FACTORS THAT ARE AFFECTING DEFERRAL VOLENTEREE BLOOD DONARS AS IN THE CASE ETHIOPIA IN PARTICULAR CITY

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Abstract: *This study was conducted in Nekemte, located 328 k.m. distances from Addis Ababa capital of Ethiopia. Nekemte is the current capital East Wollege zone which is in western part of the Ethiopia in Oromia regional state. This case study focuses on factors that affected referral in case Nekemte voluntary blood donation population. The main objective of this study was to assess the major factors that contribute deferral for voluntary blood donation in the study area. We use sample of 105 respondents, selected from the Nekemte town Blood Donor's Data which gathered in time of interval. The secondary data was obtained from the sample of 105 who were selected using simple random sampling from deferred population 15 are male participators with valid of 44% and 19 female participators with 66%. Finally, we recommended that both government and non – government organization should work hard to reduce factors that affect deferral of voluntary blood donation by providing awareness for all population through health care center and health professionals. We used analyzing the data, and use SPSS version 20.0, the descriptive statistical tools, Chi – square test of independency, Binary logistic regression analysis carried out.*

Keywords: *Antilogous blood donation, Anemia, Deferral, Hematocrit, Cryoprecipitate*

1. BACKGROUND OF THE STUDY

Blood cannot be manufactured; it can only come from generous donors. Blood can save million of human life. Blood donation refers to the process of collecting, testing, preparing, and storing blood and blood components. Donors are most commonly unpaid volunteers, but they may also be paid by commercial enterprises. Blood registry refers to the collection and sharing of data about donated blood and ineligible donors. [18]

The purpose of the blood collection and distribution system is to help ensure an adequate supply of blood for accident victims, people needing surgery, and they suffering from certain diseases, as well as for medical research [17, 18]. To give importance of these Blood donor's

worldwide June 14 (mention year) was chosen as World Blood Donor Day as it was the birthday of Karl Landsteiner who first found blood groups in 1900 [4]. Sometimes, donors give blood specifically to benefit a particular person. People preparing for elective surgery may donate their own blood to be held and then returned to them during surgery. This is known as antilogous blood donation. Directed donor blood has been donated by someone known to the independent recipient, such as a family members or friend [1].

Whole blood and the various blood components have many uses. Red blood cells, which carry oxygen are used to treat anemia, Platelets, which play a role in controlling bleeding, are commonly used in the treatment of leukemia and other cancers [5]. Fresh frozen plasma is also used to control bleeding in people deficient in certain clotting factors. Cryoprecipitate AHF, made from fresh frozen plasma, contains a few specific clotting factors [6].

1.1. Statement of Problems

Most of the persons have different problems of donating blood and they have different effects of the problem also the researcher is to attain the instructive goal, one be supposed to have to take account and settle the problems that restrict population to donate the blood [2]. These factors can be known and get solutions through condition of educational research. However, some persons have voluntary to donate blood, they are restricted/deferred/by different factors [3]. Thus, this study will conduct to answer the following research questions.

- What are factors that significantly restrict the population to donate blood?
- What are impacts of factors on affect blood donors in Nekemte town in Ethiopia?

1.2. Objective of the Study

1.2.1. General Objective

To find the factors which are affecting restriction/deferral/the blood donors study area in Nekemte town population

1.2.2. Specific Objectives

- To identify the factors which are significantly affect restriction the population towards blood donation
- To find the association between demographic variables against factors affecting deferral population towards donation

1.3. Hypothesis of the Study

General Hypothesis

H_0 : There is no association between factors (explanatory variables) and Blood donation status.

H_1 : There is association between factors (explanatory variables) and Blood donation status.

Specific Hypothesis

H_{01} : There is no association between age of the respondents and sex of the respondents.

H_{02} : There is no association between age and Hematocrit of respondents.

H_{03} : There is no association between age and Blood pressure status of the respondents.

1.4. Significance of the Study

This study helps to identify the major factors that affect restriction the population toward blood donation, so that it enables the concerned body.

1.5. Scope of the Study

This study focused on the descriptive and explanatory analysis of the factors that affects restriction the population towards blood donation in Nekemte town.

1.6. Research Design and Methodology

1.6.1. Research Design

The study was a cross sectional analysis of secondary data obtained from Nekemte Blood Bank provinces in 1st July 2011 to 30th March 2012

1.6.2 Sampling and Sampling Technique

Simple random sampling (SRS) technique is adopted for population that has the same chance (Homogeneity) for selection. For this study also SRS would be used to select the representatives from the data's of target population registered in Nekemte Blood Bank.

