

Analysis of Reasons for Temporary Deferrals in Blood Camps among Various Professionals

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Abstract: Donor selection is an important factor which determines the quality of blood. Temporary deferrals in blood camp among various professionals have become one of the leading causes of blood donor rejections and are an equivalent risk factor compared to permanent rejections. Whole blood donor deferrals lead to loss of precious blood donors and blood units available for transfusion purposes¹. This is mainly attributed to the high prevalence of unawareness among various professions, poor and unhealthy lifestyle, work stress and lack of physical activity that can cause blood pressure and cardiac problems. Our study aims to compare the deferral pattern among various professions such as college students, Bank workers, IT professionals, Corporate workers, Police and Politicians. Blood pressure problems are the leading cause of temporary deferrals followed by low hemoglobin level. Deferrals due to inadequate sleep and inadequate breakfast can be minimized by conducting prior awareness programs so that the level of healthy donors can be increased. Increased public education on common causes of donor deferral may also lower deferral rates by allowing prospective donors to "pre-screen" themselves.¹⁰

Henceforth the above study shows that abnormal blood pressure is the leading problem among donors and many other deferral reasons can be reduced by healthy lifestyle modifications and prior awareness programs.

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I. Introduction

Blood is a living tissue that is transfused into another human body and hence blood safety is a major issue in transfusion medicine⁴. Blood donor programs are vital to any transfusion service. The objective of donor screening is to minimize the possibility of transmitting infectious agents to recipients and then to ensure the wellbeing of donor, as well⁵. The minimum needed to meet a nation's basic requirement for blood is approximately about 1% of the population (10 per 1000 population)¹. According to National AIDS Control Organization's statistics, the annual rate of blood donation is about 7.4 million units against the requirement of 10 million units in India^{1, 2, 9}. The primary responsibility of a blood transfusion service is to provide a safe, sufficient and timely supply of blood and blood products. Significant variations have been observed between places in the extent to which national donor selection criteria are defined, prospective donors are assessed and the quality and effectiveness of the donor selection process are monitored. In some countries, national systems of blood donor selection are not well-developed and donor selection criteria are not clearly defined or applied uniformly. This may result in blood being collected from donors who have not been properly assessed for their suitability to donate. This may affect their health and pose a higher risk of transmission of infections through transfusion. The transfusion services have a process of donor selection based on criteria of subjecting donors to a questionnaire, physical examination, and hemoglobin testing before blood donation, and only those who meet the requirements qualify as blood donors. Blood donor suitability criteria are based on science, informed medical opinion and regulatory rules are designed to protect both the blood donors and blood recipients from harm. About one third of the motivated blood donors are deferred due to stringent screening criteria, either temporarily or permanently³. The criteria for prospective blood donor selection and deferral in India are provided by the Drugs and Cosmetic Act 1940 supplemented by the Standards for Blood Banks and Blood Transfusion Services. This study was undertaken to evaluate and analyze the blood donor deferral pattern and causes for deferral of blood donors in various camps conducted in various professionals. Students, most of whom are young, hold the key to increasing the size of the donor pool for decades to come, and appropriate management of blood donation-related issues will likely play a tremendous role in the sustainability of blood supply⁶. A strict process of donor selection aimed at assessing the suitability of prospective donors is conducted for ensuring the safety and sufficiency of blood supply, safeguard the health of the donors and recipients of blood transfusion.

II. Justification

Large numbers of healthy donors are deferred due to various reasons. They are the potential motivated donors that the society is losing. Hence, it is very important to analyze the reasons for deferrals. The donors who were deferred could be guided to improve for future donation. The pattern of donor deferral is identified as an important tool for blood safety and also provides key areas to focus for donor selection.

III. Iii. Aims And Objectives

1. To evaluate and analyze the temporary blood donor deferral pattern among
 - College students
 - IT professionals
 - Corporate workers
 - Police
 - Politicians
 - Bank Workers
2. To compare the deferral pattern among male and female donors.
3. To compare the deferral pattern among the students and workers.

