

**EFFECT OF SKY PRACTICES ON WELLNESS AND
PERFORMANCE OF STUDENTS IN HIGHER EDUCATION**

*Thesis submitted to Bharathiar University, in partial fulfillment
of the requirements for the award of the degree of*

**DOCTOR OF PHILOSOPHY
IN
YOGA FOR HUMAN EXCELLENCE**



Submitted by

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CHAPTER V

ANALYSIS AND INTERPRETATION OF DATA

5.0 INTRODUCTION

The study design used for the research is a type of quasi-experimental design to assess the effect of SKY practices on the wellness and academic performance of students in higher education. Wellness was measured with the identified dimensions for physical, mental, and social aspects. The assessments were carried out in three periods - Pre, Mid and Post for all the students of the sample group. The sample group was organized into two study groups - High Academic Performers and Low Academic Performers based on their academic performance in the first year. Both the groups underwent the SKY yoga training and practised for three years. Pre-assessment was carried out prior to the start of first year. This is the starting point for measuring the variables under investigation, such as dimensions of physical, mental, and social wellbeing for both the groups. Mid-assessment was carried out prior to start of second year. Post-assessment was carried out prior to start of third year. The data collected during these time periods were used to investigate the changes observed in the variations within each group and variations between the groups.

The criteria for inclusion in the study group are:

- Age of the students in the range of 15-20 years.
- In the study group of 98 students, top 15% on the basis of first year marks were classified as 'High academic performers' and bottom 15% as 'Low academic performers'.
- Students physically capable of participating in a yoga-based intervention.
- Students willing and able to commit themselves for yoga intervention and data collection during entire duration of the study.

The criteria used for exclusion to the study group include:

- Students with ailments such as cardiovascular disease, severe mental disorders, or any other condition that could interfere with their ability to safely practise yoga.

- Students who underwent major surgery within a certain timeframe prior to the study, such as within the past six months.
- Students taking certain medications that could potentially interfere with cognitive function or physical ability to perform yoga.

Fortunately, no student was found to have such limitations, and everyone was included in the study group.

The measurements of wellness and academic performance collected during three time periods were used for statistical analysis.

5.1 ANALYSIS

In this study, data analysis was conducted using R and JASP statistical software. The data were represented as mean and standard deviation (M [SD]). To analyze the data, a two-way mixed ANOVA was employed. Longitudinal study was carried out with periods - Pre, Mid, and Post within and between the groups (High Academic performers vs Low Academic performers). The data's normality was confirmed using the Shapiro-Wilk test, sphericity was verified with Mauchly's test (applying the Greenhouse-Geisser correction if necessary), and the homogeneity of variances and covariances were ensured using Levene's test and Box's test, respectively.

5.2 RESULTS

The data from analysis are presented in table with graphical formats for academic performance and each domain of the wellness dimension. The mean scores and standard deviations are presented in tables for High academic performers and Low academic performers in the Pre, Mid and Post periods. Graphs were prepared with two-way mixed ANOVA, results for academic performance and wellness dimensions in three parts.

- The first part is line graph indicating the scores of the High academic performers and Low academic performers over time - Pre, Mid and Post.
- The second part is the bar graph of the scores of High academic performers and Low academic performers over time – Pre, Mid and Post.
- The third part is the independent bar graph of the scores of High academic performers and Low academic performers.

Four levels of significance are marked on the graphs both within and between the study groups over three periods Pre, Mid and Post. Level of significance at ($p < 0.05$) is marked with single star *, ($p < 0.01$) is marked with two stars **, ($p < 0.001$) is marked with three stars***. ($p < 0.0001$) is marked with ****.

5.2.1 ACADEMIC PERFORMANCE:

The following Table – 5.1 shows the mean and standard deviation of academic performance of High and Low academic performers during three time periods Pre, Mid and Post.

TABLE – 5.1
MEAN SCORES AND STANDARD DEVIATION OF ACADEMIC
PERFORMANCE

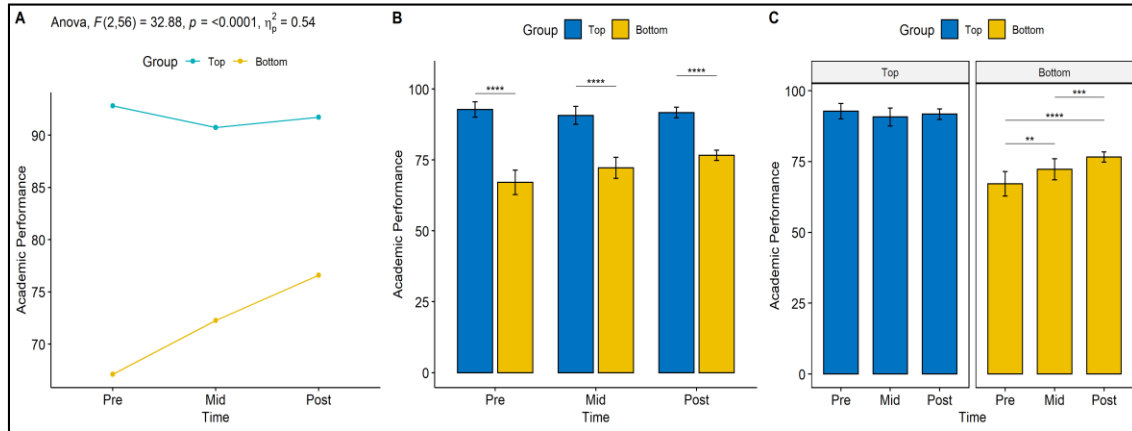
	Pre		Mid		Post	
Variables	M (%)	SD	M (%)	SD	M (%)	SD
High academic performers	92.80	2.70	90.73	3.15	91.73	1.83
Low academic performers	67.13	4.32	72.27	3.71	76.60	1.80

The mean academic score of High performers remained consistently high i.e. above 90%. The mean academic score of Low performers increased from 67.13% to 76.60% and their standard deviation decreased from 4.32 to 1.80 during the Pre and Post periods of study. However, the High performer's standard deviation was 1.83 during Post period.

The Figure – 5.1. shows the line and bar graphs of Academic scores of High and Low performers over three periods Pre, Mid and Post.

FIGURE – 5.1

**ACADEMIC PERFORMANCE OF HIGH AND LOW PERFORMERS
PRE, MID, POST**



The first, line graph shows the sustained academic score of High performers and increasing trend of the Low performers during Pre, Mid and Post periods. The second, bar graph indicates that the High performers maintained significantly higher score than the Low performers during Pre, Mid and Post periods ($p < 0.001$). The third bar graph shows the longitudinal study of High and Low performing groups indicating that the Low performers improved their performance significantly from Pre to Mid ($p < 0.01$), Mid to Post ($p < 0.001$) and Pre to Post ($p < 0.0001$) periods.

5.2.2 PHYSICAL WELLNESS

From literature survey, five dimensions of physical wellness were identified. Due to feasibility of measurement, only BMI was measured aspart of physical wellness for the study group.

5.2.2.1 BODY MASS INDEX

Table – 5.2 shows the mean and standard deviation of Body Mass Index of High and Low academic performers during three periods Pre, Mid and Post.

TABLE – 5.2

MEAN SCORES AND STANDARD DEVIATION OF BODY MASS INDEX (BMI)

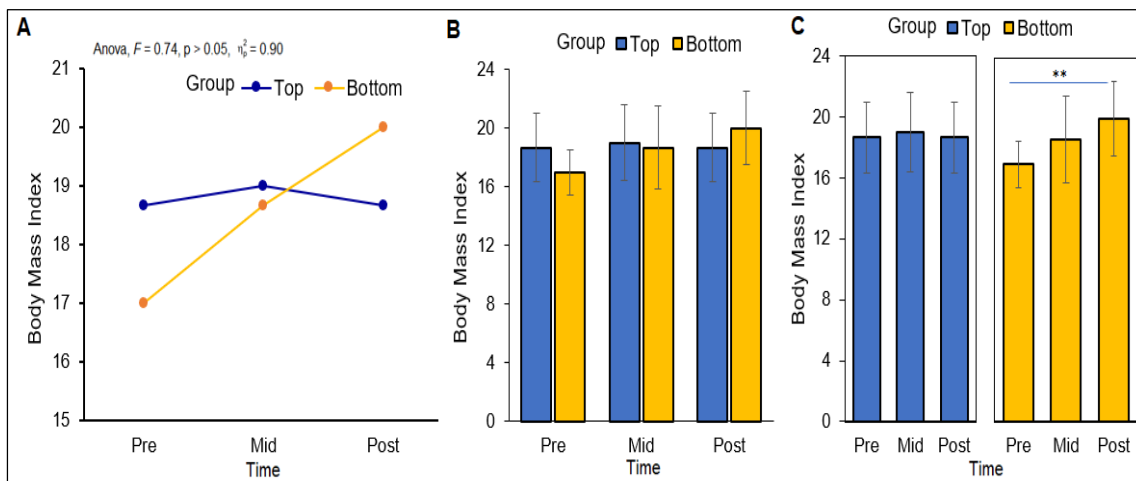
	Pre		Mid		Post	
Variables	M	SD	M	SD	M	SD
High academic performers	18.67	2.35	19.00	2.59	18.67	2.32
Low academic performers	17.00	1.56	18.67	2.85	20.00	2.48

The High performers maintained their high scores of 18.67 during Pre and Post periods. The Low performers increased their BMI score from 17.00 to 18.67 and to 20.00 during Pre, Mid to Post periods.

Figure – 5.2 shows the line and bar graphs of Body Mass Index of High and Low performers over three periods Pre, Mid and Post.

FIGURE – 5.2

BMI SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The line graph indicates the steady improvement of BMI for the Low performers while High performers have maintained their score. The second, bar graphs show the same trend for the Low performers. The third, bar graph indicates that the Low performers improved their BMI score significantly Pre to Post period ($p < 0.01$).

5.2.3 MENTAL WELLNESS

Three dimensions of mental wellbeing considered for the study group are Attention, Executive function, and Memory. For each dimension, multiple tools were used for assessment as described below.

5.2.3.1 ATTENTION

Attention was measured using three tools - Digit letter substitution test (DLST), Six letter cancellation task (SLCT), Digit vigilance test (DVT). Table – 5.3 shows the mean and standard deviation of DLST, SLCT and DVT scores of High and Low academic performers during three periods Pre, Mid and Post.

TABLE – 5.3
MEAN SCORES AND STANDARD DEVIATION OF ATTENTION

	Pre		Mid		Post	
Variables	M	SD	M	SD	M	SD
DLST Score						
High academic performers	64.67	13.36	59.33	8.36	72.93	9.53
Low academic performers	58.73	7.40	57.13	9.02	65.20	10.11
SLCT Score						
High academic performers	44.67	12.48	46.40	9.39	47.20	11.58
Low academic performers	33.80	7.64	43.87	12.24	39.73	10.10
DVT Score						
High academic performers	88.13	13.07	78.20	14.05	79.13	7.50
Low academic performers	89.60	42.81	82.73	12.91	70.60	12.55

The mean score of DLST of High performers improved from 64.67 to 72.93 during Pre and Post periods and that of Low performers improved from 58.7 to 65.2 during corresponding period. The mean score of SLCT of High performers improved from

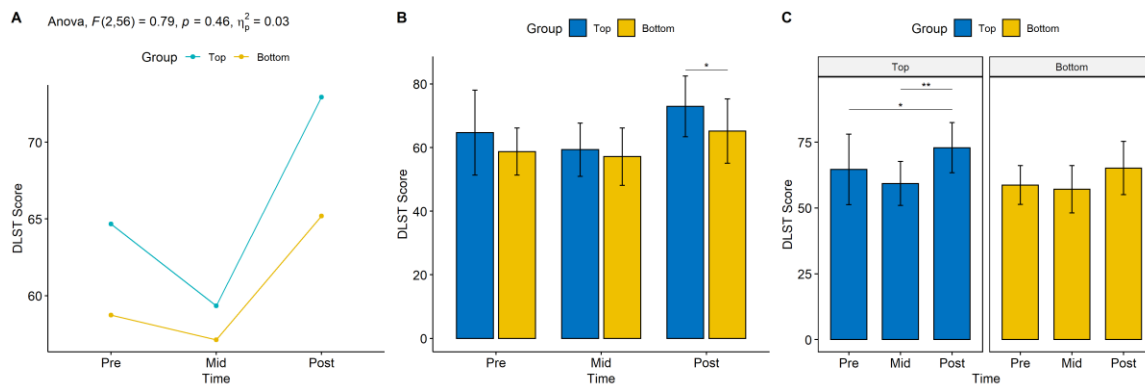
44. 67 to 47.2 and Low performers from 33.80 to 39.73 during Pre and Post periods. Lower scores indicate better performance for DVT, as the score represents the time taken to complete the task. Both the groups showed improvement in the mean score of DVT during Pre to Post periods – High performers from 88.13 to 79.13, Low performers from 89.60 to 70.60.