1.6.3. Sample Size Determination

Determining sample size is the key step in all research methods. An appropriate sample size is means of gaining high precession, accuracy and confidence with low cost. Even though it is known that more reliable information is obtained from large sample size and accurate and successful results of the finding, considered availability of budget, time and data collections, sample size was determined from the total number of population $N = 1809$. Sample size determination formula depends on the sampling technique adopted to study the largest population. In the study, SRS technique is used accordingly, the sample size formulas used is given by

$n = \frac{n_0}{1+(n_0/N)} = 105, where\ n_0 = \frac{Z_{(\alpha/2)pq}}{d^2} = 111$, for

$p \longrightarrow$ Proportional of the responds who donate blood (succeeded) $= 0.85$

$q \longrightarrow$ Proportional of the responds those were restricted to donate blood (not succeeded) $=$ 0.15

$d \longrightarrow$ Marginal error and

$Z = 1.96$ Two sided

Therefore the sample size is 105 for this study

1.7. Study Variables

1.7.1. Dependent Variables

Blood Donation Status (Code: donate $= 1$, and deferred $= 0$)

1.7.2. Independent Variables

Age, Sex, Marital status

1.7.3. Coding for the Variable: (For SPSS 20)

Table – 1.1(a)

Age	$15-19$	$20-24$	$25-29$	$30-34$	$35-39$	$40-44$	$45-49$	≥ 50
Code	1	2	3	4	5	6	7	8

Table – 1.1(b)

Sex	Code	Marital Status	Code
Male	0	Single	0
Female	1	Married	1

Table – 1.1(c)

Variables	Code
Pregnant Status – Lactation Status – Hematocrit Status – Blood Pressure Status Under Weight Status – History of Disease – History of Infection Disease – History of infection Disease – Blood Donation	$0 = No$ $1 = Yes$

The data's of sample population which would be obtained from OROMIA HEALTH BREAU MEKEMET BLOOD BANK would be analyzed by using descriptive and inferential statistics. After data is obtained, each variable was checked for completeness edited, cleaned missed values and missed variables and data were analyzed by using SPSS software version 20 to provide frequencies and percentages for categorical variables and means and standard deviations for numerical variables.

2. ANALYSIS OF DATA AND DISCUSSION

2.1. Descriptive Statistics

In this study the sample size has taken as 105 respondents. Here the discussion made on their demographic variables of the respondents.

Table – 2.1: Frequency of Age of the Respondents

Age	$15-19$	$20-24$	$25-29$	$30-34$	$35-39$	$40-44$	$45-49$	≥ 50	Total
Number of Respondents	27	30	21	10	8	5	2	2	105
%	25.7	28.6	20.0	9.5	7.6	4.8	1.9	1.9	100

From Table – 2.1, the demographic variable ages were discussed. Age ranges from 15 – 50, and above, it is observed that the age group 20 – 24 have maximum respondent of 30 respondents it implies that out of 105 respondents it has around 29% were belongs to this age group and in the case of age groups 45 – 49, and above 50 has minimum respondent out of 105 it has totally 4%. The rest of the ages are have the in between values. The diagram – 1, below shows the distribution of age with respect to the age and number of respondents:

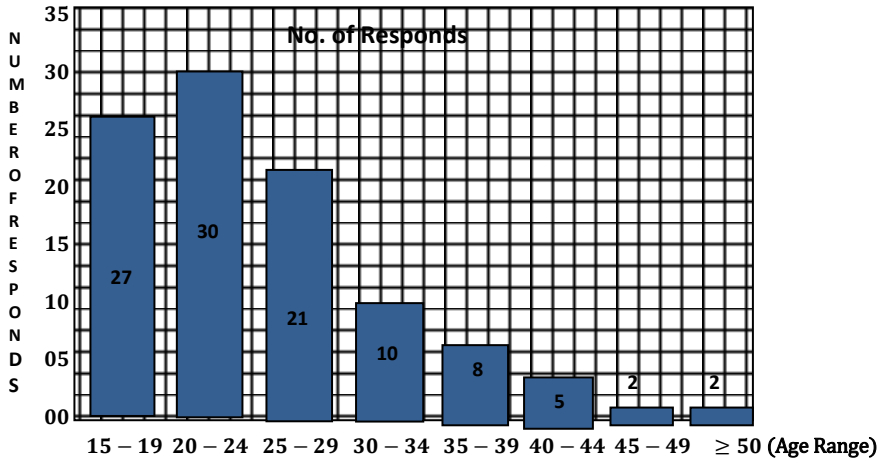


Table – 2.2: Frequency of Sex of the Respondents

Sex	*Male*	*Female*	*Total*
Number of Respondents	61	44	105
%	58.1	41.9	100

In Table – 2.2, it was presented about the gender classification of respondent involved in this study. That is out of 105 respondents 61 were male that is more than 50% were male and female respondents under out study was 44 is round of 42%. Further it was observed that out of 105 respondents male has maximum involved compare to female. Below diagram – 2 shows the gender involved in this study.

