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Research Article

Effects of Yogic Exercise on Haematological Parameters in Medical Students Under Examination Stress

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ABSTRACT:

Introduction: Yoga through its techniques of asanas, and pranayama results in a positive effect in the management of stress among teenagers. Pranayama has an effect in regulating stress which in turn is reflected by increased performance in enhancing the workload capacity, because of increased ability for handling stress, which in turn reflected by increase in subjective scores. Haematological changes include changes in blood cell counts and haematocrit. On the basis of above statements, here I have chosen some Yogic asanas and pranayamas, with their benefits.

Aims and Objectives: The aim of this study is to find out the effect of Yogic exercise on Hematological parameters in medical students under examination stress.

Material and Methods: 150 medical students of 17-24 years age group in the Santosh Medical College, Ghaziabad, were chosen depending on the Inclusion and Exclusion Criteria. They were divided into Control and Study group of 75 subjects each. The Haematological parameters of the Subjects were taken, 40 days before the examination and during examination, without and with yogic interventions, respectively.

Statistical Evaluation: The statistical evaluation of this study was be done by using the software SPSS (Software Package of Social Studies), designed by the TISS (Tata Institute of Social Studies).

Result: Total RBC count, Total WBC count and Haematocrit values are significantly increases ($p<0.001$) at the time of examination in study group subjects, but the same significantly decreases ($p<0.001$) at the time of examination in control group subjects. Total Platelet count significantly increases ($p<0.001$) in control group subjects, but this increase is insignificant ($p=0.736$) in study group subjects.

Conclusion: From this study here we concluded that the practice of yogic asanas and pranayama not only reduces these adverse effects of examination stress, but also produces beneficiary effects on haematological parameters, that will help the medical students to perform better in examination.

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INTRODUCTION:

Yoga is becoming an increasingly popular mind-body therapy used to reduce and prevent the harmful effects of stress on the body.[1]"Pranayama" is the fourth limb of Ashtanga Yoga and has its earliest references in the Vedic literature, which extends back from approximately 1500BC backward into a hoary past. Yoga through its techniques of asanas, and pranayama results in a positive effect in the management of stress among teenagers.[2]Pranayama has an effect in regulating stress which in turn is reflected by increased performance in enhancing the workload capacity, because of increased ability for handling stress, which in turn reflected by increase in subjective scores.[3]Hematological changes include changes in blood cell counts and hematocrit. On the basis of the above statements, here I have chosen some Yogic asanas and pranayamas, with their benefits.

STUDY DESIGN:

Initially 150 subjects were selected from medical students of 17-24 years age group in the Santosh Medical College, Ghaziabad, depending on the Inclusion and Exclusion Criteria. All the subjects were asked to come to the laboratory within 8-9 a.m., 50 days before their 3rd internal assessment examination. Then the subjects were allowed to take rest for 30 min. then 5ml blood was withdrawn from each student for measuring Hematological parameters. During the whole procedure, the environmental conditions was kept constant at room temperature = 27-32^{O}C. After the initial study, selected subjects were divided into 02 groups: ***Control Group*** and ***Study Group***, with 75 subjects in each group. ***Control Group*** subjects were asked to come for the experimental procedure after 40 days at the time of their examination. The subjects of ***Study Group*** were asked to come to yoga lab at 07:00 a.m. sharp for yogic asanas and pranayamas for 40 days. In first 2 weeks subject will participate in monitored sessions for 03 days a week (Total 06 days Monitored sessions) under supervision of appointed yoga trainer. After that the subjects will practice the same for 17 days under direct supervision of the yoga trainer and 17 days at their own with each alternate day. Each session will last for 01 hour. During each session, subjects practiced the following asanas and pranayamas.[4,5] After 40 days, at the time of their examination, all the Hematological parameters were tested again in both the groups.

Table 1: Asanas and Pranayamas included in this study

Name of the practice	Repetition	Duration (59 min) Approx
Loosening practices	1	10 min
Makarasana	2	02 min
Tadasana	2	02 min
Trikonasana	2	02 min
Veerasana	2	02 min
Ardha Kati Chakrasana	2	02 min
Vakrasana	2	02 min
Matsyasana	2	02 min
AnulomVilom Pranayama	3	10 min
Bhramari Pranayama	3	10 min
Savasana	1	15 min

MATERIAL AND METHODS:

Ethical Clearance: This study was conducted in the Department of Physiology, Santosh Medical College, Ghaziabad. Ethical clearances were obtained from the institutions before carrying out the project.

