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Original Research Article

A Comparative Study of Hemoglobin Level and Platelet Count: A Case Study on Sangli and Kolhapur District of Maharashtra State

Dr. Prakash Rajaram Chavan[1], Mr. Ramesh Dilip Shinde[2*]

[1]Head and Associate Professor, Department of Statistics, Smt. Kasturbai Walchand College of Arts & Science, Sangli, Maharashtra, India.
[2]Assistant Professor, Department of Statistics, Jaysingpur College, Jaysingpur Maharashtra, India.

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Abstract: The goal of present research was to study the average Hemoglobin level of women's and men in Sangli district. We study the average Platelet count of women's in same two district. We study the correlation coefficient between Hemoglobin and Platelet count of women and men of the same district. We also use the proportion test for hemoglobin level and platelet count of the same two districts.

Keywords: Hemoglobin level, Platelet count, Correlation coefficient, Proportion test.

1. INTRODUCTION

Good victual habits always give us healthy welfare. But in this scurried world people ignore their health. Due to change in lifestyle and food style we give invitation to many diseases. Body need iron to make a protein called as "Hemoglobin" which is responsible for carrying oxygen to our body tissues and it helps to our tissues, muscles to function effectively. Due to abnormal or low Hemoglobin, the cells in our body will not get enough oxygen. Low Hemoglobin i.e. iron deficiency can cause us to feel tired and extremely low iron levels may cause damage to organs. According to the American Society of Hematology (ASH), there are many problems caused by low Hemoglobin. Such as rapid or irregular heartbeat, pregnancy complications, delayed growth in infants and children etc. Abnormal or low Hemoglobin is not a big disease. Platelets are tiny but important cells in our blood that help your body control bleeding. A Platelet Count is a lab test to measure how many platelets you have in your blood. Platelets are parts of blood that helps the blood clot. They are smaller than red or white blood cells. Platelet are being destroyed in the Liver and Bloodstream, etc. "Drugs, medicines, cancertreatment such as chemotherapy are common causes autoimmune disorders, which the immune system mistakenly attacks and destroys healthy body tissue, such as platelets. A low platelet count might be a sign of certain Cancer or infections a high platelet count can put you at risk. Harmful blood clot of stoke.

2. Objectives of the Study:

- To Study Hemoglobin level in Women's & Men's blood in Kolhapur & Sangli district.
- To study Platelet Count in Women's & Men's blood in Kolhapur & Sangli district.
- To check the relationship between Hemoglobin level and platelet count of women's in Kolhapur and Sangli districts.
- To check the relationship between Hemoglobin level and Platelet count of men's in Kolhapur & Sangli districts.
- To represent the various objects using graphical method.

3. Methods and Material:

The research was carried out using laboratory reports. A total number of 500 blood samples were collected from male and female. Ethical clearance was taken from various labs in Kolhapur &Sangli districts. Informed consent was taken from subjects and procedure was explained to subjects. 2 ml of blood was collected under all aseptic precaution from each subject with help of sterile syringe and needle. Venous blood sample was collected by venepuncture technique. The sample

***Corresponding Author:** Mr. Ramesh Dilip Shinde
Assistant Professor, Department of Statistics, Jaysingpur College, Jaysingpur Maharashtra, India

collected was transferred to EDTA anticoagulant bulb for hemoglobin level and platelet count. Hemoglobin level and platelet count was done by using automated cell counter machine using standard protocol.

4. Statistical Analysis:

1. Mean a) Kolhapur 1) Womens –

Hb-range	No. of Womens (fi)	Mid-point (mi)	(fi mi)
6 – 7	2	6.5	13
7 – 8	0	7.5	0
8 – 9	9	8.5	76.5
9 – 10	13	9.5	123.5
10 – 11	25	10.5	262.5
11 – 12	30	11.5	345
12 – 13	28	12.5	350
13 – 14	13	13.5	175.5
14 – 15	4	14.5	58
15 – 16	1	15.5	15.5
Total	=125		=1423.5

Mean = 11.38 The Mean HB of Kolhapur Women's is 11.388 gm

2) Mens -

Hb-range	No. of Mens (fi)	Mid-point (mi)	(fi mi)
4 – 5	1	4.5	4.5
5 – 6	0	5.5	0
6 – 7	3	6.5	19.5
7 – 8	1	7.5	7.5
8 – 9	3	8.5	25.5
9 – 10	8	9.5	76
10 – 11	9	10.5	94.5
11 – 12	12	11.5	138
12 – 13	15	12.5	187.5
13 - 14	25	13.5	337.5
14 – 15	22	14.5	319
15 – 16	19	15.5	294.5
16 - 17	3	16.5	49.5
17 - 18	4	17.5	70
Total	=125		=1623.5

Mean = 12.988 The Mean HB of Kolhapur Men's is 12.988 gm

Sangli 1) Womens –

Hb-range	No. of Womens (fi)	Mid-point (mi)	(fi mi)
5 – 6	1	5.5	5.5
6 – 7	2	6.5	13
7 – 8	7	7.5	52.5
8 – 9	8	8.5	68
9 – 10	14	9.5	133
10 – 11	23	10.5	241.5
11 – 12	37	11.5	425.5
12 – 13	19	12.5	237.5
13 - 14	10	13.5	135
14 – 15	3	14.5	43.5
15 - 16	0	15.5	0
16 – 17	0	16.5	0
17 - 18	0	17.5	0
18 - 19	1	18.5	18.5
Total	=125		=1373.5