Figures – 5.3 a, 5.3 b, 5.3 c show the line and bar graphs of DLST, SLCT and DVT scores of High and Low performers over periods Pre, Mid and Post.

DLST score

FIGURE – 5.3 a

DLST SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

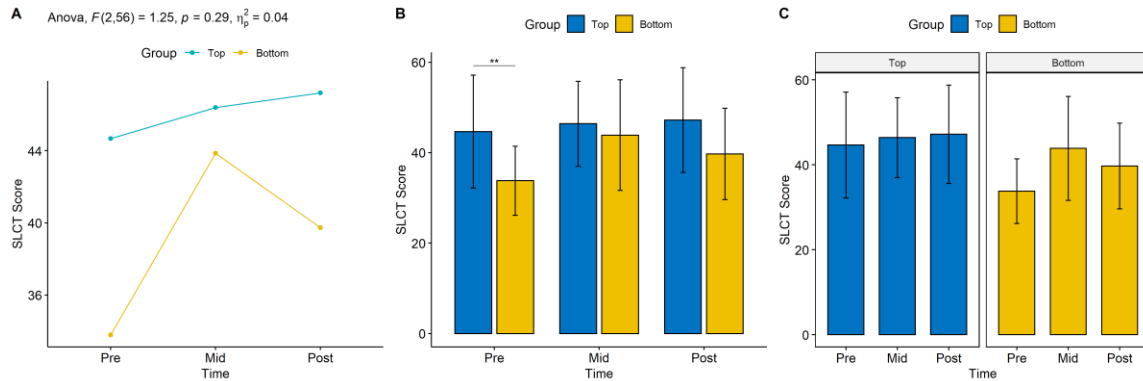


The first, line graph shows that both High and Low performers, improved their mean DLST scores during Pre to Post periods with a drop during Mid period. The second, bar graph indicate that the during Post period, the mean DLST score of High performers is significantly better than the Low performers ($p < 0.05$). The third, bar graph shows that the High performers have improved their mean DLST scores significantly during Pre to Post period ($p < 0.05$) and Mid to Post period ($p < 0.01$).

SLCT score

FIGURE – 5.3 b

SLCT SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

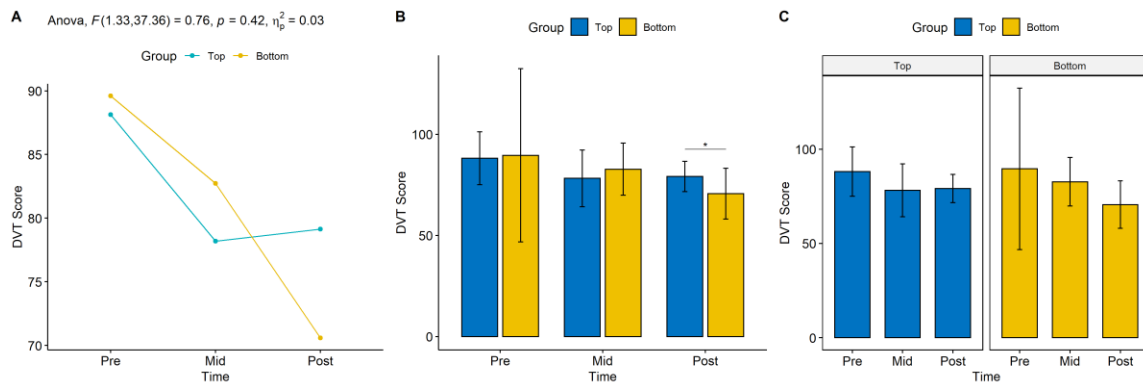


The first, line graph shows that both High and Low performers improved their SLCT scores from Pre to Post period, the Low performers dropped part of the improvement made during Mid period. The second, bar graph indicates that the High performers' score is significantly high compared with Low performers during Pre ($p < 0.01$) period.

DVT score

FIGURE – 5.3 c

DVT SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



In the DVT, lower scores indicate better performance, as the score represents the time taken to complete the task. Therefore, a decrease in scores over time suggests an improvement in sustained attention. The first, line graph shows that both High and Low

performers improved their mean DVT score from Pre to Post periods. The second, bar graph indicate that the Low performers' score is significantly better compared with High performers during Post ($p < 0.05$) period.

5.2.3.2 EXECUTIVE FUNCTION

Table – 5.4 shows the mean scores and standard deviation measured using three assessment tools Word Stroop Test, Color Stroop Test, and Word Color Stroop test and SMT test during Pre, Mid and Post periods for High Performing students, and Low performing students.

TABLE – 5.4

MEAN SCORES AND STANDARD DEVIATION OF EXECUTIVE FUNCTION

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
Word Stroop Test						
High academic performers	101.93	12.71	114.47	19.71	121.27	21.28
Low academic performers	95.47	11.58	100.80	14.90	108.60	11.94
Color Stroop Test						
High academic performers	72.67	9.68	81.73	19.15	86.67	16.74
Low academic performers	67.33	5.75	70.93	5.86	77.47	10.66
Word Color Stroop Test						
High academic performers	47.73	6.94	59.00	16.12	63.33	16.56
Low academic performers	37.87	10.97	44.47	14.23	52.60	11.24
SMT Score						
High academic performers	57.00	12.21	60.00	8.70	66.93	5.69
Low academic performers	51.13	7.49	58.20	10.44	59.73	12.75

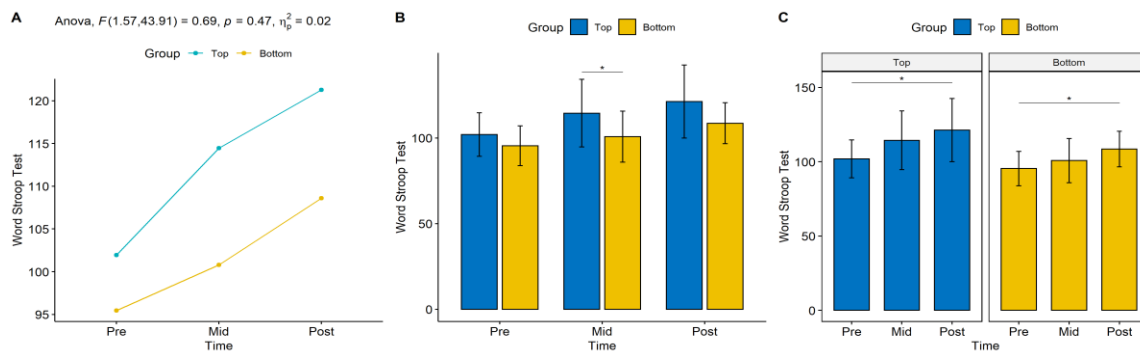
On the Word Stroop test, both the groups have improved their scores consistently from Pre to Post with High performers from 101.93 to 121.27 and Low performers from 95.47 to 108.60. The standard deviation of the Low performers is lower at 11.94 compared with 21.28 for High performers during Post period. On the Color Stroop test, both have improved their score consistently with High performers from 72.67 to 86.67 and Low performers from 67.33 to 77.47. The standard deviation of Low performer was lower at 10.66 compared with High performers at 16.74 during Post period. On the Word Color Stroop test, both the groups improved their scores consistently with High performers from 47.73 to 63.33 and Low performers 37.87 to 52.6. The standard deviation of Low performers was low at 11.24 compared with High performers at 16.56 during Post period. On the SMT score, both the groups made improvement consistently from Pre to Post with High performers from 57.00 to 66.93 and Low performers from 51.13 to 59.73.

The Figure – 5.4 a, 5.4 b, 5.4 c, 5.4 d show the line and bar graphs of Word Stroop Test, Color Stroop test, Word Color Stroop test, SMT scores of High and Low performers over three time periods Pre, Mid and Post.

Word Stroop

FIGURE – 5.4 a

WORD STROOP TEST OF HIGH AND LOW PERFORMERS PRE, MID, POST

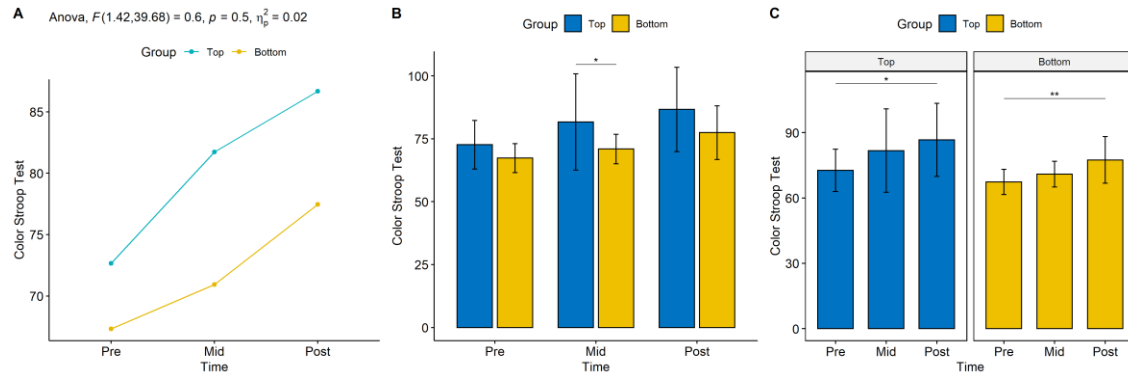


The first, line graph shows that both the groups have improved Word Stroop test score consistently from Pre to Mid and to Post periods. The second, bar graph indicates that the High performers' score is significantly better compared with Low performers during Mid ($p < 0.05$) period. The third, bar graph shows that both the groups have significantly improved their score during Pre to Post periods ($p < 0.05$).

Color Stroop

FIGURE – 5.4 b

COLOR STROOP TEST OF HIGH AND LOW PERFORMERS PRE, MID, POST

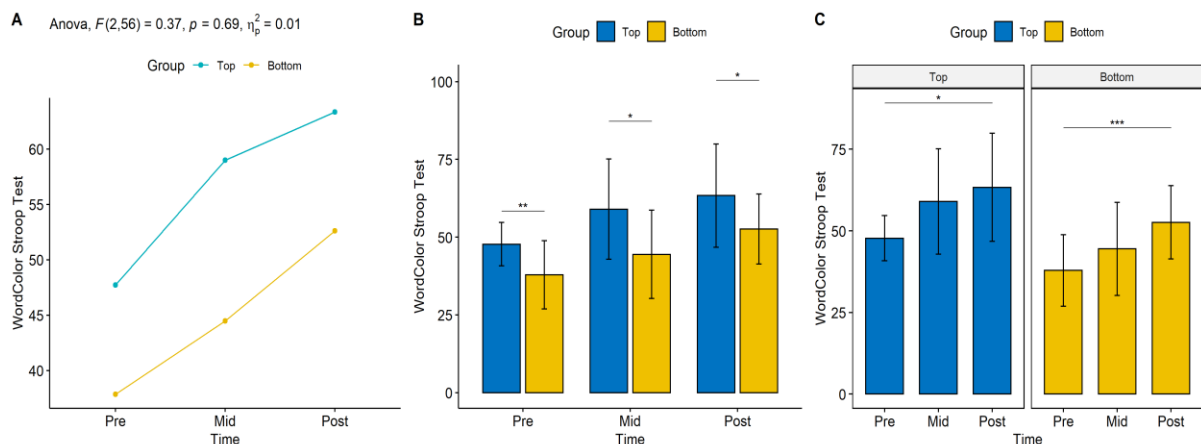


The first, line graph shows that both the groups have improved their Color Stroop test scores consistently from Pre to Mid and to Post periods. The second, bar graph indicates that the High performers' score is significantly better compared with Low performers during Mid ($p < 0.05$) period. The third, bar graph shows that both High performers ($p < 0.05$) and Low performers ($p < 0.01$) have significantly improved their score during Pre to Post periods.