Study population: The selection of the samples was done from medical students of 17-24 years age group in the Santosh Medical College, Ghaziabad.

Place of Study: Physiology department in Santosh Medical College & Hospital, Ghaziabad.

Sample Size:

t tests – Means: Difference between two dependent means (matched pairs)

Analysis: A priori: Compute required sample size

Input: Tail (s) =Two

Effect size dz=0.4486897

α err prob=0.05

Power (1- β err prob)=0.95

Output: Noncentrality parameter δ =3.672683

Critical t=1.996564

Df= 66

Total sample size =67

Actual Power=0.951419

The was calculated by G*Power3.0.10 software.

Inclusion Criteria of Subject:

Normal healthy subjects were included in the study who fulfilled the following criteria, listed below---

1. Age between 17-24 years
2. Subject willing to complete the study
3. Informed written consent.

Exclusion Criteria of Subject:

Subjects having any medical history as stated below or risk causing or at risk (Screening Question) were excluded from the study.

1. History of malignancy or any major surgery.
2. Past or recent history suggesting any cardiovascular or respiratory illness.
3. Skin Disease (Atopic)
4. Asthma, hay fever, sinusitis, emphysema, bronchitis, and any respiratory troubles.
5. Hepatitis, cirrhosis
6. Arthritis, joint pain
7. High blood pressure & any heart troubles.
8. Any major chronic illness or any drug therapy (ATT etc).
9. Subjects with the previous history of yoga.

Hematological Parameters:

Blood Sample Collection: The samples of blood were collected under aseptic conditions at around 09 a.m. 1.2 mg of anhydrous salt E.D.T.A. per ml of blood was used as an anticoagulant. Care was taken to avoid frothing of blood during transfer of blood from syringe to the lab tube.

Examination of RBC, WBC, Platelets, DLC and Hematocrit: RBC, WBC and Platelet examination were performed by Hemocytometer which includes—

a) Improved Neubauer's Counting Chamber (Rohem Disposables Pvt. Ltd.)
b) Cover Slip
c) RBC Pipette (Borosilicate Glass Pvt. Ltd.)
d) WBC Pipette (Borosilicate Glass Pvt. Ltd.)
e) RBC Diluting Fluid (Nice Chemical Pvt. Ltd.)
f) RBC Diluting Fluid (Nice Chemical Pvt. Ltd.)
g) Spirit (U.S. Pharma)

Improved Neubauer's Counting Chamber: It is the name given to a thick glass slide. In the centre of the slide, there is a '*H'*- shaped groove. On the two sides of the central horizontal bar, there are scales for counting the blood cells. The depth of the scale is 1/10 mm or 0.1 mm.

Counting area of Improved Neubauer's Counting Chamber:

- Each scale is 3 mm wide & 3mm long.
- The whole scale is divided into 9 small squares.
- Each square is 1 mm long and 1 mm
- The 04 corner squares are further divided into sixteen small squares and used for WBC counting.
- The central square is subdivided into 25 small squares and each of these smaller squares is further subdivided into 16 smallest squares. RBCs are counted in 05 small squares, 04 of corner and 01 of centre (total 80 smallest squares).

RBC & WBC Pipette:
The pipette for performing the Red Blood Cell count has a red bead in the mixing bulb and the marking above bulb is "101".
The pipette for performing the White Blood Cell count has a white bead in comparatively smaller mixing bulb and the marking above bulb is "11".

Procedure of RBC Counting:

(1) It was ensured that--- all the apparatus was ready with a clean & dry RBC pipette, where the bead is freely movable in the bulb of pipette.
(2) The Improved Neubauer's counting Chamber & cover slip were cleaned & made dust free.
(3) About 2ml of Hayem's fluid was taken in a watch glass.
(4) Bold finger prick was done & the 1st drop of blood was wiped out.
(5) Next drop of blood was sucked in RBC pipette exactly up to 0.5 mark, taking care that there should be no air bubbles.
(6) Any excess amount of blood more than 0.5 mark was removed by tapping the tip of the pipette against the palm of the hand.
(7) Immediately, thereafter the Hayem's fluid was sucked exactly up to the mark of 101.
(8) The pipette was kept horizontally between the palms.
(9) Bend the tube of the pipette & close the other end of the pipette by thumb.
(10) The pipette was gently rolled between the palms for about 1 minute to ensure a thorough mixing of blood & fluid.
(11) The pipette was kept horizontally for 10 minutes, to allow the Hayem's fluid to perform its function.
(12) During these 10 minutes the counting chamber was focused under 10X & the left upper RBC counting small square was brought under the objective. Then the objective lens was turned to 40X & the left Upper (LU) RBC counting Small Square was focused. The position of the condenser & diaphragm during focusing in 10X & 40X was considered.
(13) After 10 minutes, 2-3 drops of fluid were discarded, as the stem of the pipette contained only fluid.
(14) The cover slip was placed over the counting chamber, so that both the platforms are covered.
(15) The pipette is then held at an angle of 45^{o}, to the surface of the counting chamber.
(16) The tube of the pipette was gently pressed to allow a small drop of fluid to come out onto the mouth of the pipette.
(17) The drop was gently brought in contact with the slit between the cover slip & chamber at the edge of cover slip. The fluid was drawn into the chamber by capillary action.
(18) The fluid neither should overflow the chamber (overcharging), nor small enough to fill the chamber insufficiently & trap any air bubble (undercharging).
(19) 2 minutes were allowed for the cells to settle down in the counting chamber, so that, all the cells present will be in same plane.
(20) The counting chamber was placed under the microscope, under 40X.
(21) Under 40X power of microscope the RBCs looks like white-coloured rounded cell with definite border.
(22) The RBCs were counted in 4 small corner Square & 1 small central square.
(23) In order to avoid the counting the same cell twice, any cell which was lying in the upper or left border of square was counted for the particular square & the cell lying on the lower or right border was omitted.

Dilution Factors: blood was filled till 0.5 mark and Hayem's fluid was taken till mark 101. Both was thoroughly mixed and then few drops was discarded which contain the diluting fluid in the stem. Therefor, 01 portion out of 101 was discarded. So, 0.5 part of blood was diluted in 100 parts of fluid or 01 part of blood was mixed in 200 parts of fluid. Thus, Dilution Factor for RBC counting is 200.

RBC Counting:
Area of 05 medium size RBC squares
=5 X 1/5mm X 1/5mm=1/5mm^2
Depth of chamber=1/10mm
Volume of 05 RBC square =1/5mm^2 X 1/10mm
=1/50mm^3
Total no. of RBCs in 05 squares=N
No. of RBCs in 1mm3=N X 50 X 200
=N X 10000mm^3

Procedure of WBC Counting

(1) It was ensured that--- all the apparatus were ready with a clean & dry WBC pipette, where the white bead is freely movable in the bulb of pipette.

(2) The Improved Neubauer's counting Chamber & cover slip, was cleaned & made dust free.
(3) About 2ml of Turk's fluid was taken in a watch glass.
(4) Bold finger prick was done & the 1st drop of blood was wiped out.
(5) The next drop of blood was sucked in WBC pipette exactly up to 0.5 mark, taking care that there should be no air bubbles.
(6) Any excess amount of blood more than 0.5 mark was removed by tapping the tip of the pipette against the palm of the hand.
(7) Immediately, thereafter the Turk's fluid was sucked exactly up to the mark of 11.
(8) The pipette was kept horizontally between the palms.
(9) Bend the tube of the pipette & close the other end of the pipette by thumb.
(10) The pipette was gently rolled between the palms for about 1 minute to ensure a thorough mixing of blood & fluid.
(11) The pipette was kept horizontally for 10 minutes, to allow the Turk's fluid to perform its function.
(12) During these 10 minutes the counting chamber was focused under 10X & the left upper WBC counting small square was brought under the objective. The position of condenser & diaphragm during focusing was considered.
(13) After 10 minutes, 2-3 drops of fluid was discarded, as the stem of the pipette contain only fluid.
(14) The cover slip was placed over the counting chamber, so that both the platforms are covered.
(15) The pipette is then held at an angle of 45°, to the surface of counting chamber.
(16) The tube of the pipette was pressed gently to allow a small drop of fluid to come out on to the mouth of the pipette.
(17) The drop was gently brought in contact with the slit between the cover slip & chamber at the edge of cover slip. The fluid was drawn into the chamber by capillary action.
(18) The fluid neither should overflow the chamber (over charging), nor small enough to fill the chamber insufficiently & trap any air bubble (under charging).
(19) 2 minutes was allowed for the cells to settle down in counting chamber, so that, all the cells present will be in same plane.
(20) The counting chamber was placed under the microscope, under 10X.
(21) Under 10X power of microscope the WBCs look like rounded violet-black dots with a refractility around.
(22) The WBCs were counted in 4 corners Square.
(23) Rules of counting: In order to avoid the counting the same cell twice, any cell which was lying in the upper or left border of square was counted for the particular square & the cell lying on the lower or right border was omitted.