IV. Methodology

The present retrospective study was carried out for whole blood donors at Department of Transfusion Medicine, Coimbatore Medical College Hospital, Coimbatore over a period of 6 months (July 2017 to December 2017). This study included both the voluntary donors and blood donation camp conducted among various professionals. Pre-donor screening tests like donor questionnaire followed by physical examination & Hemoglobin estimation by Copper Sulphate (finger prick test) method with cut off value of 12.5 gram/deciliter were done. Donors with normal Blood Pressure were accepted for blood donation. First time and repeat donors were not segregated and for the sake of analysis, all repeat presentations were considered as independent attempts for blood donation. Data retrieved from records have been tabulated, analyzed and compared with similar studies. Analysis was done to find significant differences among different professionals.

This retrospective study of 1166 (out of 3034 people who came to various camps) rejected people from 33 camps of different professions is tabulated and studied in various graphs.

STUDY SETTING- DEPARTMENT OF TRANSFUSION MEDICINE, COIMBATORE MEDICAL COLLEGE HOSPITAL, COIMBATORE.

STUDY PEOPLE:

- 1) College Students (19 camps from various colleges)
- 2) IT professionals (1 camp)
- 3) Police (1 camp)
- 4) Political Party (2 camps)
- 5) Bank workers (4 camps from different banks)
- 6) Corporate Workers (6 camps from different companies)

SAMPLE SIZE- 1166

STUDY DESIGN - Retrospective study

STUDY MATERIAL: Rejected blood donation forms and from different camps held by COIMBATORE MEDICAL COLLEGE HOSPITAL.

STUDY DURATION – 6 months (July 2017 – December 2017)

A DONOR QUESTIONNAIRE (DATA FORM FROM THE BLOOD BANK) was given to the people who attended the camps.

SUBJECT SELECTION: Donors who were rejected due to various reasons in blood camps.

DONOR QUESTIONNAIRE

1) Are you a Diabetic patient (நீங்கள் ஒரு நீரிழிவு நோயாளியாக இருக்கிறீர்களா?)	(Yes/No) (ஆம்/இல்லை)
2) Are you an Asthmatic? (ஆஸ்துமா நோயாளியா?)	(Yes/No) (ஆம்/இல்லை)
3) Are you a heart patient? (இருதய நோயாளியா?)	(Yes/No) (ஆம்/இல்லை)
4) Have you been affected by tuberculosis? (எப்போதாவது காசநோய் தாக்கியுள்ளதா?)	(Yes/No) (ஆம்/இல்லை)
5) Typhoid/Malaria in the past 1 year? (கடந்த ஒரு வருடத்தில் டைபாய்டு/மலேரியா காய்ச்சல் தாக்கியுள்ளதா?)	(Yes/No) (ஆம்/இல்லை)
6) Have you had jaundice in the past 1 year? (கடந்த ஒரு ஆண்டில் மஞ்சள் காமாலை நோய் வந்துள்ளதா?)	(Yes/No) (ஆம்/இல்லை)
7) Are you taking any medication now? (தற்போது ஏதும் மருந்து உட்கொள்கிறீர்களா?)	(Yes/No) (ஆம்/இல்லை)
8) Did you take any antibiotics in the past 24 hours? (கடந்த 24 மணிநேரத்தில் நோய் தீர்ப்பு மருந்து உட்கொண்டீர்களா?)	(Yes/No) (ஆம்/இல்லை)
10) Have you had tooth extraction in the past 3 weeks? (கடந்த 3 வாரங்களில் பல் பிடுங்கினீர்களா? சிகிச்சை செய்து உள்ளீர்களா?)	(Yes/No) (ஆம்/ இல்லை)
12) Have you had any blood/blood component as transfusion/tattoo in the last 1 year? (குங்களுக்கு இரத்தமோ/இரத்தப்பொருட்களோ எப்போதாவது செலுத்தப்பட்டதா? பச்சை குத்தப்பட்டதா?)	(Yes/No) (ஆம்/இல்லை)
13) Do you have epilepsy? (காக்காய் வலிப்பு வந்ததா?)	(Yes/No) (ஆம்/இல்லை)
14) Any reaction during previous blood donation? (இதற்கு முன் இரத்ததானம் அளித்தபோது பின்விளைவு ஏற்பட்டதா?)	(Yes/No) (ஆம்/இல்லை)
15) Ladies only - Are you pregnant?/Are you lactating? (தூங்கள் கர்ப்பினியா? பாலூட்டும் தாயா?)	(Yes/No) (ஆம்/இல்லை)

INCLUSION CRITERIA

People who were unfit for various reasons in blood camps.