Word Color Stroop

FIGURE – 5.4 c

WORD COLOR STROOP TEST OF HIGH AND LOW PERFORMERS PRE, MID, POST

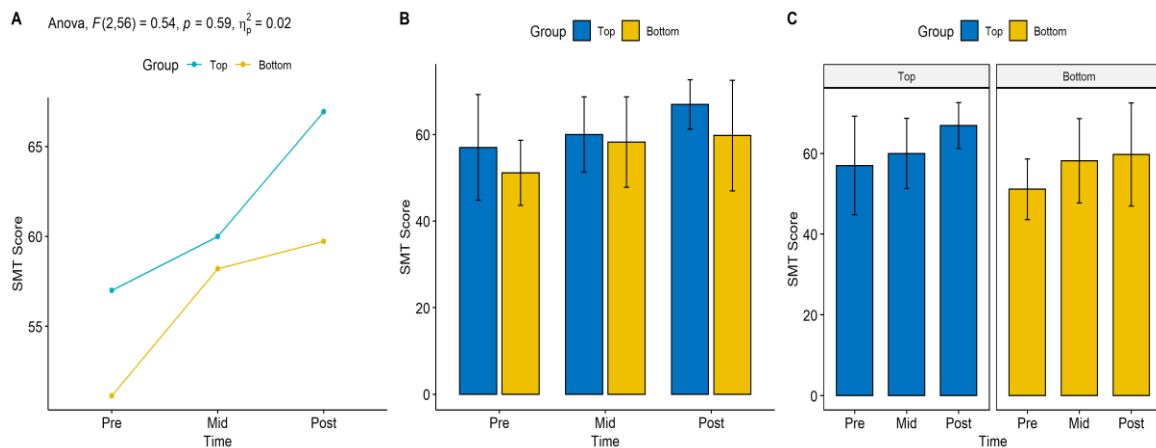


The first, line graph shows that both the groups have improved their Word Color Stroop test scores consistently from Pre to Mid and to Post periods. The second, bar graph indicates that the High performers' score is significantly better than Low performers during Pre ($p < 0.01$), Mid ($p < 0.05$) and Post ($p < 0.05$) periods. The third, bar graph shows that both High performers ($p < 0.05$) and Low performers ($p < 0.001$) have significantly improved their score during Pre to Post periods.

SMT score

FIGURE – 5.4 d

SMT SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The first, line graph shows that both the groups have improved their scores consistently from Pre to Mid and to Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Mid and Post periods.

5.2.3.3 MEMORY

Table – 5.5 shows the mean scores and standard deviation measured using two assessment tools Digit forward and Digit backward tests during Pre, Mid and Post periods for High Performing students, and Low performing students.

TABLE – 5.5

MEAN SCORES AND STANDARD DEVIATION OF MEMORY

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
Digit Forward (Short-term memory span)						
High academic performers	9.40	1.76	9.73	1.87	9.53	1.64
Low academic performers	8.47	1.88	10.13	2.33	9.13	1.73
Digit Backward (working memory)						
High academic performers	7.27	2.58	8.07	1.91	7.60	2.53
Low academic performers	6.13	1.25	6.93	2.60	7.47	3.04

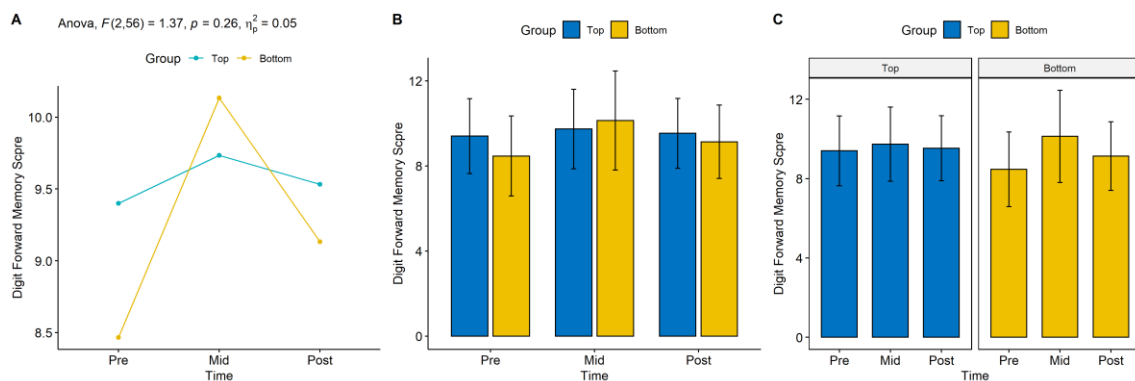
On the Digit forward test, both the groups have improved their scores from Pre to Post with High performers from 9.40 to 9.53 and Low performers from 8.47 to 9.13. On the Digit backward, both have improved their score with High performers from 7.27 to 7.60 and Low performers from 6.13 to 7.47.

Figures – 5.5 a, 5.5 b shows the line and bar graphs of Digit forward and Digit backward memory scores of High and Low performers over three periods Pre, Mid and Post.

Digit Forward memory

FIGURE – 5.5 a

**DIGIT FORWARD MEMORY SCORE OF HIGH AND LOW PERFORMERS
PRE, MID, POST**

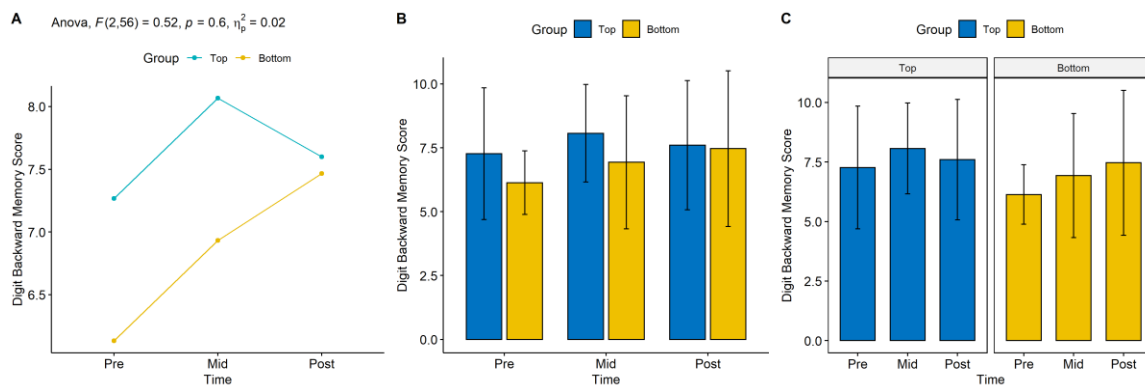


The first, line graph shows that both the groups have improved Digit forward memory scores from Pre to Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

Digit Backward memory

FIGURE – 5.5 b

DIGIT BACKWARD MEMORY SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The first, line graph shows that both the groups have improved Digit backward memory scores from Pre to Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

5.2.4 SOCIAL WELLNESS

Social wellness consists of dimensions – Emotional regulation, General health, wellbeing, Happiness, psychological wellbeing.

5.2.4.1 EMOTIONAL REGULATION

The Table – 5.6 shows the mean scores and standard deviation for Cognitive Emotion Regulation test with nine sub-scales: Self-blame, Acceptance, Rumination, Positive Refocusing (Postirefo), Refocus on Planning (Refou plan), Positive Reappraisal

(Posti_reapp), Putting into Perspective (Perspective), Catastrophizing (Castatro), and Other-blame measured during Pre, Mid and Post for High Performing and Low performing students.

TABLE – 5.6
MEAN SCORES AND STANDARD DEVIATION OF EMOTIONAL
REGULATION

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
CERQ Self-blame						
High academic performers	11.80	3.84	12.93	3.61	13.53	3.09
Low academic performers	13.47	3.23	11.73	3.65	11.53	2.45
CERQ Acceptance						
High academic performers	13.40	2.87	13.13	3.27	13.93	2.69
Low academic performers	13.27	2.63	12.47	4.07	13.53	2.03
CERQ Rumination						
High academic performers	12.33	2.79	13.73	2.96	14.53	2.64
Low academic performers	12.93	3.90	13.73	2.52	13.00	2.85
CERQ Positive refocusing						
High academic performers	13.13	3.16	13.80	3.12	14.13	2.95
Low academic performers	13.47	3.29	12.20	2.88	12.87	2.75
CERQ Refocusing plan						
High academic performers	16.60	3.18	15.33	3.42	17.73	1.79
Low academic performers	15.87	3.66	13.33	3.35	16.33	2.87

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
CERQ Positive reappraisal						
High academic performers	16.07	3.71	15.60	4.14	18.07	2.15
Low academic performers	16.47	2.72	13.33	3.90	15.53	2.53
CERQ Perspective						
High academic performers	10.07	2.66	11.60	3.46	11.47	3.46
Low academic performers	12.13	2.23	12.33	2.55	11.13	1.81
CERQ Catastrophizing						
High academic performers	10.20	4.33	10.80	3.41	10.13	4.00
Low academic performers	11.87	3.58	9.87	2.75	10.93	3.77
CERQ Other blame						
High academic performers	9.33	2.55	9.07	3.39	8.60	3.44
Low academic performers	9.73	3.94	11.20	3.38	8.80	3.38
CERQ Total						
High academic performers	112.93	18.30	116.00	19.15	122.13	14.78
Low academic performers	119.20	16.27	110.20	20.44	113.67	14.42

In the Self-blame subscale, the High performers showed a steady increase with 11.80, 12.93, 13.53 and Low performers showed a steady decrease with 13.47, 11.73, 11.53, respectively over Pre, Mid and Post periods. In the Acceptance subscale, both groups showed an increase in scores from the Pre to Post periods with High performers from 13.40 to 13.93 and Low performers from 13.27 to 13.53. In the Rumination subscale, the High performers showed a steady increase over Pre, Mid and Post periods with a score

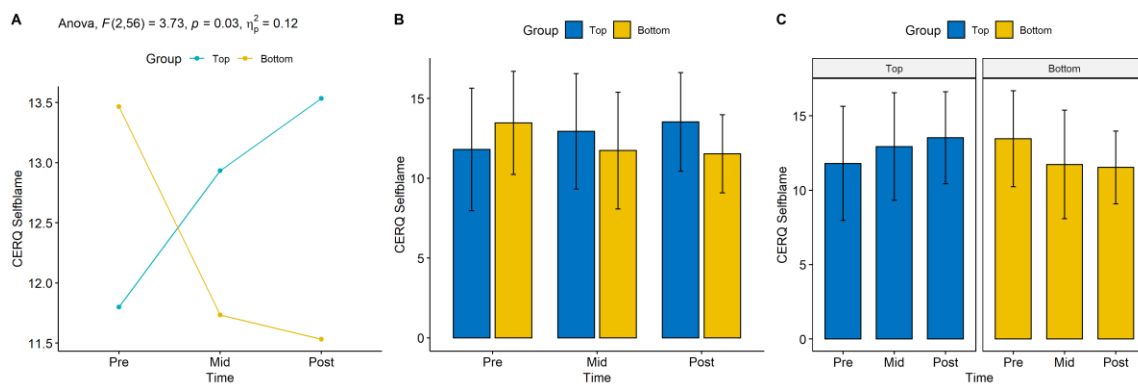
of 12.33, 13.73, 14.53, respectively. Low performers have showed an increase from Mid to Post and decrease from Mid to the Post periods. In the Positive Refocusing, Refocus on Planning, and Positive Reappraisal subscales, both groups generally showed an increase in scores over time. In the Perspective, Catastrophizing, and Other-blame subscales, the scores fluctuated for both groups.

