

Original Research Article

Effect of Statistics Anxiety on MBBS Students' Statistics Knowledge Achievement

Nand Kishore Singh^{1*}, Jag Mohan Dhakar²¹Associate Professor, Dept Com.Med, SHKMGM Nalhar, Nuh, Haryana, India²Stician-cum Tutor, Dept Com.Med, NSCBMC Jabalpur, M P, India

Received: 15-06-2021 / Revised: 17-07-2021 / Accepted: 11-08-2021

Abstract

In this paper the effect of Statistics anxiety on the MBBS students Statistics achievement knowledge. The present study was descriptive (survey type) in its nature and quantitative by approach. A sample of 300 students was drawn using purposive sampling technique by online survey method. Pearson product-moment correlation coefficient (r) and simple linear regression were used as inferential statistics to analyze the data. A moderate inverse correlation was investigated between Statistics anxiety and MBBS students "knowledge achievement. Through simple linear regression, 40% variation was noted due to Statistics anxiety in MBBS students' knowledge achievement.

Keywords: Achievement knowledge score, Statistics anxiety, MBBS students

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Statistics anxiety is a condition of nervousness, fear, tension, or uneasiness created when learners perform statistics/Bio-Statistics operations. Statistics anxiety is considered as one of the major issues among pedagogues (educationist), and it negatively affects students' learning and their knowledge achievement. Statistics anxiety is referred to as a sensation of nervousness and tension which interferes with the manipulation of numbers to solve statistics sums. Statistics anxiety is a state of fear and helplessness which an individual faces when he is asked to perform certain statistics/biostatistics operations. Statistics anxiety is a painful sensation of fear or tension which hinders and reduces students' Statistics achievement knowledge and has two factors i.e. cognitive and emotional. [1,2] The cognitive factors involve apprehensions of a student's performance, mistrust, lack of confidence, and negative attitude and sentimental elements include uneasiness, nervousness, fear, dread, and distress during working with Data/numbers. [3] Statistics anxiety affects "Statistics achievement knowledge through the cognitive interference experienced by the students. Therefore, students" find it hard to retrieve concepts which they have already memorized or learned. They are incapable of giving accurate answers or solutions of statistics problems in the exams. This cycle leads learners to restrict their engagement in Statistics courses that further limits their knowledge achievement. [4]

Objectives

1. To find out the relationship between Statistics anxiety and MBBS students' achievement knowledge in Statistics;
2. To determine the effect of Statistics anxiety on MBBS students' achievement knowledge in Statistics.

*Correspondence

Dr. Nand Kishore Singh

Associate Professor, Department of Dept. Community Medicine, SHKMGM Nalhar, Nuh, Haryana, India.

E-Mail: nksingh946@gmail.com

Methods

Study Design-Descriptive study

Sampling Methods

Purposive sampling

Study Area-Medical College

Study Population

MBBS Students

Study Tool-Semi Structured question by online survey

Sample Size

$Z^2PQ/e^2 = 3.84 \times 40 \times 50 / 5 \times 5 = 307.2$ ---- 300

Research Questions

Consistent with the objectives, the study was driven by following research questions:

1. Is there any relationship between Statistics anxiety and students' achievement in Statistics?
2. Is there any effect of Statistics anxiety on students' achievement knowledge in Statistics?

The research instrument Statistics Self-Efficacy and Anxiety Questionnaire (SSEAQ) developed and was adapted to measure the level of Statistics anxiety. [5] SSEAQ has two subscales including self-efficacy (SE) and Statistics anxiety (SA), [6] however, only one subscale "SA" was taken to measure students' level of SA. [7] A questionnaire having 14 items regarding SA was taken from the SSEAQ on a five point Likert type rating scale (1 = Never to 5 = Always). The magnitude of Cronbach's Alpha was 0.72.

Data Analysis Techniques-Pearson product-moment coefficient of correlation (r) and simple linear regression were used to analyze the results of the research from the sample.

Findings-Research Question 1: Is there any relationship between Statistics anxiety and students' knowledge achievement?

Pearson's r correlation coefficient was applied to explore relationship between SA and students' knowledge achievement.

Table 1: Relationship between Statistics Anxiety and Students' Achievement in Statistics

| Variables | N | r | P* |
|--|-----|------|------|
| Statistics Anxiety & Students' Knowledge Achievement | 300 | -.66 | .001 |

* $p < .001$, $df = 27$

The Pearson product-moment coefficient of correlation (r) was used to explore the relationship between Statistics anxiety and students' achievement in Statistics. The above table demonstrates a moderate negative relationship between Statistics' anxiety and students' knowledge achievement; $r(298) = -.66$, $p < .001$. Therefore, it was found that there is a statistically significant negative relationship between Statistics anxiety and students' Statistics achievement knowledge.