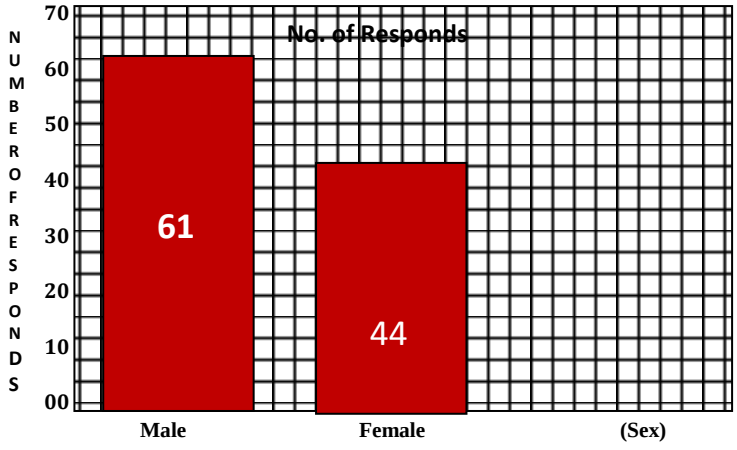
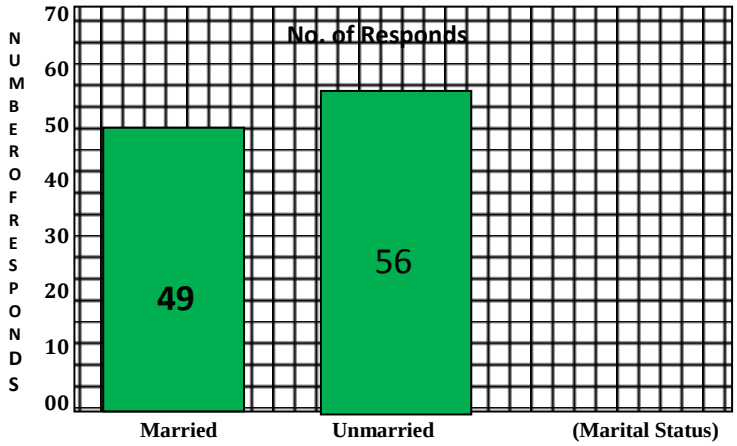


Table – 2.3: Frequency of Martial Status of the Respondents

Marital Status	*Married*	*Unmarried*	*Total*
Number of Respondents	49	56	105
%	46.7	53.3	100

In Table – 2.3, it shows that it was involved with the respondents with respect to their marital status. There were two classification made as "Married and Unmarried". It shows that out 105 respondents nearly 47% were classified as unmarried, as married 53% were marital status of respondents. Further by observation it was evident that the respondents were involved more comparatively with unmarried in donating blood. The diagram – 3 shows the marital status of respondents involved in blood donation.



Note that, in the following tables diagrams are same as before that is why not necessary to draw them again.

Table – 2.4: Frequency of Distribution of Pregnancy Status of the Respondents

Pregnancy Status	*Pregnant*	*Non Pregnant*	*Total*
Number of Respondents	2	42	44
%	4.6	53.3	100

In Table – 2.4, it was observed that the female respondents with the status of pregnant women involved in deferred blood donation study, out of 44 women nearly 5% of them pregnant and remaining as non – pregnant. It shows that even pregnant women were showing their interest in blood donation [7]. Out of 40% of female involved the status of not pregnant have maximum in number of respondents involved in this study.

Table – 2.5: Frequency of Distribution of Lactation status of the Respondents

Lactation Status	*No Lactation*	*Lactation*	*Total*
Number of Respondents	1	43	44
%	2.3	97.7	100

In Table – 2.5, it was observed that variable involved with female with respect their Lactation status, out of 44 women respondents 43 were not involved with lactation activity that is

nearly 98% female were free from lactation and the rest nearly 2% were involved in lactation or feeding status. Further out of 41% (nearly) involved the statuses of no Lactation status have maximum number of respondents involved in this study.

Table – 2.6: Frequency of Distribution of Hematocrit status of the Respondents

Lactation Status	*Non Hermatocrit*	*Hermatocrit*	*Total*
Number of Respondents	8	97	105
%	7.6	92.4	100

In Table – 2.6, it was observed that the respondents with Hematocrit status, out of 105 the normal respondents (Non – Hematocrit) depict as nearly 92% and the status of Hematocrit respondents nearly 8% and also most of them were normal persons with respect to presence of Hematocrit compliant.