Dilution Factors:
0.5 part of blood was mixed in 10 parts of Turk's fluid, after discarding 3 drops of stem fluid, so, 01 part of blood was mixed with 20 part of fluid. Thus, the dilution factor for WBC counting was 20.

WBC Counting:
Area of 04 WBC square=4 X 1mm X 1mm
= $4mm^2$
Depth of the camber=0.1mm
Volume of fluid in 4 squares =$4mm^2$ X 0.1mm
=$0.4mm^3$
No of WBCs counted in 4 squares=N
Total number of WBCs in = N X Dilution Factor =(20)/0.4
=N X 50

Procedure of Platelet Counting by REES-ECKER method
i. Finger was pricked under aseptic condition.
ii. Blood was sucked in the RBC counting pipette up to 0.5 mark.
iii. Diluting fluid was Sucked up to 101mark.
iv. Was mixed it thoroughly under the palm for 1 min by closing the tip of the pipette with fingertip.
v. 2 – 3 drops of fluid were discarded from pipette.
vi. Cover slip was kept on the Neubauer's counting chamber.
vii. Inner side of a petri dish was coated with filter paper soaked in water.
viii. Chamber was charged.
ix. Chamber was kept for 15 min under the cover of petri dish.
x. The RBC counting area of the chamber was focused under the 40X objective of the microscope.
xi. Under the microscope plates had appeared as ***refractile bodies,*** surrounded by light blue-coloured solution.
xii. The number of platelets present in all the 25 boxes of RBC counting area & all the 16 small boxes of each of the 25 boxes were counted.

Determination of Hematocrit:
The volume of cellular elements per unit volume of whole blood, which is expressed as percentage is called as packed cell volume or PCV or Hematocrit.

Apparatus- Wintrobe's Hematocrit tube (Borosilicate Glass Pvt. Ltd.**)**: it is a glass tube with uniform bore of 2 mm & length of 11 cm. The tube is marked as 10 to 0 cm from above down on one side & 0 to 10 cm on another side.

Procedure: The blood samples were taken in Wintrobe's Hematocrit tube upto10 or 0 mark at top. The tube was centrifuged in a centrifuge machine (Navyug India) for 30 minutes in 3000 RPM. the RBCs have the greater mass & was forced to the bottom of the tube. The WBCs & platelets will form a thin layer between the RBCs and Plasma, called Buffy coat & the liquid plasma will rise to the top. The height of Red Cell column was measured as a '%' of total blood column from the bottom of the tube.

STATISTICAL ANALYSIS:
The statistical evaluation of this study was be done by using the software SPSS (Software Package of Social Studies), designed by the TISS (Tata Institute of Social Studies).

RESULTS:

Control Group = 75 subjects examine 40 days before examination and during examination with no Yogic Exercise.

Study Group = 75 subjects examine 40 days before examination and during examination after 40 days Yogic Exercise.

Table 3: Mean and SD of Hematological Parameters 40 Days Before Examination and During Examination

Parameters	Group		p value
	Study (n = 75)	Control (n = 75)	
TLC (/cu.mm) (40 Days Before Examination)	8620.00 ± 544.26	8901.33 ± 625.90	0.003
TLC (/cu.mm) (During Examination)	9186.67 ± 377.88	8540.00 ± 582.46	<0.001
RBC Count (Million/cu.mm) (40 Days Before Examination)	5.20 ± 0.30	5.19 ± 0.33	0.871
RBC Count (Million/cu.mm) (During Examination)	5.42 ± 0.29	4.96 ± 0.36	<0.001
Platelet Count (Lacs/cu.mm) (Before Examination)	2.66 ± 0.41	2.62 ± 0.45	0.693
Platelet Count (Lacs/cu.mm) (During Examination)	2.70 ± 0.42	3.18 ± 0.48	<0.001
Hematocrit (%) (40 Days Before Examination)	43.48 ± 1.40	43.45 ± 1.53	0.995
Hematocrit (%) (During Examination)	45.69 ± 1.52	41.11 ± 1.09	<0.001