The following Figures – 5.6 a - 5.6 j show the line and bar graphs of several variables of emotional regulation for High and Low performers over three time periods Pre, Mid and Post.

CERQ Self-blame

FIGURE – 5.6 a

CERQ SELF-BLAME SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

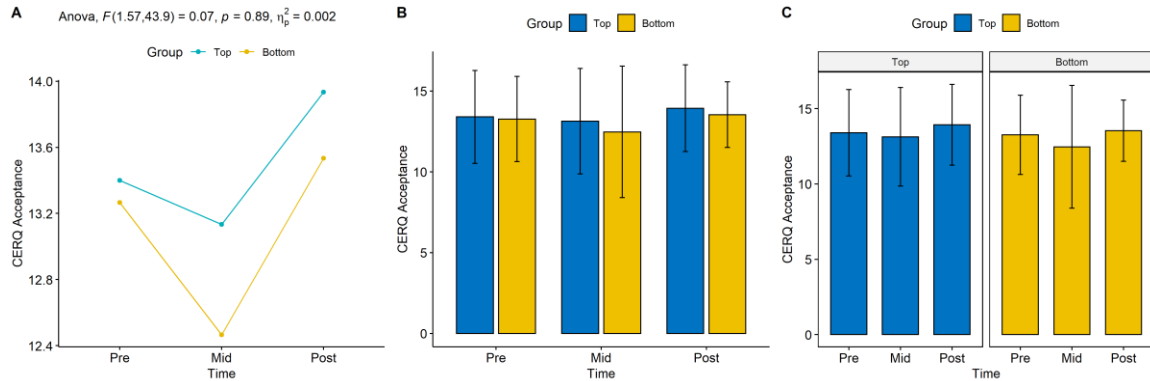


The first, line graph shows that the High performers showed a steady increase in Self-blame scores, suggesting an increase in the use of self-blame as a coping mechanism. Low performers showed a steady decrease over Pre, Mid and Post periods. The second, bar graph indicate that the High performers' score is higher than Low performers during Pre, Mid and Post periods. The third, bar graph shows steady increase in the scores of High performers and steady decline of Low performers.

CERQ Acceptance

FIGURE – 5.6 b

CERQ ACCEPTANCE SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

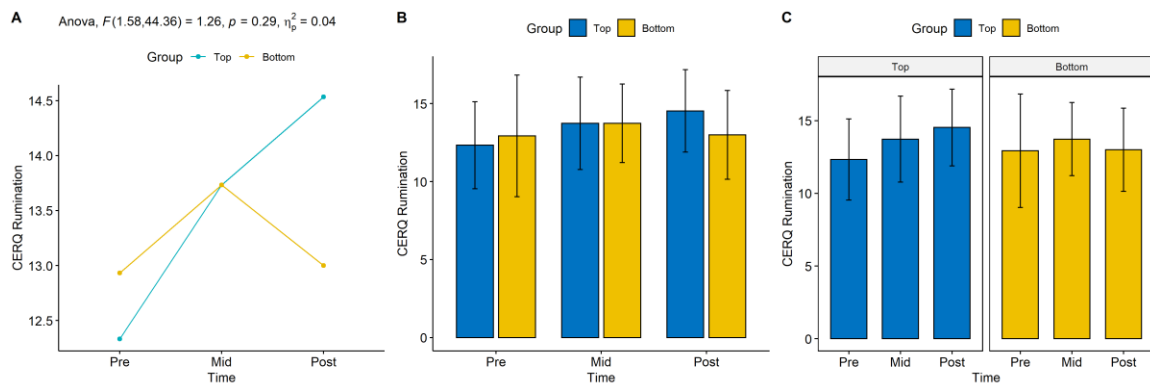


The first, line graph shows that both the groups have improved Acceptance scores from Pre to Post periods, suggesting an increase in the use of acceptance as a coping mechanism over their course of the study. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

CERQ Rumination

FIGURE – 5.6 c

CERQ RUMINATION SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

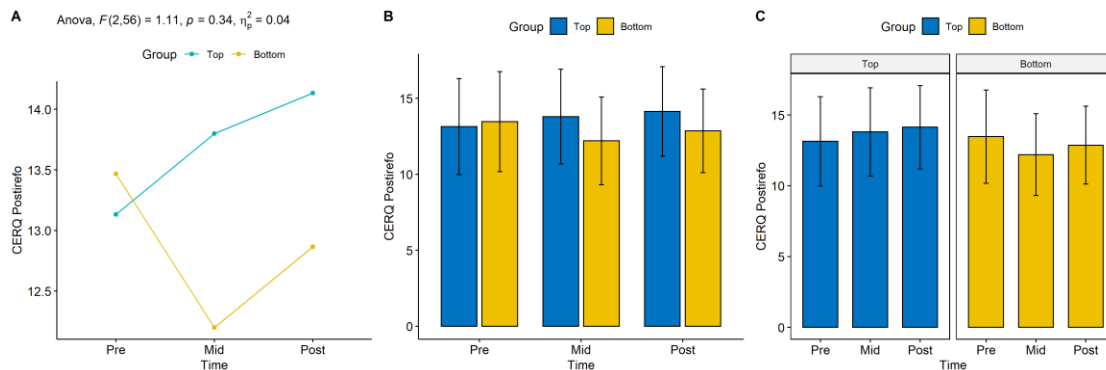


The first, line graph shows that High performers showed a steady increase in Rumination scores over time, suggesting an increase in the use of rumination as a coping mechanism. The second, bar graph indicate that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers made steady progress during Pre, Mid and Post periods and while the Low performers score was stagnant.

CERQ Positive Refocusing

FIGURE – 5.6 d

CERQ POSITIVE REFOCUSING SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

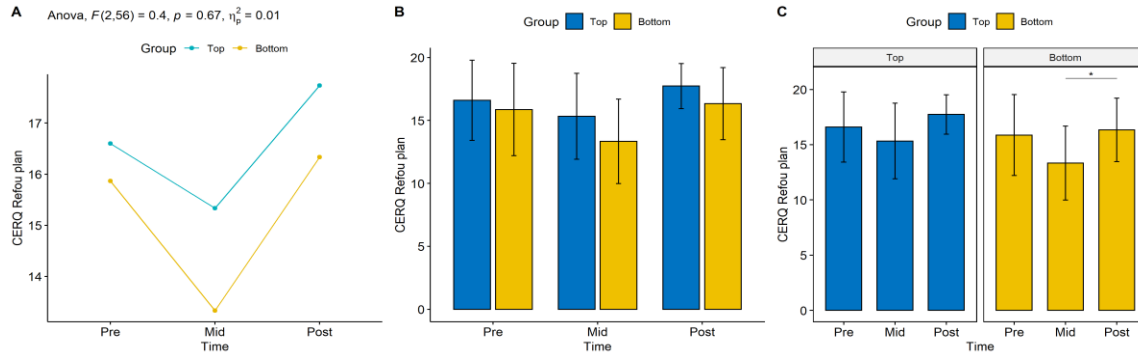


The first, line graph shows steady increase in High performers' Positive refocusing scores over Pre, Mid and Post periods, suggesting an increase in the use of the positive coping mechanisms over the course of the study and fluctuation in the scores of Low Performers. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows increase in the scores during Pre, Mid and Post periods, and fluctuation in the Low performers' scores.

CERQ Refocusing Plan

FIGURE – 5.6 e

CERQ REFOCUSING PLAN SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

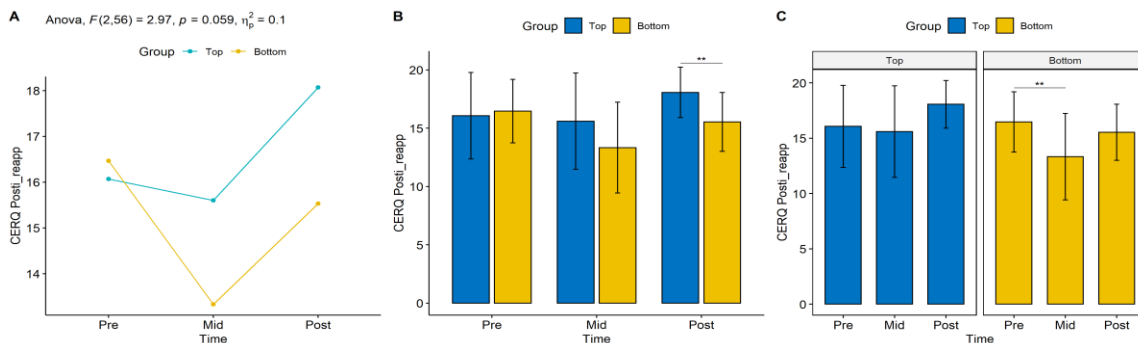


The first, line graph shows that High performers increased their Refocusing plan from Pre to Post period, suggesting an increase in the use of this positive coping mechanism. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods.

CERQ Positive Reappraisal

FIGURE – 5.6 f

CERQ POSITIVE REAPPRAISAL SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



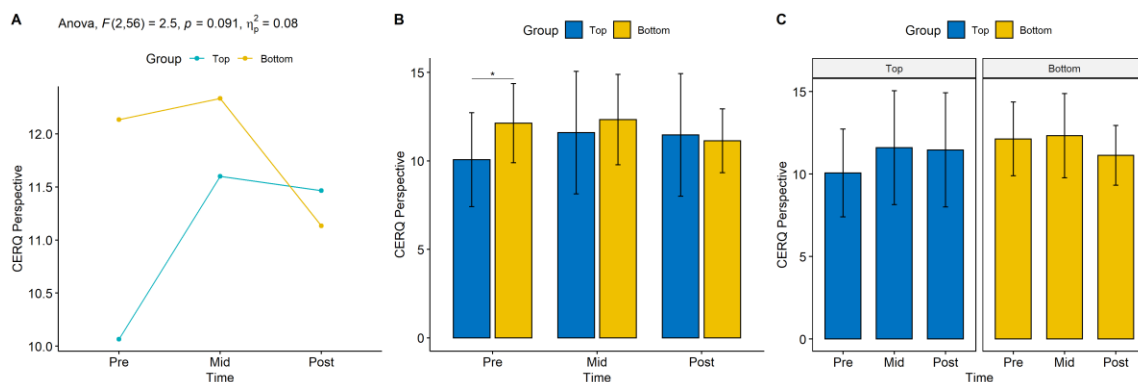
The first, line graph shows that the High performers have made steady increase in the Positive reappraisal scores during Pre to Post periods, suggesting an increase in the use of this coping mechanism over their course of study and the Low performers' scores were

fluctuating. The second, bar graph indicate that the High performers' score is significantly better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers have improved their score during Pre to Post periods. Low performers have made significant improvement during Pre to Mid ($p < 0.01$).

CERQ Perspective

FIGURE – 5.6 g

CERQ PERSPECTIVE SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

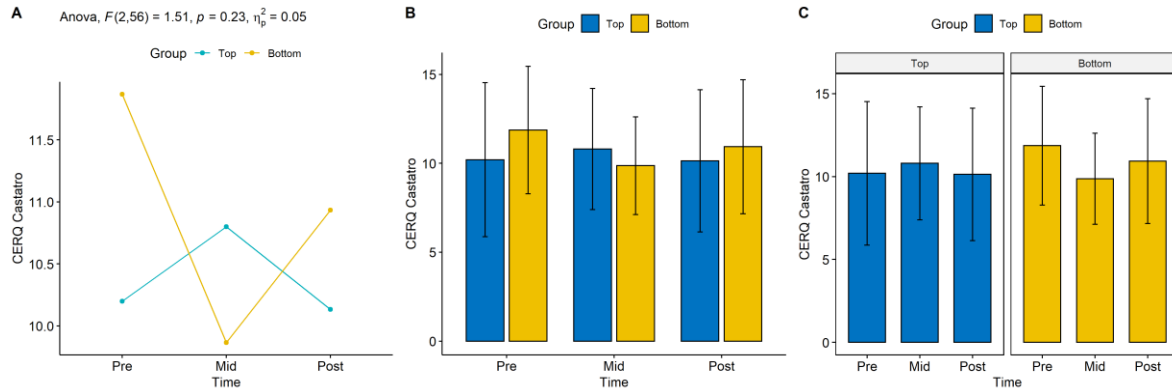


The first, line graph shows that High performers have increased their Perspective score from Pre to Mid and dropped marginally during Post period. The Low performers increased their score from Pre to Mid period and dropped during Post Period. The second, bar graph indicate that the Low performers' score is better than Low performers during Pre and Mid periods. The third, bar graph shows the fluctuation of scores of both High performers and Low performers.