Table – 2.7: Frequency of Distribution of Weight status of the Respondents

Weight Status	*Under* 50 *Kg*	*Above* 50 *kg*	*Total*
Number of Respondents	1	104	105
%	1.0	99.0	100

In Table – 2.7, the discussion regarding with respect to weight of the respondents. According to the blood donors, criteria weight is considered as one of the factors involved, it has two categories the weight 50 kg and above have maximum respondents with 99% and under 50 kg has minimum respondents with 1% only.

Table – 2.8: Frequency of Blood pressure (BP) status of the Respondents

BP Status	*With BP*	*Normal BP*	*Total*
Number of Respondents	11	94	105
%	10.48	89.52	100

A mini – physical checking is given for every blood donors like as the donor's temperature, BP, pulse and hemoglobin to ensure it is safe for the donor before giving blood. Hence it is necessary to involve BP status in this study [1]. Thus to find out the respondents those who were involved in this study with BP or not as shown in Table – 2.8, and observe that around 10% (nearly) were having BP and 90 (nearly) were having normal BP that is in this study maximum number of respondents were free from BP and less people were with BP.

Table – 2.9: Frequency of Distribution of History of Disease of the Respondents

Weight Status	*Disease*	*Normal*	*Total*
Number of Respondents	9	96	105
%	8.57	91.43	100

All donated blood must be tested for HIV, Hepatitis B and C, Syphilis and other infectious diseases before it can be released from hospital [16]. For this purpose it is necessary to show interest on the History of disease as shown in Table – 2.9, it depict nearly 91% of respondents in normal condition were free from disease and 9% have diseases.

Table – 2.10: Frequency of Distribution of History of Infection Diseases of the Respondents

Weight Status	$Under\ 50\ Kg$	$Above\ 50\ kg$	$Total$
Number of Respondents	2	102	105
%	1.9	98.1	100

As we mention above, we shown our interest among the observed respondents those who have infectious disease or not. From Table – 2.10 conclude that in Blood donation register in Nekemte Blood Bank only 2% (nearly were found by infection disease and the respondents that is nearly 98% of them were registered as normal donors.

Table – 2.11: Frequency of Distribution of Blood Donation Status

Weight Status	$Deferred$	$donors$	$Total$
Number of Respondents	34	71	105
%	32.38	67.62	100

Table – 2.11, it is very important of this study, the variable status of blood donation is dependent variable with all other variables involved as independent [8]. Out of 105 respondents, observe that 71 respondents who have blood (succeeded to donate blood). That is according to the register in Nekemte Blood Bank, nearly 68% of them were found eligible to give blood and these respondents they don't have any lack of criteria by the blood donor's regulation. Further nearly 32% of respondents in our study had some deferred in blood donation have some absence in their Health Status.

3. CROSS TABULATION [10, 14]

Cross tabulation analysis were used to study more than one variable involvement it has two or multidimensional view. Hence for a detailed analysis we present cross tabulation in this study.

Table – 3.1: Cross Tabulation for Pregnant Status of Respondents with respect to Age and Marital Status with reference to female classification

Variables	Pregnant Status of Response		Total	Correlation	Chi - square	P - value	Inference – e
Age	Yes	No					
$15-19$	14	0	14				
$20-24$	12	2	14				
$25-29$	8	0	8				
$30-34$	3	0	3				
$35-39$	2	0	2				
$40-44$	2	0	2				
$45-49$	0	0	0				
≥ 50	1	0	1				
Marital Status				**0.209**	**4.49 with 6 df**	**0.611**	**Accept H_0 at 5%**
Married	21	2	23				
Single	21	0	21				

From the Table 3.1 the respondent's pregnant status [9] associated with the demographic variables such as Age and Marital status with respect to female respondents. As we observe age with pregnant status, there was a low positive correlation existed, regarding chi – square test, it is evident that to accept the Null hypothesis, it means that there was no association between age and the status of pregnancy. Again an analysis performed with the variable marital status associated with pregnant status shows a low positive correlation with coefficient of 0.209. Test base on chi – square with a Null hypothesis of there is no association between marital status and pregnant status at 5% level and it gives a critical value at 1.913 with 1 df, P −value 1.167. Hence it is evident to accept the null hypothesis.