The reasons are

1. Inadequate Breakfast
2. Inadequate Sleep
3. Previous donation less than 3 months
4. Inadequate Hemoglobin
5. Surgery less than 1 year
6. Recent infections
7. Recent medication
8. Abnormal Blood Pressure (hypotension and hypertension)
9. Abnormal Body Mass Index (overweight and underweight)

10. Irregular Menstruation
11. Last Menstrual Phase less than 10 days
12. Cardiac problems like Tachycardia , Bradycardia and Murmurs
13. Other reasons like Alcohol and Smoking in less than 24 hours andTattooing

EXCLUSION CRITERIA

1. People who were fit to donate blood.

V. Results

TABLE NO.1 shows the number of donors participated in camps, eligible and not eligible donors.

PROFESSIONS	FIT	FIT %	UNFIT	UNFIT %	TOTAL
COLLEGE STUDENTS	1221	62.23	741	37.77	1962
BANK WORKERS	80	62.5	48	37.5	128
IT PROFESSIONALS	107	56.02	84	43.98	191
CORPORATE WORKERS	202	63.12	118	36.88	320
POLITICAL PARTY	202	61.21	128	38.79	330
POLICE	56	54.36	47	45.64	103

Table no.1 shows the number of people participated in camps. Fit people were allowed to donate blood. Unfit people were temporarily deferred.3034 attended camps between July 2017 to July 2018.1166 were rejected for various reasons given in table no.2.Police showed the least fit percentage and the main reason for their deferral was lack of adequate sleep. Corporate workers showed the maximum fit percentage (63.12%), followed by bank workers (62.5%) and college students (62.23%).

TABLE NO.2 shows the number of unfit people in various categories from various professions.

PROFESSIONS	VARIATION IN BP	LOW Hb	INADEQUATE SLEEP	ABNORMAL BMI	PREVIOUS INFECTIONS AND MEDICATIONS	INADEQUATE BREAKFAST	OTHERS	LMP <10 DAYS	CARDIAC PROBLEMS	IRREGULAR MENSTRUATION	PREVIOUS DONATION	TOTAL
COLLEGE STUDENTS	152	174	77	131	79	37	17	30	13	24	7	741
BANK WORKERS	21	8	6	1	7	2	0	0	3	0	0	48
IT PROFESSIONALS	16	18	15	8	3	7	5	8	2	2	0	84
CORPORATE WORKERS	29	5	30	5	16	7	12	2	10	0	2	118
POLITICAL PARTY	26	18	21	11	25	5	13	1	4	1	3	128
POLICE	10	9	16	0	3	0	3	1	4	1	0	47
TOTAL	254	232	165	156	133	58	50	42	36	28	12	1166
PERCENTAGE	21.78	19.9	14.16	13.38	11.42	4.97	4.29	3.6	3.08	2.4	1.02	

Table no.2 shows the reasons for temporary deferrals among various professions. Disparity in blood pressure (21.78%) is the most common reason for rejection. Majority of the unfit people in this category showed an Increase in blood pressure. They were checked again after a break of 10 minutes to rule out anxiety. Inadequate Hemoglobin (19.9%) is the second common explanation for rejection. It was tested by Copper Sulphate Test. Adequate sleep is designated as a minimum sleep of 8 hours prior to transfusion. Inadequate sleep (14.16%) is the next common reason. Overweight and underweight people (13.38%) were also rejected and it constitutes the next major reason.

CHART NO.1 shows the percentage of various reasons of temporary deferrals.