CERQ Catastrophizing

FIGURE – 5.6 h

CERQ CATASTROPHIZING SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

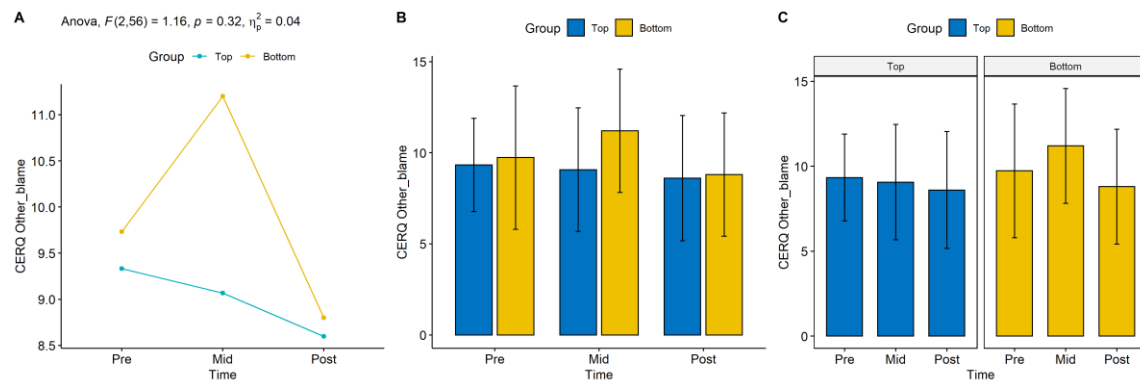


The first, line graph shows that both the groups have fluctuating Catastrophizing scores during Pre, Mid and Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre and Post periods. The third, bar graph shows that both the groups having fluctuating scores during Pre, Mid and Post periods.

CERQ Other blame

FIGURE – 5.6 i

CERQ OTHER BLAME SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



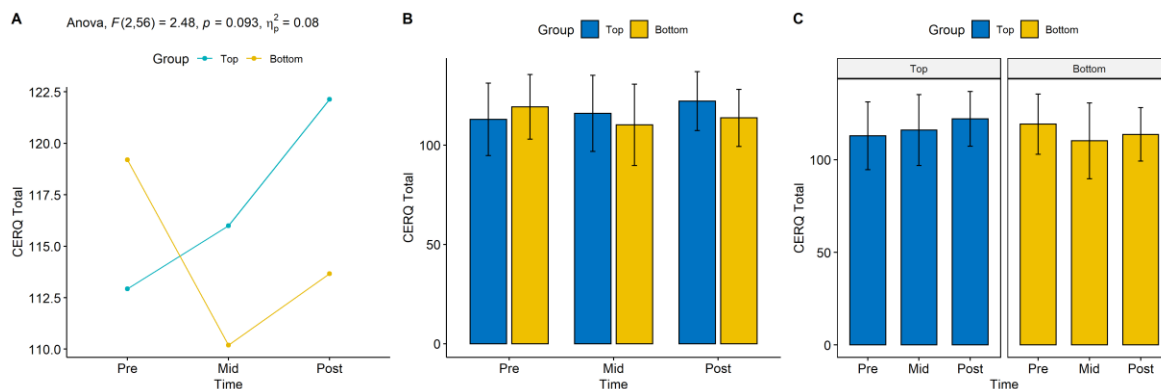
The first, line graph shows that both the groups have dropped their Other-blame score over Pre to Post periods. The second, bar graph indicates that the Low performers' score over Pre to Post periods. The third, bar graph shows that both the groups having fluctuating scores during Pre, Mid and Post periods.

score is better than High performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have dropped their score during Pre to Post periods.

CERQ Total

FIGURE – 5.6 j

CERQ TOTAL SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The first, line graph shows that the High performers have steadily increased their score during Pre, Mid and Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre and Post periods. The third, bar graph shows that both High performers have improved their score during Pre to Post periods and Low performers have dropped their score.

5.2.4.2 GENERAL HEALTH

The Table – 5.7 shows the mean scores and standard deviation of General health questionnaire with four sub-scales - Somatic symptoms, Anxiety/Insomnia, Social Dysfunction, and Severe Depression measured during Pre, Mid and Post periods for High Performing students, and Low performing students.

TABLE – 5.7
MEAN SCORES AND STANDARD DEVIATION OF GENERAL HEALTH
QUESTIONNAIRE

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
GHQ Somatic symptoms						
High academic performers	12.47	4.37	11.20	2.60	10.67	3.85
Low academic performers	12.93	3.71	10.87	2.72	11.73	2.55
GHQ Anxiety Insomnia						
High academic performers	12.13	3.93	11.87	3.52	12.33	4.79
Low academic performers	14.07	3.43	12.87	2.72	12.80	2.88
GHQ Social Dysfunction						
High academic performers	14.00	4.71	11.13	2.26	11.20	3.23
Low academic performers	14.27	3.56	13.27	3.47	12.80	3.03
GHQ Severe Depression						
High academic performers	12.07	4.17	12.00	3.91	11.73	3.79
Low academic performers	13.60	4.00	14.27	3.31	12.73	3.17

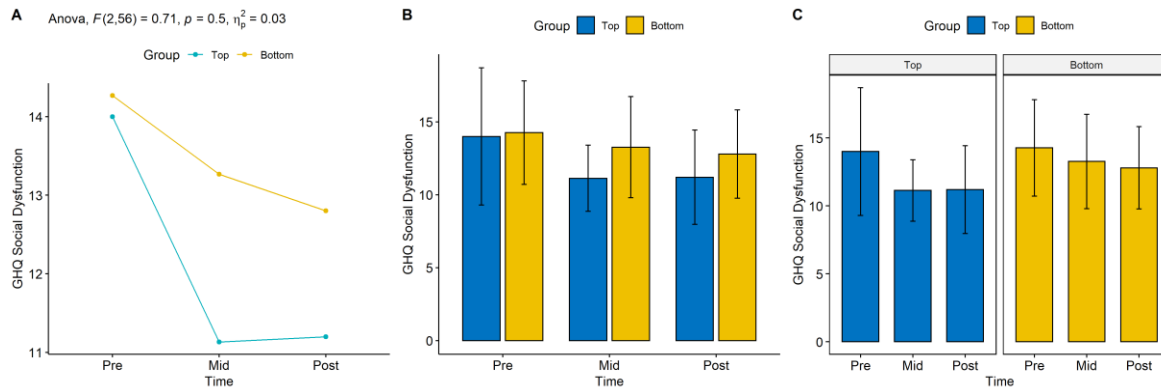
On Somatic symptoms, both groups showed a decrease in scores, High performers from 12.47 to 10.67 and Low performers from 12.93 to 11.73 during Pre to Post periods. On Anxiety/Insomnia, the High performers showed a slight increase in scores and Low performers have showed decrease from 14.07 to 12.80. On Social Dysfunction, both groups showed a decrease with High performers from 14.00 to 11.20 and Low academic performers from 14.27 to 12.80 during Pre to Post periods. On Severe Depression, both groups showed a decrease with High performers from 12.07 to 11.73 and Low performers from 13.60 to 12.73 over Pre and Post periods.

Figure – 5.7 a, 5.7 b, 5.7 c, 5.7 d show the line and bar graphs of several variables of General health scores of High and Low performers over periods Pre, Mid and Post.

GHQ Somatic symptoms

FIGURE – 5.7 a

GHQ SOMATIC SYMPTOMS SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



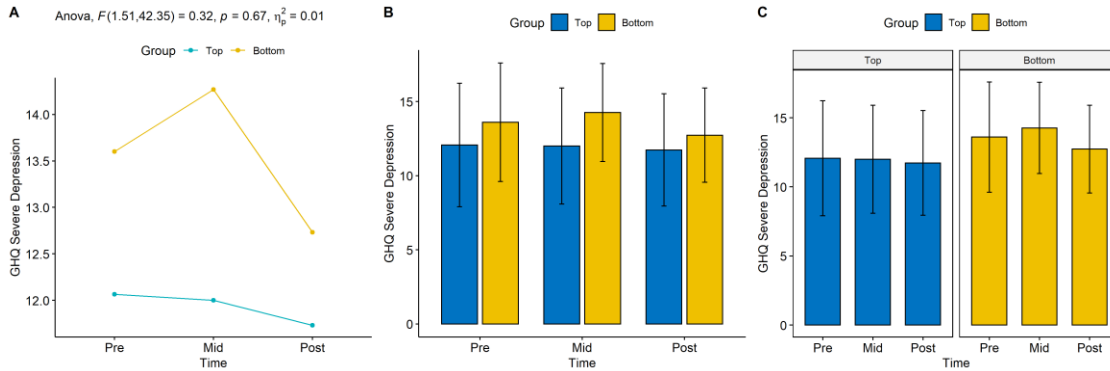
The first, line graph shows that both the groups have shown decrease in the Somatic symptoms scores from Pre to Post periods suggesting a reduction in somatic symptoms. The second, bar graph indicates that the High performers' Somatic symptom score is lower than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

Figure – 5.7 b shows the line and bar graphs of GHQ Anxiety Insomnia scores of High and Low performers over three time periods Pre, Mid and Post.

GHQ Anxiety Insomnia

FIGURE – 5.7 b

GHQ ANXIETY INSOMNIA SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

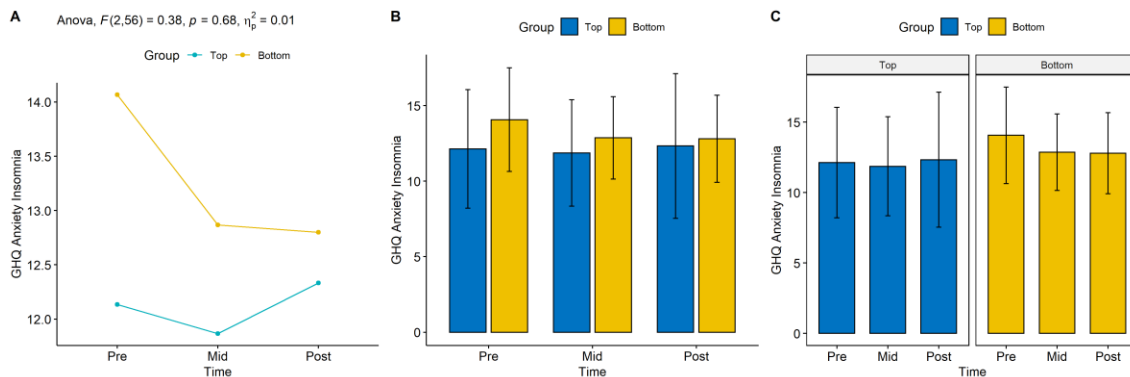


The first, line graph shows that both the groups showed reduction in the Anxiety/Insomnia scores from Pre to Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

GHQ Social dysfunction

FIGURE – 5.7 c

GHQ SOCIAL DYSFUNCTION SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

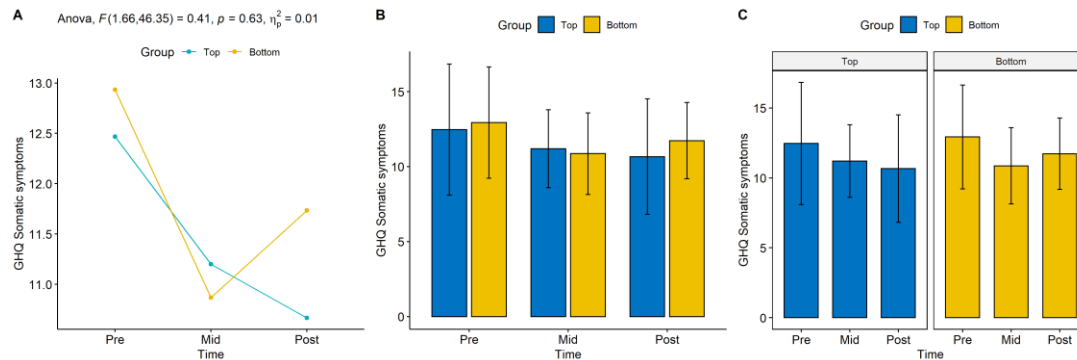


The first, line graph shows that Social Dysfunction score of the Low performers has reduced steadily over Pre, Mid and Post periods suggesting an improvement in social functioning. The High performers' scores slightly reduced from Pre to Mid and increased during Post. The second, bar graph indicate that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that Low performers have improved their score during Pre to Post periods.