Table 6: Comparison of the two Groups in Terms of change in TLC (/cu.mm) over time (n = 150)

TLC (/cu.mm)	Group		P value for comparison of the two groups at each of the timepoints (Wilcoxon-Mann-Whitney Test)
	Study	Control	
	Mean (SD)	Mean (SD)	
Before Examination	8620.00 (544.26)	8901.33 (625.90)	0.003
After Examination	9186.67 (377.88)	8540.00 (582.46)	<0.001
P Value for change in TLC (/cu.mm) over time within each group (Wilcoxon Test)	<0.001	<0.001	
Overall P Value for comparison of change in TLC (/cu.mm) over time between the two groups (Generalized Estimating Equations)	<0.001		

In Group: Study, the mean TLC (/cu.mm) increased from a minimum of 8620.00 at the Before Examination timepoint to a maximum of 9186.67 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 0.0, p = <0.001).

In Group: Control, the mean TLC (/cu.mm) decreased from a maximum of 8901.33 at the Before Examination timepoint to a minimum of 8540.00 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 2850.0, p = <0.001).

The overall change in TLC (/cu.mm) over time was compared in the two groups using the Generalized Estimating Equations method. There was a significant difference in the trend of TLC (/cu.mm) over time between the two groups (p = <0.001).

Table 7: Comparison of the two Groups in Terms of change in RBC Count (Million/cu.mm) over time (n = 150)

RBC Count (Million/cu.mm)	Group		P value for comparison of the two groups at each of the timepoints (Wilcoxon-Mann-Whitney Test)
	Study	Control	
	Mean (SD)	Mean (SD)	
Before Examination	5.20 (0.30)	5.19 (0.33)	0.871
After Examination	5.42 (0.29)	4.96 (0.36)	<0.001
P Value for change in RBC Count (Million/cu.mm) over time within each group (Wilcoxon Test)	<0.001	<0.001	

RBC Count (Million/cu.mm)	Group		P value for comparison of the two groups at each of the timepoints (Wilcoxon-Mann-Whitney Test)
	Study	Control	
	Mean (SD)	Mean (SD)	
Overall P Value for comparison of change in RBC Count (Million/cu.mm) over time between the two groups (Generalized Estimating Equations)	<0.001		

In Group: Study, the mean RBC Count (Million/cu.mm) increased from a minimum of 5.20 at the Before Examination timepoint to a maximum of 5.42 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 0.0, p = <0.001).
In Group: Control, the mean RBC Count (Million/cu.mm) decreased from a maximum of 5.19 at the Before Examination timepoint to a minimum of 4.96 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 2775.0, p = <0.001).
The overall change in RBC Count (Million/cu.mm) over time was compared in the two groups using the Generalized Estimating Equations method. There was a significant difference in the trend of RBC Count (Million/cu.mm) over time between the two groups (p = <0.001).

Table 8: Comparison of the two Groups in Terms of change in Platelet Count (Lacs/cu.mm) over time (n = 150)

Platelet Count (Lacs/cu.mm)	Group		P value for comparison of the two groups at each of the timepoints (Wilcoxon-Mann-Whitney Test)
	Study	Control	
	Mean (SD)	Mean (SD)	
Before Examination	2.66 (0.41)	2.62 (0.45)	0.693
After Examination	2.70 (0.42)	3.18 (0.48)	<0.001
P Value for change in Platelet Count (Lacs/cu.mm) over time within each group (Wilcoxon Test)	0.736	<0.001	
Overall P Value for comparison of change in Platelet Count (Lacs/cu.mm) over time between the two groups (Generalized Estimating Equations)	<0.001		

In Group: Study, the mean Platelet Count (Lacs/cu.mm) increased from a minimum of 2.66 at the Before Examination timepoint to a maximum of 2.70 at the After Examination timepoint. This change was not statistically significant (Wilcoxon Test: V = 1219.0, p = 0.736).
In Group: Control, the mean Platelet Count (Lacs/cu.mm) increased from a minimum of 2.62 at the Before Examination timepoint to a maximum of 3.18 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 84.0, p = <0.001).
The overall change in Platelet Count (Lacs/cu.mm) over time was compared in the two groups using the Generalized Estimating Equations method. There was a significant difference in the trend of Platelet Count (Lacs/cu.mm) over time between the two groups (p = <0.001).

