



## Comparative study of Voluntary and Replacement blood donors from Blood Bank, Chamba (H.P)

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### Abstract

**Introduction:** Voluntary blood donation is undoubtedly, the greatest service to mankind as it can save many precious lives every single day.

One single blood donation can help many patients as blood is usually segregated into red blood cells (RBC's), Platelets, white blood cells (WBC's) and Plasma, and transfused according to the requirement.

**Material and Methods:** The present study was undertaken in the Department of Blood Bank, retrospectively from 2011 to 2017. The study was conducted on both voluntary and replacement blood donors who came to our blood bank and voluntary blood donation camps in and around Chamba. All the blood donors, donating blood in the blood bank were considered as the study population.

**Results:** In our study, comparison of voluntary donors and replacement donors was done. There were 1261 voluntary donors (21 %), where as there were 4687 replacement blood donors (79 %) in our study. On the whole, there were 5676 male donors, forming 95 % and 272 female donors (5 %) in our study.

**Discussion:** As per our study, the total number of replacement donors is much higher (4687, 79 %), than voluntary donors (1261, 21 %). From the present study, it was seen that in replacement blood donation, there were only 61 females (1 %), in comparison to 4626 male donors (99 %). Therefore, the number of replacement female donors is significantly low in our blood bank. The number of female gender in voluntary donation (211, 17 %) was found to be much greater than in replacement donation (61, 1 %) in our study.

**Conclusion:** From our study, we concluded that the percentage of voluntary donors is quite low, in comparison to replacement blood donors. Ideally, there should be 100 % voluntary blood donation, but in practical terms, it is not quite possible, especially in rural tertiary care centre like ours, where there is complete lack of awareness about health and voluntary type of blood donation.

### Introduction

Voluntary blood donation is undoubtedly, the greatest service to mankind as it can save many precious lives every single day.

One single blood donation can help many patients as blood is usually segregated into red blood cells (RBC's), Platelets, white blood cells (WBC's) and

Plasma, and transfused according to the requirement.

The demand for blood is constantly rising all over the world. For a world population of 6,910 million, with annual requirement of 150 million units, only 88 million units of blood are available, therefore, it can be said that, demand for blood is much higher than the blood supply. However, in some developed nations, sufficient number of voluntary blood donors are available, like Switzerland, where there are 113 voluntary blood donors per, 1000, in Japan, the number is little lower with 70 donors for every 1,000 population. But, in India, the number of voluntary donors is very low, having only 8 per 1000 population.<sup>1</sup>

Blood donation is the cornerstone of any blood transfusion system. However, the thrust nowadays is on Voluntary donation, as it is considered as the healthy blood. In India any healthy person between the age of 18 and 60 years, irrespective of gender, can donate blood in blood bank. After the Supreme Court judgement passed in 1998, no paid/ professional blood donor is permitted in India, for any reason whatsoever.<sup>2</sup>

Broadly saying, there are two types of blood donors

#### **Voluntary blood donor**

The person who donates blood not for any particular patient and seeks nothing in return is called a voluntary donor .The incidence of transfusion – transmitted disease is much less in blood drawn from voluntary donors. They are the best type of donors and act as lifeline of any blood transfusion service. Such recognition of donor is universally accepted.<sup>3</sup>

#### **Replacement blood donor**

The donor who donates blood as a replacement for some of his relative or friend is a replacement donor. The majority of the blood supply in the blood banks in developing countries comes from replacement donors. In present scenario, blood bank provides the required group of blood for the patient and replacement donor belonging to any other blood group replaces the blood unit quantity.<sup>3</sup>

Blood donation is quite safe and now proven to be a healthy practice that helps in blood renewal. The volume of blood donation is about 350-400 ml, almost 7.5% of the adult blood volume which is compensated in a short duration of time.

In India, National Blood Policy has been formulated with national goal to achieve 100 % voluntary blood donation and also to bring an end to replacement donation.<sup>4</sup> In 2008, India reported rise in the number of voluntary donors from 3.6 million in 2007 to 4.6 million in a report submitted to the WHO for global data on blood safety.<sup>5</sup> Various studies reported from different parts of India show that many blood banks still rely on Replacement type of donors to maintain adequate stock.<sup>6,7,8,9</sup> This points towards the fact, that in India, national blood policy is not uniformly implemented, since blood donation services are mainly hospital based and highly decentralized.