GHQ Severe Depression

FIGURE – 5.7 d

GHQ SEVERE DEPRESSION SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The first, line graph shows that Severe Depression scores of both the groups have reduced during Pre to Post periods, suggesting a reduction in depressive symptoms. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

5.2.4.3 WELLBEING

Table – 5.8 shows the mean scores and standard deviation for The Short Warwick-Edinburgh Mental Wellbeing scale measured during Pre, Mid and Post periods for High Performing students, and Low performing students.

TABLE – 5.8

MEAN SCORES AND STANDARD DEVIATION OF WELLBEING

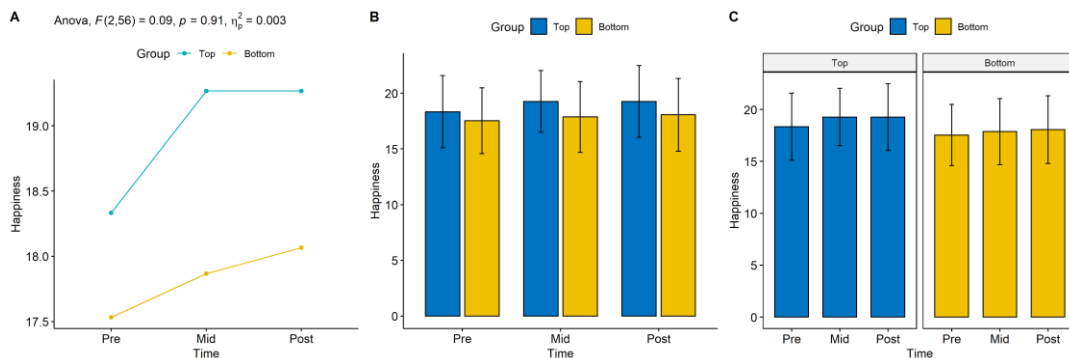
Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
High academic performers	28.93	4.04	28.53	2.56	28.87	2.88
Low academic performers	27.33	4.19	26.53	3.29	28.73	4.04

On somatic symptoms, both groups showed a slight fluctuation with High performers showing marginal decrease in the score from 28.93 to 28.87 and Low performers showing marginal increase from 27.33 to 28.73 during Pre and Post Periods.

Figure – 5.8 shows the line and bar graphs of Wellbeing memory scores of High and Low performers over periods Pre, Mid and Post.

FIGURE – 5.8

WELLBEING SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The first, line graph shows that both the groups have marginally improved wellbeing scores from marginally Pre to Post periods. The second, bar graph indicates that the High performers' score is better than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

5.2.4.4 SHORT DEPRESSION – HAPPINESS SCALE

Table – 5.9 shows the mean scores and standard deviation for Short Depression – Happiness Scale (SDHS) measured during Pre, Mid and Post periods for High Performing students, and Low performing students.

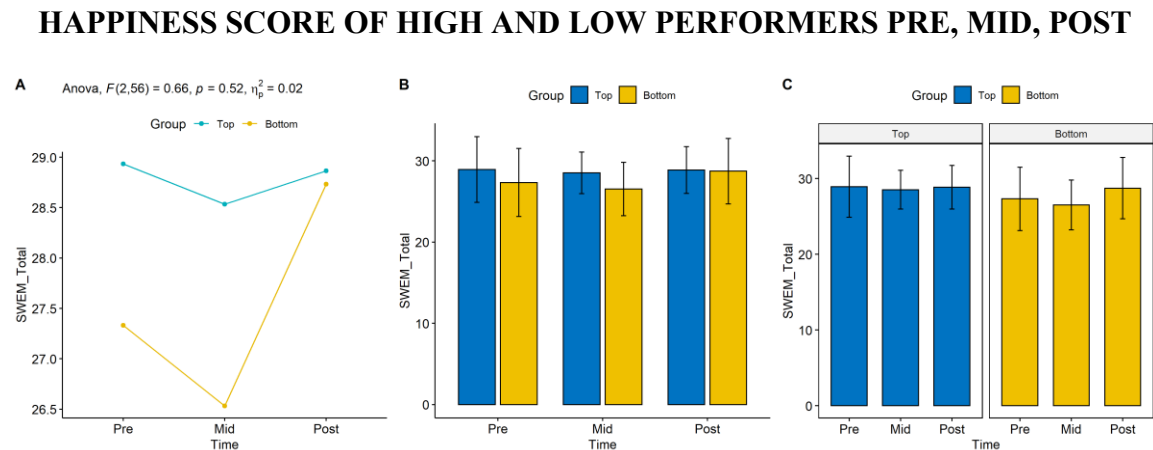
TABLE – 5.9
MEAN SCORES AND STANDARD DEVIATION OF HAPPINESS

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
High academic performers	18.33	3.24	19.27	2.76	19.27	3.22
Low academic performers	17.53	2.95	17.87	3.18	18.07	3.26

On Happiness, both groups showed an increase in the scores with High performers from 18.33 to 19.27 and Low performers from 17.53 to 18.07 during Pre and Post periods.

Figure – 5.9 shows the line and bar graphs of Happiness scores of High and Low performers over periods Pre, Mid and Post.

FIGURE – 5.9



The first, line graph shows that both the groups have improved Happiness scores from Pre to Post periods suggesting an increase in happiness and/or a decrease in depressive states. The second, bar graph indicates that the High performers' score is better

than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have improved their score during Pre to Post periods.

5.2.4.5 BARRATT IMPULSIVENESS SCALE

Table – 5.10 shows the mean scores and standard deviation for Barratt Impulsiveness Scale with three sub-scales Attentional Impulsiveness (BIS Attention), Motor Impulsiveness (BIS Motor), and Non-Planning Impulsiveness (BIS Non Planning) measured during Pre, Mid and Post for High Performing students, and Low performing students.

TABLE – 5.10
MEAN SCORES AND STANDARD DEVIATION OF BIS

Variables	Pre		Mid		Post	
	M	SD	M	SD	M	SD
BIS Attention						
High academic performers	17.00	4.83	17.40	3.02	17.20	4.07
Low academic performers	22.00	4.00	20.13	3.64	18.73	4.08
BIS Motor						
High academic performers	26.40	4.39	23.20	3.88	24.40	5.18
Low academic performers	28.20	4.72	28.33	4.17	27.07	3.73
BIS Non-Planning						
High academic performers	25.07	12.03	18.40	9.46	16.47	9.66
Low academic performers	39.47	1.88	28.33	10.98	25.47	13.43

The Barratt Impulsiveness scores, consists of three subscales: Attentional Impulsiveness (BIS Attention), Motor Impulsiveness (BIS Motor), and Non-Planning Impulsiveness (BIS Non Planning). On BIS attention, the High performers showed slight increase from

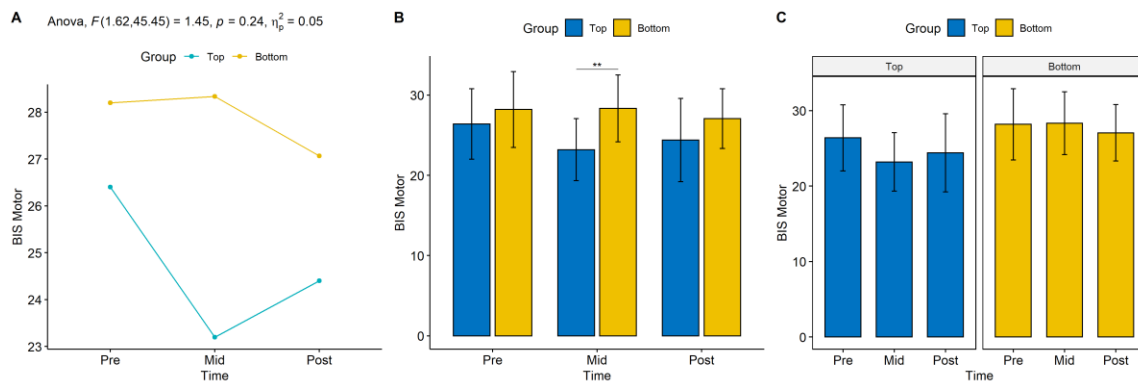
17.00 to 17.20 and Low performers showed decrease from 22.00 to 18.73 from Pre to Mid periods, suggesting reduction in the attentional impulsivity of the Low performers. On BIT Motor, both the groups showed decrease with High performers from 26.40 to 24.40 and Low performers from 28.20 to 27.07 over Pre to Post periods. On BIS Non Planning, both the groups showed decrease with High performers from 25.07 to 16.47 and Low performers from 39.47 to 25.47 during Pre and Post periods, suggesting a reduction in non-planning impulsivity.

Figures – 5.10 a, 5.10 b, 5.10 c show the line and bar graphs of scores of variables of Psychological wellbeing of High and Low performers over periods Pre, Mid and Post.

BIS Attention

FIGURE – 5.10 a

BIS ATTENTION SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

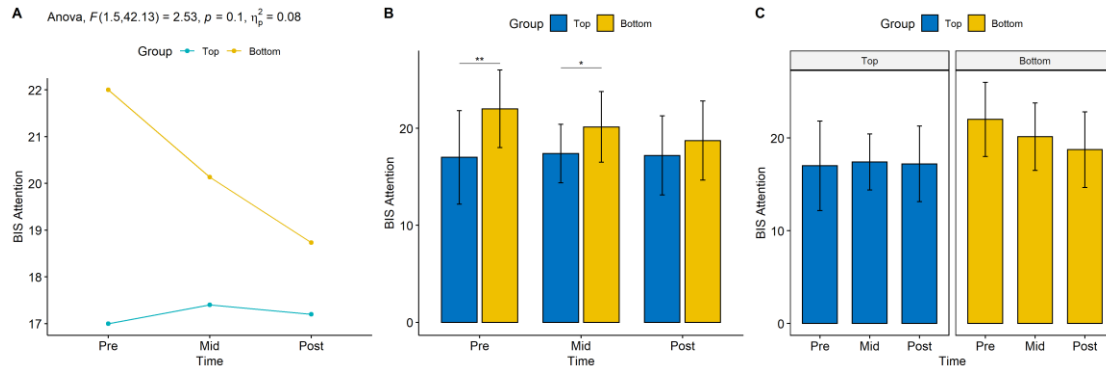


The first, line graph shows that both the groups have decreased their BIS attention scores from Pre to Post periods suggesting a reduction in attentional impulsivity. The second, bar graph indicates that the High performers' score is lower than Low performers during Pre, Mid and Post periods. The third, bar graph shows that both High performers and Low performers have decreased scores during Pre to Post periods.

BIS Motor

FIGURE – 5.10 b

BIS MOTOR SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST

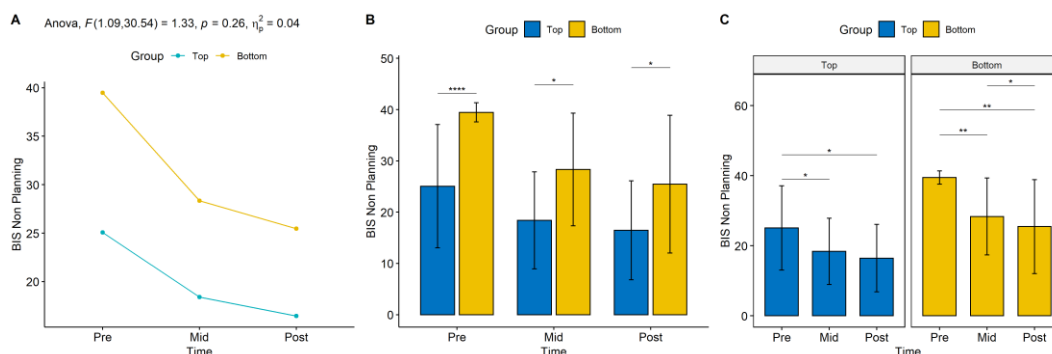


The first, line graph shows that Low performers showed steady reduction in BIS Motor scores from Pre to Post periods. The second, bar graph indicates that the High performers' scores are lower than Low performers during Pre, Mid and Post periods. The third, bar graph shows the progress made by Low performers while High performers maintained their lower scores during Pre to Post periods.