Table 9: Comparison of the two Groups in Terms of change in Hematocrit (%) over time (n = 150)

Hematocrit (%)	Group		P value for comparison of the two groups at each of the timepoints (Wilcoxon-Mann-Whitney Test)
	Study	Control	
	Mean (SD)	Mean (SD)	
Before Examination	43.48 (1.40)	43.45 (1.53)	0.995
After Examination	45.69 (1.52)	41.11 (1.09)	<0.001

Hematocrit (%)	Group		P value for comparison of the two groups at each of the timepoints (Wilcoxon-Mann-Whitney Test)
	Study	Control	
	Mean (SD)	Mean (SD)	
P Value for change in Hematocrit (%) over time within each group (Wilcoxon Test)	<0.001	<0.001	
Overall P Value for comparison of change in Hematocrit (%) over time between the two groups (Generalized Estimating Equations)	<0.001		

In Group: Study, the mean Hematocrit (%) increased from a minimum of 43.48 at the Before Examination timepoint to a maximum of 45.69 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 0.0, p = <0.001).

In Group: Control, the mean Hematocrit (%) decreased from a maximum of 43.45 at the Before Examination timepoint to a minimum of 41.11 at the After Examination timepoint. This change was statistically significant (Wilcoxon Test: V = 2695.0, p = <0.001).

The overall change in Hematocrit (%) over time was compared in the two groups using the Generalized Estimating Equations method. There was a significant difference in the trend of Hematocrit (%) over time between the two groups (p = <0.001).

DISCUSSION:

In this study the TLC decreases upon exposure to stress in control group medical students, but it increases in Study group. The examination stress in medical students comes under the category of chronic stress.[6] This chronic stress affect both the cell mediated and humoral immunity via secretion of glucocorticoids.[7]Glucocorticoid offer resistance against any mental or physical stress, by synthesis of new protein, supply more energy during stress by releasing fatty acid, prevent the severity of other changes of body, caused by stress.[8] This Glucocorticoid decreases the TLC, by decreasing the count of eosinophil, basophil and lymphocyte.[6] The yogic exercise defends this stress induced decrease of TLC and increases the TLC, which could be due to recruitment of cell from bone marrow and increase in the level of CXCL1/interleukin (IL)-8 and eotaxin/CCL11. Increase in the chemokine CXCL1/interleukin (IL)-8 could explain the higher number of WBC, in terms of neutrophils mainly. On the other hand increase in eotaxin/CCL11 is responsible for higher number of WBC, in terms of recruitment of eosinophil in the circulation.[9]

In this study the TRBC decreases upon exposure to stress in control group medical students, but it increases in Study group. Stress decreases the TRBC count by decreasing the process of erythropoiesis, which in turn due to decrease in serum iron levels and bone marrow iron levels.[10] The effect of yogic exercise may be explained as the increase in vit B_{12} via increasing Castle's Intrinsic Factor, which helps in absorption of vit B_{12} and thus helps in final maturation of RBCs.[11]

In this study the platelet count increases in Control subjects due to the effect of examination stress. In the case of increased stress and anxiety, serotonin binds to 5-HT-2 receptors on platelets and mediates the release of factors that promote platelet aggregation.[12] As the yogic exercise opposes this adverse effect of stress, thus the platelet count remains same in the Study subjects after 40 days yogic exercise.

In this study the haematocrit value decreases in control group subjects due to examination stress whereas it increases in Study subjects due to yoga exercise, which can be due to increase in RBC and WBC count, that already has been explained above.On view of the above discussions yoga classes can be offered as a strategy to help health professionals to reduced their work-related stress.

CONCLUSION:

Here we concluded that the practice of yogic asanas and pranayama not only reduces these adverse effects of examination stress, but also produces beneficiary effects on hematological parameters, that will help the medical students to perform better in examination.

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