Table – 3.2: Cross Tabulation for Lactation Status of Respondents with respect to Age and Marital Status as female involved

Variables	Pregnant Status of Response		Total	Correlation	Chi – square	P - value	Inference – e
Age	Yes	No					
15 – 19	14	0	14	**0.052**	**4.605 with 6 df**	**0.595**	**Accept H_0 at 5%**
20 – 24	14	0	14				
25 – 29	7	1	8				
30 – 34	3	0	3				
Marital Status							
Married	1	21	23	**0.146**	**0.934 with 1 df**	**0.334**	**Accept H_0 at 5%**
Single	0	0	0				

From the Table – 3.2, the respondent's lactation status associated with the demographic variables such as Age and Marital status with respect to female respondents, observe age with lactation status, there was a low Positive correlation existed, regarding chi – square test it is evident that to accept the Null hypothesis, means that there was no association between age and the female with lactation. Further an analysis performed with the variable marital status associated with lactation status shows a low positive correlation with coefficient of 0.146 Test base on chi – square with a Null hypothesis of there is no association between marital status and pregnant status at 5% level and it gives a critical value at 0.934 with 1 df, P −value 0.334. Hence it is evident to accept the null hypothesis.

Table – 3.3: Cross Tabulation for Hematocrit Status of Respondents with respect to Age, Gender and Marital Status

Variables	Hematocrit Status of Response		Total	Correlation	Chi - square	P – value	Inference – e
Age	Yes	No					
$15-19$	4	23	27				
$20-24$	1	29	30				
$25-29$	2	19	21				
$30-34$	0	10	10				
$35-39$	0	8	8				
$40-44$	0	5	5				
$45-49$	0	2	2				
≥ 50	1	1	2	**0.209**	**10.043 with 7 df**	**0.186**	**Accept H_0 at 5%**
Gender							
Male	2	59	61	**-0.193**	**3.896 with 1 df**	**0.048**	**Reject H_0 at 5%**
Female	6	38	44				
Marital Status							
Married	4	45	49	**0.019**	**0.0394 with 1 df**	**0.844**	**Accept H_0 at 5%**
Single	4	52	56				

In Table – 3.3, the cross tabulation made for different demographic variables with their Hematocrit status of the respondents. In general 7.62% not having presence of Hemistich status out of 105 respondents, further it has been observed in the age group $(15-19)$ have 14.8% affected, and in the age group $(20-24)$ it depict 3.33% and 10.52% have affected, in the age group $(25-29)$ have affected, in the age group $above$ 50 have affected 50%. In performing the testing of hypothesis with a chi – square test for association at 5% level the result has supporting to the Null hypothesis that there is no association between age and Hemistich status with critical value of 10.043 with 7 df. Again to check the relation with direction using correlation coefficient it gave a value of 0.209. It implies that there is a low positive correlation between these variables. the analysis with Gender it is observed totally 8 respondents with hemistich presence, Out of 61 of male around 4.88% of them were presence of hemistich status and out 44 female responds 3.52% were involved with hemistich status. The correlation shows a low negative relation between these variables. Regarding with chi – square for association of attributes, the critical value is 3.896 with 1 df at 5%, the result is evident not to accept the Null hypothesis. Regarding the Marital status out of 49 married status 3.92% were with presence of hemistich status and in the category of married status out of 56 respondents 4.48% were with presence of hemistich status. The analysis were made with correlation as 0.019, that means there variables have low positive association and

further from chi – square test the critical value 0.0394 $1\,df$ at 5%, with P −value of 0.844, from this it is possible to made a conclusion that we accept our null hypothesis.

Table – 3.4: Cross Tabulation for Weight Status of Respondents with respect to Age, Gender and Marital Status

Variables	Weight Status of Response		Total	Correlation	Chi – square	P – value	Inference – e
Age	Yes	No					
$15-19$	1	26	27				
$20-24$	0	30	30				
$25-29$	0	21	21				
$30-34$	0	10	10	**0.102**	**2.927 with 7 df**	**0.893**	**Accept H_0 at 5%**
$35-39$	0	8	8				
$40-44$	0	5	5				
$45-49$	0	2	2				
≥ 50	0	2	2				
Gender							
Male	1	60	61	**0.083**	**0.728 with 1 df**	**0.393**	**Accept H_0 at 5%**
Female	0	44	44				
Marital Status							
Married	0	56	56	**0.105**	**1.154 with 1 df**	**0.283**	**Accept H_0 at 5%**
Single	1	48	49				

In Table – 3.4, the cross tabulation made for different demographic variables with their Weight status of the respondents. Regarding weight there were two classifications made one is underweight and the other is overweight. In general out of 105 respondents 1 respondent identified as a underweight and that respondent belongs to male and with the age group of $(15-19)$.In performing the testing of hypothesis with a chi – square test for association at 5% level the result has supporting to accept the Null hypothesis that there is no association between age and weight status with a critical value of 2.927 with $7\,df$. Again to check the relation with direction using correlation coefficient of 0.102: It implies that there is a low positive correction between these variables. The analysis with Gender observed totally 1 respondent has with low weight. The correlation shows a low positive relation between these variables. Regarding with Chi – square test for association of attributes, the critical value is 0.728 with $1\,df$ at 5%, the result is evident that accept the Null hypothesis. Regarding the Marital status out of 49 single statuses respondent 1 person have under weight and the respondent belongs to unmarried or single group of their married status. The analysis were made association and further Chi – square test the critical value is 1.154 with $1\,df$ at 5%, with a P −value of 0.283, from this it is possible to made a conclusion that we accept our null hypothesis.