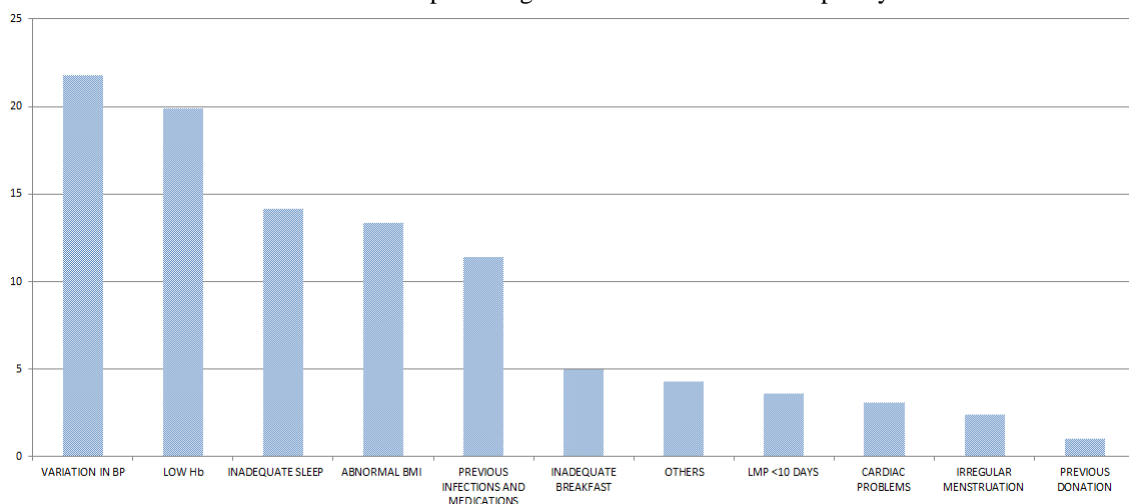
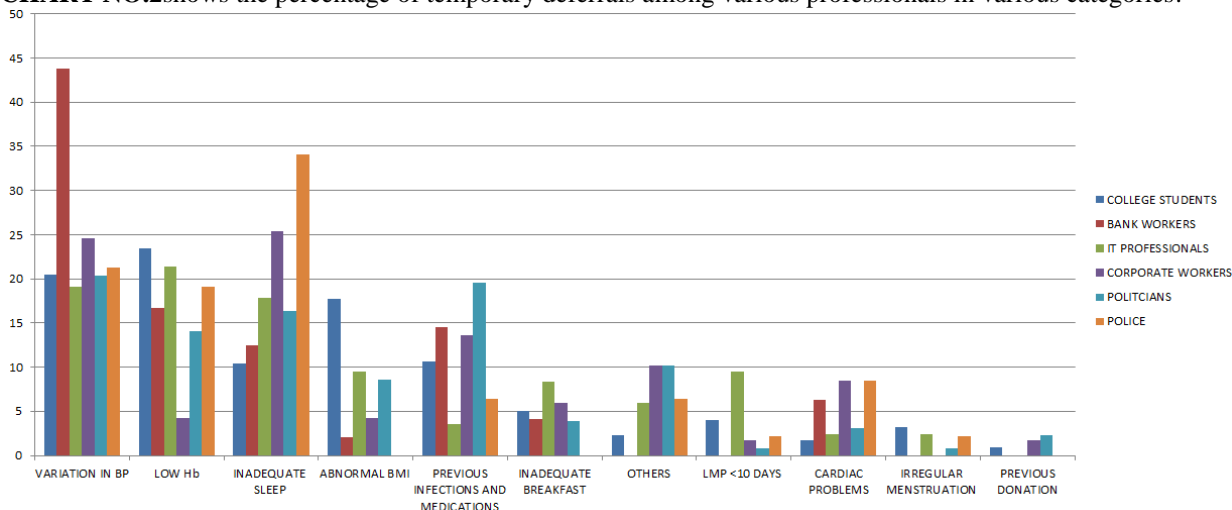


TABLE NO.3 shows the percentage of temporary deferrals among various professionals in various categories.