Mean = 10.988 The Mean HB of Sangli Women's is 10.988 gm

2) Mens –

Hb-range	No. of Mens (fi)	Mid-point (mi)	(fi mi)
5 - 6	1	5.5	5.5
6 – 7	2	6.5	13
7 – 8	0	7.5	0
8 – 9	2	8.5	17
9 – 10	12	9.5	114
10 – 11	4	10.5	42
11 – 12	15	11.5	172.5
12 – 13	23	12.5	287.5
13 - 14	24	13.5	324
14 – 15	31	14.5	449.5
15 - 16	8	15.5	124
16 - 17	1	16.5	16.5
17 - 18	1	17.5	17.5
18 - 19	1	18.5	18.5
Total	=125		=1601.5

Mean = 12.812 The Mean HB of Sangli Men's is 12.812 gm

c) Combine Mean 1) Womens –

Hb-range	No. of Womens (fi)	Mid-point (mi)	(fi mi)
5 - 6	1	5.5	5.5
6 – 7	4	6.5	26
7 – 8	7	7.5	52.5
8 – 9	17	8.5	144.5
9 – 10	27	9.5	256.5
10 – 11	48	10.5	504
11 – 12	67	11.5	770.5
12 – 13	47	12.5	587.5
13 - 14	23	13.5	310.5
14 – 15	7	14.5	101.5
15 - 16	1	15.5	15.5
16 - 17	0	16.5	0
17 - 18	0	17.5	0
18 - 19	1	18.5	18.5
Total	=250		=2793

Mean = 11.172 The Combine Mean HB of Women's is 11.172 gm

2) Mens –

Hb-range	No. of Mens (fi)	Mid-point (mi)	(fi mi)
4 – 5	2	4.5	9
5 – 6	0	5.5	0
6 – 7	5	6.5	32.5
7 – 8	1	7.5	7.5
8 – 9	5	8.5	42.5
9 – 10	20	9.5	190
10 – 11	13	10.5	136.5
11 – 12	27	11.5	310.5
12 – 13	38	12.5	475
13 - 14	49	13.5	661.5
14 – 15	53	14.5	768.5
15 - 16	27	15.5	418.5
16 - 17	4	16.5	66
17 – 18	5	17.5	87.5
18 – 19	1	18.5	18.5
Total	=250		=3224

Mean = 12.896 The Combine Mean HB of Men's is 12.896 gm

d) Kolhapur 1) Womens –

Platelet -range	**No. of Womens (fi)**	**Mid-point (mi)**	**(fi mi)**
0 – 50000	0	25000	0
50000 – 100000	5	75000	375000
100000 – 150000	18	125000	2250000
150000 – 200000	14	175000	2450000
200000 – 250000	18	225000	4050000
250000 – 300000	29	275000	7975000
300000 – 350000	21	325000	6825000
350000 – 400000	11	375000	4125000
400000 – 450000	5	425000	2125000
450000 - 500000	3	475000	1425000
500000 - 550000	1	525000	525000
Total	=125		=34825000

Mean = 278600 The Mean Platelet Count of Kolhapur Women's is 278600 gm

2) Mens –

Platelet -range	**No. of Mens (fi)**	**Mid-point (mi)**	**(fi mi)**
0 – 50000	2	25000	50000
50000 – 100000	6	75000	45000
100000 – 150000	32	125000	4000000
150000 – 200000	42	175000	7350000
200000 – 250000	18	225000	4050000
250000 – 300000	10	275000	2750000
300000 – 350000	8	325000	2600000
350000 – 400000	4	375000	1500000
400000 – 450000	1	425000	425000
450000 - 500000	1	475000	475000
500000 - 550000	0	525000	0
550000 - 600000	0	575000	0
600000 - 650000	1	625000	625000
Total	=125		=23870000

Mean = 190960 The Mean Platelet Count of Kolhapur Men's is 190960 gm

e) Sangli 1) Womens –

Platelet -range	**No. of Womens (fi)**	**Mid-point (mi)**	**(fi mi)**
0 – 50000	9	25000	225000
50000 – 100000	3	75000	225000
100000 – 150000	5	125000	625000
150000 – 200000	10	175000	1750000
200000 – 250000	37	225000	8325000
250000 – 300000	25	275000	6875000
300000 – 350000	11	325000	3575000
350000 – 400000	12	375000	4500000
400000 – 450000	9	425000	3825000
450000 - 500000	0	475000	0
500000 - 550000	1	525000	525000
550000 - 600000	2	575000	1150000
600000 - 650000	1	625000	625000
Total	=125		=32225000