Table – 3.5: Cross Tabulation for Blood Pressure Status of Respondents with respect to Age, Gender and Marital Status

Variables	Blood Pressure Status of Response		Total	Correlation	Chi – square	P – value	Inference – e
Age	Yes	No					
15 – 19	7	20	27				
20 – 24	2	28	30				
25 – 29	0	21	21				
30 – 34	1	9	10	-0.191	10.884 with 7 df	0.144	Accept H_0 at 5%
35 – 39	1	7	8				
40 – 44	0	5	5				
45 – 49	0	2	2				
≥ 50	0	2	2				
Gender							
Male	5	56	61	0.080	0.806 with 1 df	0.280	Accept H_0 at 5%
Female	6	38	44				
Marital Status							
Married	3	53	56	-0.180	3.352 with 1 df	0.067	Accept H_0 at 5%
Single	8	41	49				

In Table – 3.5, the cross tabulation made for different demographic variables with their Blood Donation status of the respondents. Regarding Blood donation there were two classifications made one having and other group is not having. In general out of 105 respondents 11 respondents identified as a BP status. In performing the testing of hypothesis with a Chi – square test for association at 5% level the result has supporting to accept the null hypothesis that there is no association between age and BP status with a critical value of 10.884 with 7 df. the analysis with Gender it is observed totally 8 respondents with hemistich presence, Out of 61 of male around 6.1% of them were presence of hemistich status and out 44 female responds 4.4% were involved with hemistich status. The correlation shows a low negative relation between these variables is -0.191. Regarding with chi – square for association of attributes, the critical value is with 0.806, 1 df at 5%. The result is evident to accept the Null hypothesis at 5%. Regarding the marital status out of 56 respondents 3 of them have BP presence and in single status respondents out of 49 respondents 8 of them have BP. The analysis were made with correlation coefficient of -0.18, that means there variables have low negative association and further from Chi – square test the critical value is 3.352 1 df with P $-$value of 0.067, from this result is evident to accept the Null hypothesis at 5%.

Table – 3.6: Cross Tabulation for Blood Donation Status of Respondents with respect to Age, Gender and Marital Status

Variables	Blood Donation Status of Response		Total	Correlation	Chi – square	P – value	Inference – e
Age	Yes	No					
$15-19$	15	12	27	**0.227**	**9.727 with 7 df**	**0.205**	**Accept H_0 at 5%**
$20-24$	19	11	30				
$25-29$	13	8	21				
$30-34$	9	1	10				
$35-39$	7	1	8				
$40-44$	5	0	5				
$45-49$	2	0	2				
≥ 50	1	1	2				
Gender							
Male	46	15	61	**-0.179**	**4.035 with 1 df**	**0.045**	**Reject H_0 at 5%**
Female	25	19	44				
Marital Status							
Married	41	15	56	**0.128**	**1.716 with 1 df**	**0.190**	**Accept H_0 at 5%**
Single	30	19	49				

In Table – 3.6, the cross tabulation made for different demographic variables with their Blood Pressure status of the respondents. Regarding Blood donation status were two classifications made one having and other group is not having. In general out of 105 respondents 71 respondents identified as a Blood donation status. In performing the testing of hypothesis with a Chi – square test for association at 5% level the result has supporting to accept the null hypothesis that there is no association between age and Blood donation status with a critical value of 9.727 with 7 df. The analysis with Gender it is observed with Blood donation, out of 61 of male around 39.27% of them were presence of hemistich status and out 44 female responds 28.33% were involved with Blood donation status. The correlation shows a low positive relation between these variables is -0.179. Regarding with chi – square for association of attributes, the critical value is 4.035 with 1 df at 5%, the result is evident not to accept the Null hypothesis at 5%. Regarding the marital status out of 56 respondents 3o of them have Blood donation presence and in single status respondents out of 49 respondents 41 of them have Blood donation. The analysis were made with correlation and it gives a correlation coefficient of 0.128, that means there variables have low positive association and further from Chi – square test the critical value is 1.716, 1 df with $P-$value of 0.190, from this result is evident to accept the Null hypothesis at 5%.