PROFESSIONS	VARIATION IN BP	LOW Hb	INADEQUATE SLEEP	ABNORMAL BMI	PREVIOUS INFECTIONS AND MEDICATIONS	INADEQUATE BREAKFAST	OTHERS	LMP <10 DAYS	CARDIAC PROBLEMS	IRREGULAR MENSTRUATION	PREVIOUS DONATION
COLLEGE STUDENTS	20.51	23.48	10.39	17.68	10.67	4.99	2.29	4.04	1.76	3.24	0.95
BANK WORKERS	43.75	16.67	12.5	2.08	14.58	4.17	0	0	6.25	0	0
IT PROFESSIONALS	19.05	21.43	17.86	9.52	3.57	8.34	5.95	9.52	2.38	2.38	0
CORPORATE WORKERS	24.57	4.24	25.42	4.24	13.56	5.93	10.17	1.7	8.47	0	1.7
POLITICAL PARTY POLICE	20.31	14.06	16.41	8.59	19.54	3.91	10.15	0.78	3.13	0.78	2.34
POLICE	21.27	19.15	34.04	0	6.38	0	6.38	2.13	8.52	2.13	0

CHART NO.2 shows the percentage of temporary deferrals among various professionals in various categories.



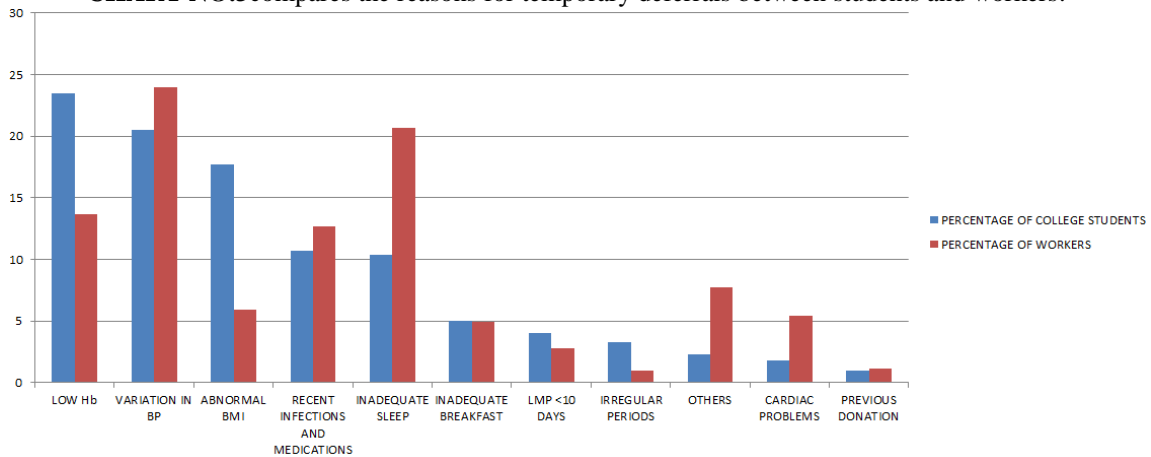
College students showed an increased rate of Low Hemoglobin (23.48%), Variation in blood pressure (20.51%) and abnormal Body Mass Index (17.68%). Bank workers showed a maximum rate of Variation in blood pressure (43.75%) which mainly constitutes Hypertension. IT professionals had Low

Hemoglobin(21.43%),blood pressure disparities(19.05%) and inadequate sleep 17.86%) as top deferral reasons. Corporate workers showed a maximum rejection rate in inadequate sleep (25.42%) and abnormal blood pressure (24.57%). Politicians had various reasons to account for their rejection like Abnormal Blood pressure (20.31%), recent medications (19.54%), low hemoglobin (14.06%) and inadequate sleep (16.41%). Police had problems in inadequate sleep (34.04%),bloodpressure (21.27%)and hemoglobin (19.15%).

TABLE NO.4 compares the reasons for temporary deferrals between students and other professions.