Mean = 257800 The Mean Platelet Count of Sangli Women's is 257800 gm

2) Mens –

Platelet -range	No. of Mens (fi)	Mid-point (mi)	(fi mi)
0 – 50000	7	25000	175000
50000 – 100000	5	75000	375000
100000 – 150000	16	125000	2000000
150000 – 200000	22	175000	3850000
200000 – 250000	32	225000	7200000
250000 – 300000	27	275000	7425000
300000 – 350000	7	325000	2275000
350000 – 400000	8	375000	3000000
400000 – 450000	1	425000	425000
Total	=125		=26725000

Mean =2138000 The Mean Platelet Count of Sangli Men's is 2138000 gm

f) Combine Mean 1) Womens –

Platelet -range	No. of Womens (fi)	Mid-point (mi)	(fi mi)
0 – 50000	9	25000	225000
50000 – 100000	8	75000	600000
100000 – 150000	23	125000	2875000
150000 – 200000	24	175000	4200000
200000 – 250000	55	225000	12375000
250000 – 300000	54	275000	14850000
300000 – 350000	32	325000	10400000
350000 – 400000	23	375000	9775000
400000 – 450000	14	425000	5950000
450000 - 500000	3	475000	1425000
500000 - 550000	2	525000	1050000
550000 - 600000	2	575000	1150000
600000 - 650000	1	625000	625000
Total	=250		=65500000

Mean =262000 The Combine Mean Platelet Count of Women's is 262000 gm

2) Mens –

Platelet -range	No. of Mens (fi)	Mid-point (mi)	(fi mi)
0 – 50000	9	25000	225000
50000 – 100000	11	75000	825000
100000 – 150000	48	125000	6000000
150000 – 200000	64	175000	11200000
200000 – 250000	50	225000	11250000
250000 – 300000	37	275000	10175000
300000 – 350000	13	325000	4025000
350000 – 400000	14	375000	5250000
400000 – 450000	2	425000	850000
450000 - 500000	1	475000	475000
500000 - 550000	0	525000	0
550000 - 600000	0	575000	0
600000 - 650000	1	625000	625000
Total	=250		=50900000

Mean = 203600 The Combine Mean Platelet Count of Men's is 203600 gm

2. Correlation:

a) HEMOGLOBIN & PLATELET COUNT OF KOLHAPUR FEMALE

Let X be a Hemoglobin of Kolhapur Female Let Y be a Platelet Count of Kolhapur Female

The Karl Pearson's correlation coefficient between Hemoglobin and Platelet count of Kolhapur women's is -0.2259.

Conclusion: The correlation coefficient between Hemoglobin level and Platelet count of women's in Kolhapur district is negatively correlated.

b) HEMOGLOBIN & PLATELET COUNT OF KOLHAPUR MALE
Let X be a Hemoglobin of Kolhapur Male Let Y be a Platelet Count of Kolhapur Male

The Karl Pearson's correlation coefficient between Hemoglobin and Platelet count of Kolhapur men's is -0.1041.

Conclusion: The correlation coefficient between Hemoglobin level and Platelet count of men's inKolhapur district is negatively correlated.

c) HEMOGLOBIN & PLATELET COUNT OF SANGLI FEMALE
Let X be a Hemoglobin of Sangli Female Let Y be a Platelet Count of Sangli Female

The Karl Pearson's correlation coefficient between Hemoglobin and Platelet count of Sangli women's is-0.0852.

Conclusion: The correlation coefficient between Hemoglobin level and Platelet count of women's in Kolhapur district is negatively correlated.

d) HEMOGLOBIN & PLATELET COUNT OF SANGLI MALE
Let X be a Hemoglobin of Sangli Male Let Y be a Platelet Count of Sangli Male

The Karl Pearson's correlation coefficient between Hemoglobin and Platelet count of Sangli men's is -0.1979.

Conclusion: The correlation coefficient between Hemoglobin level and Platelet count of women's in Kolhapur district is negatively correlated

5. Over all Conclusions:

- The average Hemoglobin level of women's in Sangli district is less than Kolhapur district.
- The average Hemoglobin level of men's in Sangli district is less than Kolhapur district.
- The average Platelet count of women's in Sangli district is less than Kolhapur district.
- The average platelet count of men's in Sangli district is less than Kolhapur district.
- The correlation coefficient between Hemoglobin and Platelet count of women's in Kolhapur is negatively correlated.
- The correlation coefficient between Hemoglobin and Platelet count of men's in Kolhapur is negatively correlated.
- The correlation coefficient between Hemoglobin and Platelet count of women's in Sangli is negatively correlated.
- The correlation coefficient between Hemoglobin and Platelet count of men's in Sangli is negatively correlated.
- From Proportion test we conclude that more than 85% of females from Kolhapur district have not normal Hemoglobin level.
- From Proportion test we conclude that more than 85% of females from Sangli district have not normal Hemoglobin level.

6. Limitations of case study:

The limitations of our project are as follows:

1. The research is limited to Sangli and Kolhapur district only.
2. The time and sample constraints were major problems.
3. In our paper we take a small sample of patients, so we can't say these results are true for all patients.

7. Limitations of case study:

1. A well planned study can be taken for other blood and platelet related health issues etc.
2. It can be extended for other districts in Maharashtra for better estimation of human health.

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