such as measures of central tendency, correlation regression, and various types of tests.
- Researchers should not only be explained the process of making and testing hypotheses but should also be shown how to conduct experiments in reality.
- All researchers should be associated with computer technology so that they have basic knowledge of computers and statistical analysis.
- Make sure that all the researchers have all the statistical software on their computers and laptops or they open them in their system and learn to do the analysis.

- Researchers should understand in detail the methods of inputting and analyzing data into statistical software.
- Along with this, the results obtained from the analysis are also explained, how to draw correct conclusions and how to write them in your thesis. Explain the methods of how to write it in your conclusion.

Conclusion

From the above analysis, it is known that some subject-related researchers do not know the statistics tool. Neither do they know how to use it nor do they consider it important for their research, whereas statistics tools are useful not only for numerical but also for qualitative data and some researchers use statistical software very little. Two reasons can be considered for this. Firstly, they do not contain much information related to statistics tools. I do not use statistical software consistently. Therefore, the suggestions given in this paper must be followed by all the research centres and universities where research work is done.

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