PROFESSIONS	LOW Hb	VARIATION IN BP	ABNORMAL BMI	RECENT INFECTIONS AND MEDICATIONS	INADEQUATE SLEEP	INADEQUATE BREAKFAST	LMP <10 DAYS	IRREGULAR MENSTRUATION	OTHERS	CARDIAC PROBLEMS	PREVIOUS DONATION	TOTAL
COLLEGE STUDENTS	174	152	131	79	77	37	30	24	17	13	7	741
PERCENTAGE OF COLLEGE STUDENTS	23.48	20.51	17.68	10.67	10.39	4.99	4.04	3.24	2.29	1.76	0.95	
WORKERS	58	102	25	54	88	21	12	4	33	23	5	425
PERCENTAGE OF WORKERS	13.65	24	5.89	12.71	20.71	4.94	2.82	0.94	7.76	5.41	1.17	

CHART NO.3 compares the reasons for temporary deferrals between students and workers.

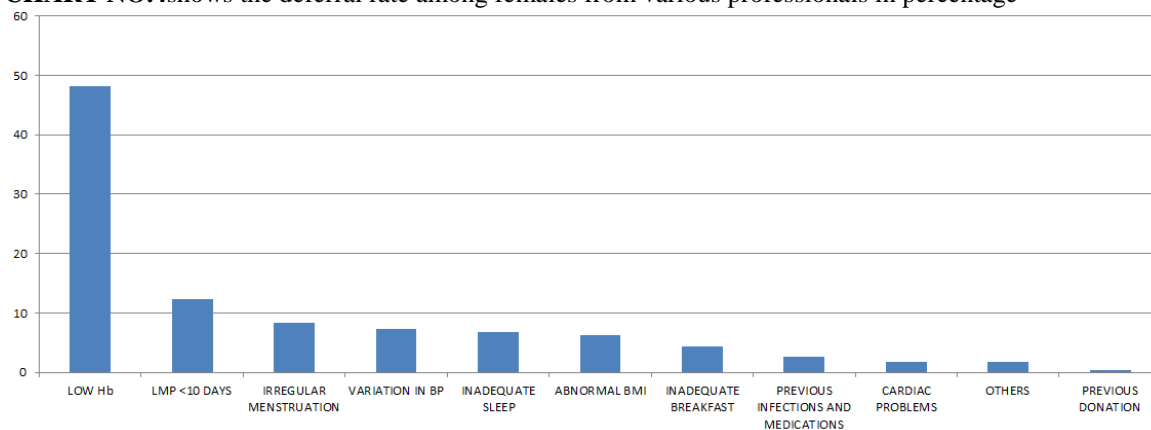


(Here workers include Bank workers, IT professionals, Police, Politicians and Corporate workers) Students showed greater rejection in Blood Hemoglobin level (23.48%) and abnormal BMI (17.68%). Many students were underweight. Some fractions of the students were overweight. Female students constitute a major part in Low blood hemoglobin level. On comparing, the rejection rates of workers in Variation in Blood pressure (24%), Cardiac Problems (5.41%), inadequate sleep (20.71%) were greater than Students.

GENDER	LOW Hb	LMP <10 DAY S	IRREGULAR MENSTRUATION	VARIATION IN BP	INADEQUATE SLEEP	ABNORMAL BMI	INADEQUATE BREAKFAST	PREVIOUS INFECTIONS AND MEDICATIONS	CARDIAC PROBLEMS	OTHERS	PREVIOUS DONATION	TOTAL
FEMALE	163	42	28	25	23	21	15	9	6	6	1	339
FEMALE %	48.1	12.39	8.26	7.37	6.78	6.19	4.42	2.65	1.77	1.77	0.3	

TABLE NO 5 shows the deferral rate among females from various professionals

CHART NO.4 shows the deferral rate among females from various professionals in percentage