Table – 3.7: Cross Tabulation for Blood Donation Status and History of Diseases of the Respondents

Variables status of Diseases ↓	Blood Donation Status of Response		Total	Correlation	Chi – square	P – value	Inference – e
	Deferred	Donate					
Present	11	0	11	-0.494	25.659 with $1d$	0.00	Reject H_0
Absent	23	71	94				

From Table – 3.7, the bi – variate associations were made and the analysis says that out of 105 respondents 34 were deferred respondents and among them 11 respondents were affected with some diseases they were not able to give blood. Further again 34 deferred 23 respondents were absent of diseases and not able to give blood, comparatively with normal people the affected were less in numbers. In correlation analysis it gives a low negative coefficient it means that the variable of status of diseases and obtaining blood were negative in direction. This means the affected people may have less chance to donated blood. In testing of hypothesis by using Chi – square we have reject the hull hypothesis as a conclusion of these is a significant difference between the diseases status and Blood donors.

4. LOGISTIC REGRESSION

Logistic regression is used to predict a categorical (usually dichotomous) variable from asset of predictor variables. With a categorical dependent variable, discriminate function analysis is usually employ edit fall of the predictors are continuous and nicely distributed; logistic analysis is usually employed if all of the predictors are categorical; and logistic regression is often chosen if the predictor variables are a mix of continuous and categorical variables and/or if they are not nicely distributed (logistic regression makes no assumptions about the distributions of the predictor variables). Logistic regression has been especially popular with medical research in which the dependent variables whether or not a patient has a disease. In our study we consider 105 respondents; we performed logistic regression has been especially popular with medical research in which dependent variable as it is a dichotomous variable and their Gender as a dichotomous predictor variable. The coded information presented below table.

Table – 4.1: Dependent Variable Encoding

Original	Internal
Deferred	0
Donate	1

Table – 4.2: Categorical Variable Coding

Gender	Frequency	Parameter Coding
Male	61	1.00
Female	44	0.00

This analysis is performed in an Iterative Method. In BLOCK O output for this model, that includes only the intercept. For the two status options $(34/105 = 0.323)32\%$, decided to deferred in blood donors and 68% decided to donate and no other information. As the best option is to predict for every case, that the respondent will decide to deferrer: We can say 68% respondents were in correct decisions

Table – 4.3: Variation in the Equation

	B	SE	$Wald$	df	$Sig.$	$Exp(B)$
Step O constant	0.736	0.209	12.465	1	0.00	2.088

The next iteration involves with Block 1 output Block 1 shows the results after the addition of the explanatory variables selected. In Omnibus Test of model of coefficient gives us Chi – square of 4.012 on $1df$, significant beyond 0.045: This test with the null hypothesis of that adding the Gender variable to the model has not significant increased our ability to predict the decisions made by our respondents. In the Omnibus Tests of model coefficients table give the result of the likelihood ratio (LR) $-$Test which indicated whether the inclusion of this Block of variables contributes significantly to model fit. A $P-$value of less than 0.05 for Block means that the block 1 model is a significant improvement to the Block O model.

Table – 4.4: Block – 1 Method: Enter (Omnibus Test of Model Coefficients)

Step - 1	χ^2	df	$Sig.$
Step	4.012	1	0.045
Block	4.012	1	0.045
Model	4.012	1	0.045

Under model summary we see that the $-2\log.$ Likelihood statistic 128.226. This statistic gives as the best model. Adding the Gender value reduced the $-2\log.$ Likelihood statistic by 132.238 and 128.226$=$ 4.012

In the χ^2 statistic in Omnibus Tests of model: Regarding R square we have $2R^2$ Cox and Snell and Nagellerke values are presented to estimate the fit of the model to the data both are transformation so fit the $-2\log.$ likelihood values. It gives the same R square in a multiple regression. In Cox and Snell R square it cannot reach s maximum value of 1 and the Nagellerke R square can reach a maximum of 1. In standard regression, the coefficient of determination is R square values gives as an indication of how much variation in predicted variable is explained by the model. This cannot be calculated for logistic regression, the

above R square try to measure something similar. From the above, we can conclude that between 3.7% and 5.2% of the variation in decisions can be explained by the model in Block 1.

Table – 4.5: Model Summary

Step	-2 log. likelihood	Cox and Snell R square	Nagellerke R square
1	128.226^a	0.037	0.052

Note: a Estimation terminated at iteration number 4 because parameter estimates changed by less than 0.001

Table – 4.6: Classification $Table^a$

	Predicted Status of Blood Donation		Percentage correct
Observed	Deferred	Donate	0.037
Deferred	0	34	0.00
Donate	0	71	100
Over all	0	100	100

Note that the cut value is 0.500

Table – 4.7: Variables in the Equation

Step – 1	B	SE	$Wald$	df	$Sig.$	$Exp(B)$
Step O constant	0.846	0.425	3.955	1	0.047	2.331
Constant	0.274	0.304	0.813	1	0.367	1.316

The variables in Equation Table – 4.7, it summaries the importance of the explanatory variable individually with controlling for the other explanatory variables: The variable in equation is the regression equation for this study and the equation is given as

$\ln(odds) = 0.274 + 0.846(sex)$

By using this model, now we can use this $odds$ as predicted that a subject of a given sex will decide to donate blood. The $odds$ prediction equation is $odds = e^{a+bx}$

In our model $odds$, it is $e^{0.274+0.846x} = 3.06$. This implies that a man is 3.06more likely to donate blood as he is in deferred status.