BIS Non-planning

FIGURE – 5.10 c

BIS NON-PLANNING SCORE OF HIGH AND LOW PERFORMERS PRE, MID, POST



The first, line graph shows that both the groups have reduced their BIS Non Planning scores significantly over Pre, Mid Post periods. The second, bar graph indicates that the High performers' score is significantly lower than the Low performers during

Pre ($p < 0.0001$), Mid ($p < 0.05$), Post ($p < 0.05$) periods. The third, bar graph shows that High performers' score significantly decreased during Pre to Mid ($p < 0.05$), Post ($p < 0.05$) periods. The low performers' score is significantly reduced during Pre to Mid ($p < 0.01$), Pre to Post ($p < 0.01$) periods. These results suggest that the SKY practice may have had a positive effect on impulsivity and impulse control disorders for both the High and Low performers.

5.3 INTERPRETATION

The summary of the scores of two groups on Pre, Mid and Post were prepared as shown in Table – 5.11.

TABLE – 5.11

**CONSOLIDATED STATEMENT SHOWING SIGNIFICANT IMPROVEMENT
AND POSITIVE TREND**

Dimension	Tool	High Performers			Low Performers			Positive Correlation (r, p value)
	Variables	Pre	Mid	Post	Pre	Mid	Post	
Academic	Top	92.80	90.73	91.73	67.13	72.27	76.60	
Physical	BMI	18.67	19.00	18.67	17.00	18.67	20.00	
Attention	DLST Score	64.67	59.33	72.93	58.73	57.13	65.20	($r = 0.153$, $p < .001$)
	SLCT Score	44.67	46.40	47.20		43.87	39.73	($r = 0.153$, $p < .001$).
	DVT Score	88.13	78.20	79.13		82.73	70.60	
Executive function	Word Stroop	101.93	114.47	121.27	95.47	100.80	108.60	($r = 0.267$, $p < .001$)
	Color Stroop	72.67	81.73	86.67	67.33	70.93	77.47	($r = 0.352$, $p < .001$)
	Word Color	47.73	59.00	63.33	37.87	44.47	52.60	($r = 0.534$, $p < .001$)
	SMT Score	57.00		66.93	51.13	58.20	59.73	
Memory	Digit Forward	9.40		9.53	8.47	10.13	9.13	
	Digit Backward	7.27	8.07	7.60	6.13	6.93	7.47	

Dimension	Tool	High Performers			Low Performers			Positive Correlation
	Variables	Pre	Mid	Post	Pre	Mid	Post	(r, p value)
Emotional regulation (CERQ)	Self-blame	11.80	12.93	13.53	13.47	11.73	11.53	(r = 0.327, p < .001)
	Acceptance	13.40	13.13	13.93	13.27	12.47	13.53	(r = 0.355, p < .001)
	Rumination	12.33	13.73	14.53	12.93	13.73	13.00	(r = 0.355, p < .001)
	Positive refocus	13.13	13.80	14.13	13.47	12.20	12.87	(r = 0.176, p < .001)
	Refocusing plan	16.60	15.33	17.73	15.87	13.33	16.33	(r = 0.097, p < .05)
	Positive reapp	16.07	15.60	18.07	16.47	13.33	15.53	(r = 0.331, p < .001)
	Perspective	10.07	11.60	11.47	12.13	12.33	11.13	(r = 0.105, p < .05)
	Catastrophizing	10.20	10.80	10.13	11.87	9.87	10.93	
	Other blame	9.33	9.07	8.60	9.73	11.20	8.80	
	Total	112.93	116.00	122.13	119.20	110.20	113.67	
General Health (GHQ)	Somatic symptoms	12.47	11.20	10.67	12.93	10.87	11.73	
	Anxiety Insomnia	12.13	11.87	12.33	14.07	12.87	12.80	
	Social Dysfunction	14.00	11.13	11.20	14.27	13.27	12.80	
	Severe Depression	12.07	12.00	11.73	13.60	14.27	12.73	(r = 0.105, p < .05)
Happiness & wellbeing	Wellbeing	28.93	28.53	28.87	27.33	26.53	28.73	(r = 0.327, p < .001)
	Happiness	18.33	19.27	19.27	17.53	17.87	18.07	(r = 0.260, p < .001)
Impulsivity	BIS Attention	17.00	17.40	17.20	22.00	20.13	18.73	
	BIS Motor	26.40	23.20	24.40	28.20	28.33	27.07	
	BIS Non Planning	25.07	18.40	16.47	39.47	28.33	25.47	

p < 0.001
 p < 0.01
 p < 0.05
 Good imp
 Marginal imp

In Table – 5.11, significant improvements, and positive trends of both the groups are marked with following color codes:

- Significant improvements with ($p < 0.0001$) & ($p < 0.001$) are marked dark green.
- Significant improvements with ($p < 0.01$) are marked medium green
- Significant improvements with ($p < 0.05$) are marked light green
- Positive trend of improvement at higher level is marked medium amber
- Positive trend of improvement at marginal level is marked light amber

This summary provided a clear picture of the effect of SKY practices on both the groups on the wellness and academic performance. Following are the interpretations from this summary:

- SKY practices seem to have made greater effect on the cognitive functions of mental wellbeing in terms of Attention, Executive function for both the groups.
- In the case of High performers, Stroop word, Color Stroop, Word Color Stroop and BIS Non-Planning scores showed significant improvement with ($p < 0.05$) and DLST with ($p < 0.01$).
- In the case of Low performers, BMI, Stroop word, Color Stroop, Word Color Stroop, BIS Non Blame showed significant improvement with BMI and Word Color with ($p < 0.001$) and Color Stroop and BIS Non-Planning with ($p < 0.01$) and others at ($p < 0.01$).
- Improvements made by the Low performing group is highly significant compared with other group on few parameters which seem to have impacted significant improvement in the academic performance with both Pre to Mid ($p < 0.01$), Mid to Post ($p < 0.001$) and Pre to Post (0.0001).
- On those dimensions, where there was no significant improvement, the Low performers seem to have responded better on several dimensions with the positive trend at higher and medium level
- Most of the wellness scores of High performers were higher from Pre stage onwards and they still made progress on several parameters.

- The academic score of High performers was high in the first year at 92.8% and they have sustained the high performance in all the years.
- The significant improvements noticed on the dimensions more on the Pre to Post than Pre to Mid. This indicates that effect of SKY can be noticed with sustained practice.
- In order to find the correlation between improvement of wellness dimensions and academic performance, p value and r value were determined of both the groups. Highly significant and positive correlation was noticed in the following dimensions in the case of Low performers as shown in Annexure – 14.
 - Attention: DLST Score ($r = 0.153$, $p < .001$), SLCT Score ($r = 0.153$, $p < .001$).
 - Executive function: Word Stroop ($r = 0.267$, $p < .001$), Color Stroop ($r = 0.267$, $p < .001$), Word Color ($r = 0.534$, $p < .001$).
 - Emotional regulation (CERQ): Self-blame ($r = 0.327$, $p < .001$). Acceptance ($r = 0.355$, $p < .001$), Rumination ($r = 0.355$, $p < .001$), Positive refocus ($r = 0.176$, $p < .001$), Refocusing plan ($r = 0.097$, $p < .05$), Positive reapp ($r = 0.331$, $p < .001$) Perspective ($r = 0.105$, $p < .05$)
 - General Health (GHQ): Severe Depression ($r = 0.105$, $p < .05$)
 - Wellbeing: ($r = 0.105$, $p < .05$)
 - Happiness: ($r = 0.260$, $p < .001$)
- As the High performers maintained a mean score of above 90, there was not enough scope to improve the score further. Hence the correlation between wellness dimensions and academic performance was negative.

5.4 CONCLUSION

Hypothesis 1: It is proved that there is a correlation between dimensions of wellness and academic performance of students in higher education. i.e Significant improvements made by Low performers in their wellness scores especially the cognitive functions such as attention, executive function and memory shows a significant correlation with their improvement in the academic performance in the Mid and Post periods (R value ranging from 0.15 to 0.53)

Hypothesis 2: It is proved that the SKY practices had significant positive effect on the cognitive functions such as attention, executive function, and memory of both groups over Mid and Post periods with p value lower than 0.001, 0.01, 0.05 on the several tools measured. Most of the other dimensions showed positive trend of improvement in wellness dimensions of both groups. The effect of SKY practice on the Low performer was greater than that of High performers.

Hypothesis 3: It is proved that the SKY practices have had a significant improvement of the academic performance of the Low performers from 67.13 to 72.27 during Mid ($p < 0.001$) and 76.60 during Post ($p < 0.001$). The High performers were at 92.80 during Pre and there was limited room for increase, but SKY practices had a positive effect on sustaining their high performance over Mid and Post with 90.70 and 91.70 during Mid and Post respectively.

Overall, the practice of SKY yoga had a positive effect on the wellness and academic performance of the students in higher education.

CHAPTER VI

FINDINGS AND CONCLUSION

6.0 INTRODUCTION

The objective of this research study is to find the effect of Simplified Kundalini Yoga (SKY) practices on the physical, mental, and social wellness and academic performance of students in higher education. The review of literature revealed that youth go through several challenges and most of them are relating to their wellness which impacts their realizing their academic and career goals. The qualitative study was carried out with ten Focus Group Discussions (FGD) with students in higher education. This revealed that the students face challenges in articulating and realizing the academic and career goals. This is due to is due to – difficulty in maintaining wellness and difficulty faced in having an active engagement in pursuing their goals. The difficulty in maintaining wellness was due to lack of energy and physical fitness, ignorance of enablers for learning, and lack of balanced approach to social relationship. Based on this finding, the dimensions of wellness at physical, mental, and social levels and tools to measure them have been determined. SKY practices were studied for the potential benefits aligned to the dimensions of wellness. Yoga training was provided to 98 diploma students over three years and they practised SKY daily. The wellness and academic performance were measured for three years – Pre, Mid and Post. The wellness data and academic performance were analyzed for High and Low performers. The longitudinal study showed interesting outcomes on the low performers.

6.1 FINDINGS OF THE RESEARCH STUDY

The study on “The effect of SKY practices on wellness and performance of students in higher education” took a comprehensive approach by assessing variety of variables physical (BMI), cognitive functions (attention, executive function, memory), emotional regulation, impulsivity, mental well-being, depression-happiness, and academic performance. This allowed for a more holistic understanding of the effects of the yoga-based intervention. The longitudinal design of the study, with data collection points at Pre, Mid, and Post periods, allowed for the examination of changes over time and the sustainability of these changes. The study used a variety of validated measures, ensuring the reliability and validity of the data collected. The study included both High and Low academic performers

based on the first semester marks. The use of a SKY-based intervention is a strength as it is a non-invasive, low-cost, and accessible intervention that can be easily implemented in various settings.

The findings are as follows:

6.1.1 ACADEMIC PERFORMANCE

- High performers maintained significantly higher score of >90% than Low performers during Pre ($p<0.001$), Mid ($p<0.001$), and Post ($p<0.001$) periods.
- The Low performers have significantly improved their score during Pre to Mid ($p < 0.01$), Mid to Post ($p<0.001$) and Pre to Post ($p<0.0001$) periods with a mean score of 67.13%, 72.27%, and 76.60% respectively.
- The results suggest that the SKY practice may have had different effects on the academic performance of the High and Low performers over two years.
- Sustained SKY practices may have resulted in significant improvement of academic performance of Low performers i.e. their mean value increased from 67.13% to 76.60% while High performers sustained their high performance i.e. above 90%. This proved that regular SKY practices improve academic performance of the students in higher education.