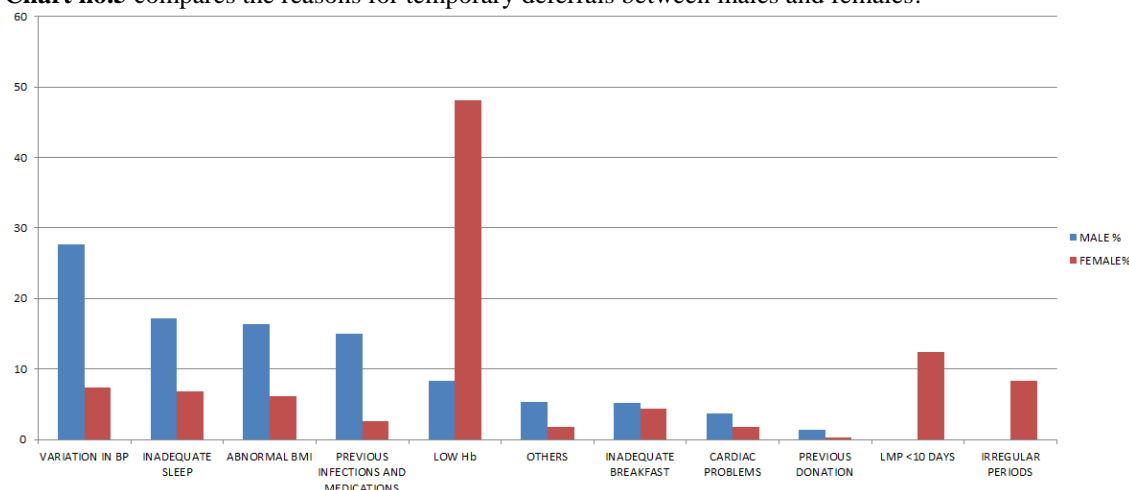
Female subjects showed a very high deferral rate in Low Hemoglobin Level (48.1%). Last Menstrual phase less than 10 days (12.39%) is the next reason and Irregular menstruation (8.26%) follows it

Table no.6 compares the reasons of deferrals between males and females

SEX	VARIATION IN BP	INADEQUATE SLEEP	ABNORMAL BMI	PREVIOUS INFECTIONS AND MEDICATIONS	LOW Hb	OTHERS	INADEQUATE BREAKFAST	CARDIAC PROBLEMS	PREVIOUS DONATION	LMP <10 DAYS	IRREGULAR MENSTRUATION	TOTAL
MALES	229	142	135	124	69	44	43	30	11	N/A	N/A	827
MALE %	27.7	17.17	16.32	14.99	8.34	5.32	5.2	3.63	1.33	N/A	N/A	
FEMALES	25	23	21	9	163	6	15	6	1	42	28	339
FEMALE %	7.37	6.78	6.19	2.65	48.1	1.77	4.42	1.77	0.3	12.39	8.26	

Male subjects showed a higher rate of rejection in Blood pressure problems (27.7%), inadequate sleep (17.17%) and abnormal BMI (16.32%). Female were rejected mostly in Low Hemoglobin levels (48.1%). Low Hemoglobin levels in male subjects are to be noted.

Chart no.5 compares the reasons for temporary deferrals between males and females.



While comparing the causes for temporary deferrals among various professionals, the causes for temporary deferrals can be put in equivalence for the normal population.

Low hemoglobin is the main reason for rejection among students. Variation in blood pressure is the main reason among Bank Workers, IT professionals and Politicians.

Lack of adequate sleep is the major reason of rejection among Police and Corporate Workers.

Variation in blood pressure among males and low hemoglobin in females is the major reason for rejection.

Blood pressure problems in students and overweight in IT professionals are considered as an emerging risk factor in the current society

VI. Discussion

There is an increase in demand for blood and blood components every day. So the conduction of camps among various places is becoming an indispensable one. Unfortunately nearly 40% of the people coming to camps are rejected. So only the remaining 60% people are only accepted as donors. We can increase this percentage of fit donor by creating prior awareness in the Institution in which the camp is going to be held. So we can reduce the rejection rate in Inadequate Sleep (14.16%) and Inadequate Breakfast (4.97%). The Blood Bank in our college, Coimbatore Medical College Hospital, conducted such prior awareness programs and the rejection rate of inadequate sleep and breakfast reduced in such camps. Our Blood Bank is also conducting Anemia Awareness Programs to increase the awareness among public regarding anemia