Now converting $odds$ to probability by using $y = odds/(1 + odds)$, in case of women the $odds$ as probability is $y = 1.31/(1 + 1.31) = 0.567$ i.e. 75% of men will decide to donate blood.

As the discussion $exp(B)$, it is the better as the $odds$ ration predicted by the model. This $odds$ ratio can be computed by raising the base of the natural logarithm of the b^{th} power, where b , it is the slope from tout logistic regression equation. For out model $e^{0.846} = 2.33$ times higher for man than they are for women, for men the $odds$, they are 3.06 and for women is 1.31, the $odds$ ratio or it is $3.06/1.31 = 2.33$.

RESULTS

In this study by using binary logistic regression we analysis for two variables with sex, and Blood donation status. In this we reached an equation as $\ln(odds) = 0.274 + 0.846(sex)$ By using R square analysis it was observed that it will lie between, 3.7% to 5.2% of the variation in decisions can be explained by the model Block – 1

For our model $odds = e^{0.274+0.846x}$, if our subject or respondents being female $(sex = 0)$, and then the

$odds = e^{0.274+0.846\times0} = e^{0.271} = 1.31 \Longrightarrow$A woman is only 1.31 as likely to donate blood as she is in deferred status. If out subject being a male $(sex = 0)$, and then $odds = e^{0.274+0.846\times1} = e^{1.12} = 3.06$

$\Longrightarrow$A man is 3.06 times more likely to donate blood as it is in deferred status [16].

CONCLUSION AND RECOMMENDATION:

This analysis of study was based on the data of 105 of samples obtained from Nekemte blood bank. It is a secondary data were collected from the records available in the Blood Bank. This study is assist in generating hypothesis for research on the possible causes of deferred among various defined groups of potential donors. In this we evaluated the following points [12, 15 & 16]

- Blood donation is completely not differing by sex, age, and marital status.
- Donating blood is not associated with their status of lactation or pregnancy
- Participants had a positive feeling towards blood donation
- A set of reliability and validation rules were applied
- Finally it is more important that the awareness between the respondents were good and they have positive attitude in blood donation.

The study has shown high prevalence of donor deferral due to BP. Deferred potential blood donors might never return to attempt to donate blood due to low morale. The identified correlates could be used when deciding which potential donors to consider for a blood donation after each inter – donation interval has elapsed. For population deferred by BP we recommend that all people should encourage them by idea and support them by everything that need for them to keep their moral. In other study history of disease and history infection disease deferred donors also interest in blood donation [11]. By considering history of disease and infectious disease we recommend that every individual person, government body and non – government or organization should support them by money to cure them from their disease.

The other factor that most deferred is Hematocrit status (low hemoglobin) is also considered. It was found 8 were caused by this low hemoglobin. We suggest that respondents also have to be support by government and other NGO's [13]. Give the high prevalence of low hemoglobin deferral, we recommended that all blood donors be given iron supplements to help with hemoglobin replenishing that would have been removed from the body after each donation. This could reduce incidence of iron deficiency anemia among donors and increase successful donations. Potential donors should also be made aware of the need for iron and float rich diets to avoid developing anemia and thus deferral from donating blood. It should be the man date of blood services to educate these potential donors on foods rich in these essential nutrients.

In this study of 105 sample size it is observed that 44 females were participated, it is nearly 58%. From those 19 participators were deferred. From deferred females 2 are deferred for pregnant and 1 was for lactation. These two variables are separately affects only females participator. Therefore affirmative action is needed for female donor to encourage them. Generally blood is an important component of every country's health delivery system. Blood is used in all clinical disciplines and has been known to save lives. There for every normal population should donate blood to save lives.

Finally we also recommended the following points to be considered

- Maintaining an adequate and safe blood supply is an issue of concern to health planners [17, 18].
- In general, people's intention to donate blood is low. The blood collectors should do periodic community sensitization to upgrade knowledge and create a positive attitude towards voluntary blood donation.
- It is important that the regional Red Cross should use school mini media, Radio, TV program to create awareness among universities students and the next generation of Ethiopia.
- There should be a workshop on Hygienic and sanitary practices because good and healthy people will give blood to this society.

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