6.1.2 PHYSICAL WELLNESS - BMI

- The BMI of Low performers improved during Pre, Mid, and Post periods with a mean score of 17.00, 18.67, and 20.00 respectively. The Low performers improved their BMI significantly Pre to Post period ($p < 0.01$). The High performers maintained the mean BMI score of 18.67 consistently from Pre and Post periods.
- The study suggest that SKY practice may have had different effects on the BMI of the High and Low performers over time.

6.1.3 MENTAL WELLNESS

6.1.3.1 ATTENTION

- DLST Score: Both High and Low performers, improved their mean scores during Pre to Post periods. During Post period, the mean score of High performers is significantly higher than the Low performers ($p < 0.05$). High performers have improved their mean DLST scores significantly during Pre to Post period ($p < 0.05$) and Mid to Post period ($p < 0.01$).
- SLCT Score: Both High and Low performers improved their scores from Pre to Post period. During Pre period, High performers' score is significantly higher compared with Low performers ($p < 0.01$). This suggest that SKY practice may have had different effects on attention and cognitive processing for the High and Low performers as measured by the SLCT.
- DVT score: Both High and Low performers improved their mean score from Pre to Post periods. Low performers' score is significantly better than with High performers during Post ($p < 0.05$) period. This suggests that the SKY practice may have had a substantial positive impact on the sustained attention of the Low performers.

6.1.3.2 EXECUTIVE FUNCTION

- Color Stroop test: Both the groups have improved the scores consistently from Pre to Mid and to Post periods. High performers' score is significantly better compared with Low performers during Mid ($p < 0.05$) period. Both High performers ($p < 0.05$) and Low performers ($p < 0.01$) have significantly improved their score during Pre to Post periods.
- Word Color Stroop test: Both the groups have improved scores consistently from Pre to Mid and to Post periods. This suggests that both groups improved in basic reading ability and speed, colour recognition and naming speed over the course of the study. High performers' score is significantly better than Low performers during Pre ($p < 0.01$), Mid ($p < 0.05$) and Post ($p < 0.05$) periods. High performers ($p < 0.05$) and Low performers ($p < 0.001$) have significantly improved their score Pre to Post periods. Overall, SKY practice had a positive effect on cognitive processing capabilities and executive functioning for both the High and Low performers.

- SMT score: Both the groups have improved the scores consistently from Pre to Mid and to Post periods. This suggests that both groups improved in their cognitive abilities such as perception, encoding, retrieval processes, transformation of information stored in active memory, and decision making over the course of the study. High performers' score is better than Low performers during Pre, Mid and Post periods suggest that High performers have consistently outperformed the Low performers.
- All the variables of executive function of both the groups showed increasing value due to regular SKY practice.

6.1.3.3 MEMORY

- Digit forward memory scores: Both the groups have improved the scores from Pre to Post periods suggesting that SKY practice may have had a positive effect on immediate memory span and attention. High performers' score is better than Low performers during Pre, Mid and Post periods. Both High performers and Low performers have improved their score during Pre to Post periods.
- Digit backward memory scores: Both the groups have improved the scores from Pre to Post periods suggesting that SKY practice may have had a positive effect on attention, immediate memory span, and working memory capabilities. High performers' score is better than Low performers during Pre, Mid and Post periods. Both High performers and Low performers have improved their score during Pre to Post periods.

6.1.4 SOCIAL WELLNESS

6.1.4.1 EMOTIONAL REGULATION

In general, both groups showed fluctuations in scores across the different sub-scales over time. However, some patterns are observed:

- On Self-blame, the High performers showed a steady increase in scores from 11.80 to 13.53, suggesting an increase in the use of self-blame as a coping mechanism.
- On Acceptance, both groups showed a marginal increase in scores from the Pre to the Post periods with High performers 13.40 to 13.93 and Low performers 13.27 to

13.53 respectively, suggesting an increase in the use of acceptance as a coping mechanism.

- On Rumination, the High performers showed a steady increase in scores over time with 12.33 to 14.53, suggesting an increase in the use of rumination as a coping mechanism.
- On Positive Refocusing, Refocus on Planning, and Positive Reappraisal, both groups generally showed an increase in scores over time, suggesting an increase in the use of these positive coping mechanisms over the course of the study.
- On Perspective, Catastrophizing, and Other-blame subscales, the scores fluctuated for both groups, suggesting variability in the use of these coping mechanisms over time.

Overall, these results suggest that the yoga-based intervention may have influenced the cognitive coping mechanisms used by the High and Low Performers in response to stressful events. However, the effects varied between the two groups and between the different coping mechanisms assessed.

6.1.4.2 GENERAL HEALTH QUESTIONNAIRE

- Somatic symptoms: Both the groups have showed reduction in somatic symptoms from Pre to Post periods with High performers from 12.47 to 10.67 and Low performers from 12.93 to 11.73. High performers' score is better than Low performers during Pre, Mid and Post periods.
- Anxiety/Insomnia: Low performers showed reduction in the Pre to Post periods from 14.07 to 12.80 suggesting reduction anxiety and insomnia symptoms. High performers' score is better than Low performers during Pre, Mid and Post periods.
- Social Dysfunction: Both the groups have reduced the score steadily over Pre to Post periods with High performers from 14.00 to 11.20 and Low performers from 14.27 to 12.80 suggesting an improvement in social functioning. High performers' score is better than Low performers during Pre, Mid and Post periods.

- Severe Depression: Both the groups have reduced the score during Pre to Post periods with High performers from 12.07 to 11.73 and Low performers from 13.60 to 12.73 suggesting a reduction in depressive symptoms. High performers' score is better than Low performers during Pre to Post periods.
- Regarding general health, anxiety insomnia considerably reduced by 14.01 to 12.80 for the Low performers.

6.1.4.3 WELLBEING

Both the groups have improved wellbeing scores from marginally from Pre to Post periods. The High performers' score is better than Low performers during Pre, Mid and Post periods.

6.1.4.4 SHORT DEPRESSION – HAPPINESS SCALE

Both the groups have improved happiness scores from pre to post periods suggesting an increase in happiness and/or a decrease in depressive states. The high performers' score is better than low performers during pre, mid and post periods.

6.1.4.5 BARRATT IMPULSIVENESS SCALE

BIS attention scores: Both the groups have showed decrease in their scores from Pre to Post periods suggesting a reduction in attentional impulsivity. The score of High performers is lower than Low performers during Pre, Mid and Post periods.

BIS Motor scores: Low performers showed steady reduction from Pre to Post periods. High performers' scores are lower than Low performers during Pre, Mid and Post periods.

BIS Non Planning scores: Both the groups have reduced their score significantly over Pre, Mid and Post periods. High performers' score is significantly lower than the Low performers during Pre ($p < 0.0001$), Mid ($p < 0.05$), and Post ($p < 0.05$) periods. High performers' score significantly decreased during Pre ($p < 0.05$), Mid ($p < 0.05$), and Post ($p < 0.05$) periods. The low performers' score is significantly reduced during Pre ($p < 0.01$), Mid ($p < 0.01$), and Post ($p < 0.05$) periods.

6.1.5 CORRELATION BETWEEN WELLNESS AND ACADEMIC PERFORMANCE

Highly significant and positive correlation between wellness scores and academic performance of Low performers was observed during Post period for the following dimensions:

- Attention: DLST Score ($r = 0.153$, $p < 0.001$), SLCT Score ($r = 0.153$, $p < 0.001$).
- Executive function: Word Stroop ($r = 0.352$, $p < 0.001$), Color Stroop ($r = 0.267$, $p < 0.001$), Word Color ($r = 0.534$, $p < 0.001$).
- Emotional regulation (CERQ): Self-blame ($r = 0.327$, $p < 0.001$). Acceptance ($r = 0.355$, $p < .001$), Rumination ($r = 0.355$, $p < 0.001$) Positive refocus ($r = 0.176$, $p < 0.001$), Refocusing plan ($r = 0.097$, $p < 0.05$), Positive reapp ($r = 0.331$, $p < 0.001$) Perspective ($r = 0.105$, $p < .05$).
- General Health (GHQ): Severe Depression ($r = 0.105$, $p < .05$).
- Wellbeing: ($r = 0.327$, $p < 0.001$), Happiness: ($r = 0.260$, $p < 0.001$)

As the High performers maintained a mean score of above 90, there was not enough scope to improve the score further. Hence the correlation between wellness dimensions and academic performance was found to be negative.

Overall, the findings of the study include:

- SKY yoga had significant effect on the Cognitive domain. There was a positive trend with other dimensions of wellness.
- Low performers wellness and academic scores were lower than the High performers. They seem to have responded better than the other group.
- There seems to be a correlation between the wellness scores to academic performance especially scores relating to cognitive domains like attention, executive functions and memory, Severe depression, Wellbeing and Happiness.
- The effects of yoga on the wellness takes time, over two years, many dimensions have shown significant shift. Further practice might have significant impact on other dimensions which showed positive trend.

6.2 RECOMMENDATIONS

Based on the research study, following are the recommendations for leveraging the findings of the study:

1. The challenges faced by the students in higher education in terms of their wellness can be addressed by SKY practices. SKY practices have the potential to address wellness and academic performance based on this study. However, the students will consider learning and practising SKY only if there is scientific evidence that there would be a significant benefit of such practice. The findings of such action research need to be shared with students as part of their orientation and induction in the first year and they should have an opportunity to learn and practise regularly.
2. The National Education Policy actively promote ‘Competency based education’ across primary, secondary, and tertiary education. This calls for well articulating the outcomes well for every course including Yoga and designing the learning content and methodology of teaching and learning. Eventually, competency is about connecting the learning content within the context of the audience regarding the problem they would like to solve.
3. It is possible to evolve the concept of a wellness laboratory based on the dimensions and tools used for this research. A proof of concept can be tried in one of the colleges to enable measurement of large number of students with technology solutions such as IoT based physical measurements for automatic capture of data, web-based tools for other questionnaire-based assessments, back-end analytics and dashboards using apps for students, teachers, and management with dashboards for them to manage.
4. The students who take up such wellness assessment, can sign up for SKY training and practice and for being part of experimental group. Then, it is possible to develop large database of practitioners of SKY, control group who go through only wellness measurements. With this, it is possible to develop and validate several hypotheses. This can be used for building conviction and commitment of students in higher education to learn and practise SKY.

6.3 AREA FOR FURTHER RESEARCH

- Future studies should include a control group that does not receive the yoga-based intervention to allow for a more definitive conclusion about the effects of the intervention.
- Future studies should examine the effects of the yoga-based intervention in different demographic groups to determine if the results generalize to other populations.
- Future research could examine additional variables that may be affected by the yoga-based intervention such as other dimensions of physical wellness, stress levels, self-esteem, or other aspects of physical health.
- Future studies should aim to understand the mechanisms through which the yoga-based intervention affects the various outcomes, which could help optimize the intervention.
- Future research could compare the effects of different types of yoga to determine if certain styles or practices are more effective than others.
- Future studies could examine individual differences that may influence the effects of the yoga-based intervention, such as personality traits, baseline fitness levels, or previous experience with yoga.
- Future research could include qualitative data, such as interviews or focus groups, to gain a deeper understanding of participants' experiences with the yoga-based intervention.

6.4 CONCLUSION

The study, 'The effect of SKY on wellness and academic performance of students in higher education' examined that data on the dimensions of wellness collected at three different time points: Pre (Prior to start of first year), Mid (Prior to start of second year), and Post (Prior to start of third year) and academic performance during first, second and third year. The study validated the hypothesis of the research with the following findings: It is proved that there is a significant, positive correlation between the improvement in the key wellness dimensions to the academic performance of Low performers during

Pre to Post periods, It is proved that the SKY practices had significant positive effect on the cognitive functions such as attention, executive function of both groups over Pre and Post periods on the several tools measured. It is proved that the SKY practices have had a significant improvement of the academic performance of the Low performers. Further research would be needed to understand these effects and their implications for the use of yoga-based interventions in academic settings on larger sample groups.