Variation in Blood pressure tops the reason for temporary deferrals (21.78%). It is higher in workers (24% among various reasons in workers) than in college students (20.51% among various reasons in students) and it is the highest among Bank workers (43.75% among various reasons in bank workers). Students showed an alarming rate of hypertension which is to be noted but some students had hypotension too. This study shows that the risk of hypertension is increasing among college students. This may be due to exam stress, inadequate sleep, improper diet, bad lifestyle and other environmental factors and personal factors like smoking and alcohol. On comparing males and females, males show a higher rate in blood pressure problems (27.7% among various reasons in males) than females (7.37% among various reasons in females). Lifestyle modifications are putting the lives of college students in grave danger. Junk foods and lack of sleep are the aggravating factors for the incidence of hypertension among college students. Healthy lifestyle modifications should be adapted to prevent this progress. Healthy adaptations like eating healthy food and avoiding junk foods, avoiding the usage of mobile phones and other accessories late at night and avoiding working late at night can prevent the occurrence of hypertension. Usually the student age group is the most potential donor age group. We are losing our most potential donors due to unhealthy lifestyle modifications. Prior Awareness programs are conducted among college institutions for healthy lifestyle modifications

Low hemoglobin is the second most common reason for rejection (19.9%). Its incidence is higher among females (48.1% among various reasons in females) than males (8.34% among various reasons in males). This shows that females have poor nutrition and an imbalanced diet. Many studies show that 1 in 2 females are anemic (nearly 50%). The incidence of anemia in developing countries like India is very high (55% among females, 70% among children). Developing countries should start initiatives to reduce the prevalence of anemia by proper nutrition methods. The number of females attending a blood camp is usually lesser than males and they are in high risks for getting eliminated in Hemoglobin test. So the number of healthy female donors is usually lower than healthy male donors. Irregular menstruation seems to be an emerging disorder among females (8.26% among various reasons in females). The number of female donors from a camp should be increased for increasing the donor count. The percentage of male anemic donors is increasing in an alarming rate. The occurrence of anemia in males is usually due to unhealthy food and lifestyle adaptations

Abnormal BMI is the third common reason for rejection (13.38%). Among college students, both underweight and overweight are noted. Students from arts and science colleges showed an increase rate of underweight. Underweight is due to malnutrition, poor economic status and poor feeding habits. Overweight is an emerging factor among all college students. IT professionals showed an increasing risk of overweight. This may be due to lifestyle modifications, late night eating due to job shifts, lack of physical exercise and poor feeding habits.

People who are overweight have high risks for diabetes mellitus, hypertension, dyslipidemia, cardiac problems, and liver problems. So overweight is the main reason for occurrence of metabolic disorders at an early age.

Police, Corporate workers and IT professionals showed an increase rate of rejection due to inadequate sleep. This is due to night shifts and job stress. Prior awareness can reduce this rate. Lack of adequate sleep is a risk factor for mental problems, blood pressure problems, cardiac problems, accidents and reduced efficiency in work.

Blood pressure problems and overweight at an early age are the emerging problems in the modern society. Low hemoglobin in females is a prevailing problem in India. Irregular menstruation also seems to be a common problem among females.

Everyone can be a healthy donor by keeping themselves fit. Blood transfusion must be done in cases of severe hemorrhage, accidents, and surgeries and there will be increased demands for blood in case of dengue outbreak. So if we reduce this rejection pattern among the various professions, the demands for blood transfusion can be met in day-to-day life.

VII. Conclusion

Healthylifestyle modifications is a must need for the current generation. From this study we can conclude that proper healthy adaptations can increase the percentage of healthy donors so that the demand for blood supply can be met accordingly. Prior awareness is an absolute necessary to reduce the rejection rate due to inadequate sleep and breakfast. Blood pressure variations and abnormal Body Mass Index (BMI) is emerging risk factors among college students and IT professionals. The number of females attending a blood camp is usually low. Low hemoglobin levels prevails as the top deferral reason among females. Blood pressure variations is the main deferral cause for Politicians, Bank workers and IT professionals. Inadequate sleep is the main factor for rejection among Police and Corporate workers. Healthy adaptations and prior awareness programs are the ways to reduce the rejection pattern among blood donors

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