Table 2: Descriptive Statistics on Statistics Anxiety and Students' Knowledge Achievement

| Variables | N | M | SD |
|-------------------------------------|-----|-------|--------|
| Statistics Anxiety | 300 | 2.177 | .7698 |
| Students' Achievement in Statistics | 300 | 45.62 | 14.042 |

Table 3: Regression Model Summary Regarding the Effect of Statistics Anxiety on Students' Achievement in Statistics

| R | R-Square | Adjusted R-Square | Std. Error of the Estimate | df | F | P* |
|------|----------|-------------------|----------------------------|----|--------|------|
| .551 | .320 | .354 | 13.271 | 1 | 143.21 | .000 |

*P<.001

Table 3 shows that there is a highly significant effect of Statistics anxiety on students' achievement knowledge in Statistics.

Table 4: Regression Coefficients of Statistics Anxiety and Students' Achievement knowledge in Statistics

| Model | Unstandardized Coefficients | Standardized Coefficients | | |
|--------------------------------|-----------------------------|---------------------------|--------|------|
| Achievement Score instatistics | β^{\wedge} | Std. Error | T | P |
| | 68.61 | 2.054 | 33.93 | .000 |
| Anxiety | -10.5 | .866 | -11.03 | .000 |

*p<.001

Results

To investigate the level of the effect of Statistics anxiety on students' achievement knowledge in Statistics, simple linear regression statistical technique was used. The results of Tables show that the value of predictive utility of MBBS students' knowledge achievement in Statistics, is the magnitudes of R-square = .66, adjusted R-square = .354, & $F=143.21$ with $df=1$, which all are highly significant at $p<0.001$. The magnitude of R-square = .320 indicates that there is a variation of 40% in MBBS students' Statistics knowledge achievement being accounted for by the variations in Statistics anxiety. Table 4 informs regarding non-standardized coefficients for Statistics anxiety and score on achievement in Statistics. Statistics anxiety $\beta^{\wedge} = -10.5$, $t = -11.03$ at $p<.001$ was found to be highly significant to MBBS students knowledge achievement in Statistics. Therefore, it was concluded from the above result that Statistics anxiety had a significant effect on Statistics knowledge achievement score of MBBS students. Also, the value of standardized beta (Beta) reflects a moderate negative relationship between predictor and criterion variables. The coefficient for Statistics anxiety is -10.5 (see Table 4). So for every unit increase in statistics anxiety, a -10.5 unit decrease in Statistics achievement score is predicted, holding all other variables constant. Also, the effect of Statistics anxiety on students' knowledge achievement can be determined through the prediction equation, which is described as: $Y = a + bX$

Where Y stands for achievement score which is dependent variable, X represents Statistics anxiety which is an independent variable, „a” is intercept (constant) and „b” is the slope of regression line.

If mean Statistics anxiety is 2.177 (see Table 2), then Statistics achievement score of the student can be calculated through simple linear regression equation. Here, the magnitude of Intercept is 68.61, and the slope is -10.5. Therefore, the achievement score in Statistics of the students were calculated as:

Achievement Score = $68.61 - 10.5$ (Statistics Anxiety Mean Score)

in Statistics

= $68.61 - 10.5(2.177)$

= $68.61 - 22.8585$

= 45.7515

Conclusion

Therefore, it can be concluded from the above calculations that achievement score in Statistics of students becomes 45.7515 on average. This score is highly significant at $p<.001$ (Table 4).

A significant moderate negative relationship was found between Statistics anxiety and MBBS students' knowledge achievement in Statistics.

References

1. Cemen, P. B. (1987). The nature of mathe anxiety (Report No. SE048689). Stillwater, OK: Oklahoma State University (ERIC Document Reproduction Service No. ED287729).
2. Furner, J. M., & Berman, B. T. Confidence in their ability to do Statistics: The need to eradicate math anxiety so our future students can successfully compete in a high-tech globally competitive world. *Philosophy of Statistics Education Journal*. 2004;18(1):1-33.
3. Hardfield, O. D., Martin, J. V., & Wooden, S. mathe anxiety and learning style of Navajo Middle School student. *School Science and Statistics*, 1992; 92(4): 121-176.
4. Morris, L. W., Davis, M. A., & Hutchings, C. H.. Cognitive and emotional components of anxiety: Literature review and a revised worry-emotionality scale. *Journal of Educational Psychology*, 1981; 73:541-555.
5. Preis, C., & Biggs, B. T. Can instructors help learners overcome math anxiety? *Australian Teacher Education Association Journal*, 2001;28: 6-10.
6. Puteh, M. (2002). Qualitative research approach towards factors associated with Statistics anxiety. *Proceeding of the 3rd International Statistics Education and Society Conference, (MESC" 02)*, Centre of Research in Learning Statistics, Copenhagen, pp. 1-5.
7. Ashcraft, M. H. Mathe anxiety: Personal, educational, and cognitive consequences. *Current Directions in Psychological Science*, 2002;11(5): 181-185.

Conflict of Interest: Nil Source of support: Nil