We conducted this study, to find the prevalence of voluntary donors and replacement donors in our blood bank, to compare voluntary – replacement donors year wise and gender wise, and also to study the pattern of both, voluntary and replacement donors over the period of time. Also, this kind of study has not been done earlier in this region, and it would help in generating data for health planners with versatile utilities in near future.

#### **Material and Methods**

The present study was undertaken in the Department of Blood Bank , retrospectively from 2011 to 2017. The study was conducted on both voluntary and replacement blood donors who came to our blood bank and voluntary blood donation camps in and around Chamba. All the blood donors, donating blood in the blood bank were considered as the study population. The family members, friends or relatives of the patients were categorized as replacement donors. People who donate blood without expecting any favor in return or in voluntary blood donation camps were classified as voluntary blood donors.

Donors were screened by the standard criteria for donor fitness. They were carefully selected for donation by trained personnel after medical examination and a detailed pre donation questionnaire form which included the donor register form, information regarding risk factor such as history of surgery, previous illness, hospitalization, and blood transfusion.

**Inclusion Criteria**

Clinically healthy individuals between 18 and 65 years of age with a body weight of above 45 kg and hemoglobin more than 12.5 g/dl with no significant medical or surgical history were qualified for the donation process.

**Exclusion Criteria**

Persons belonging to high-risk groups such as patients with chronic diseases, professional blood donors, drug abusers, dialysis patients, pregnant women, patients treated in thalassemia clinics, sexually transmitted disease clinics, and sex workers were excluded from the donation process. After the blood collection, donor samples were obtained for serological testing. TTI screening

was done using rapid test kit for all 5 TTI, based on the principle of one step immunoassay.

Data was analysed using Ms Excel and SPSS version 20.

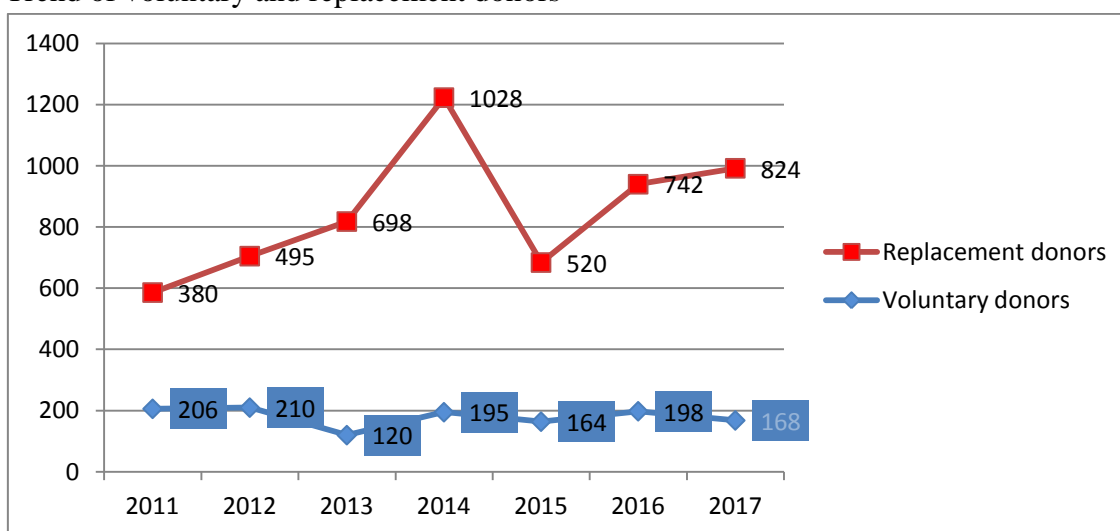
**Results**

**Table 1-** Year wise distribution of blood donors

Year	Total donors
2011	586
2012	705
2013	818
2014	1223
2015	684
2016	940
2017	992
Total	5948

As in table 1, we can observe, there were 586 blood donors in the year 2011. There was a gradual rise in the number of blood donors, from 2011 to 2014, with 705 donors in 2012, 818 in 2013, 1223 in 2014. From 2014 to 2015, a decline in number of donors was observed, as there were 684 donors in 2015, much lower than 2014. From 2015 to 2017, a rising trend was noticed in blood donor number with 684 donors in 2015, 940 in 2016, and 992 donors in the year 2017.

**Graph 1-** Trend of voluntary and replacement donors



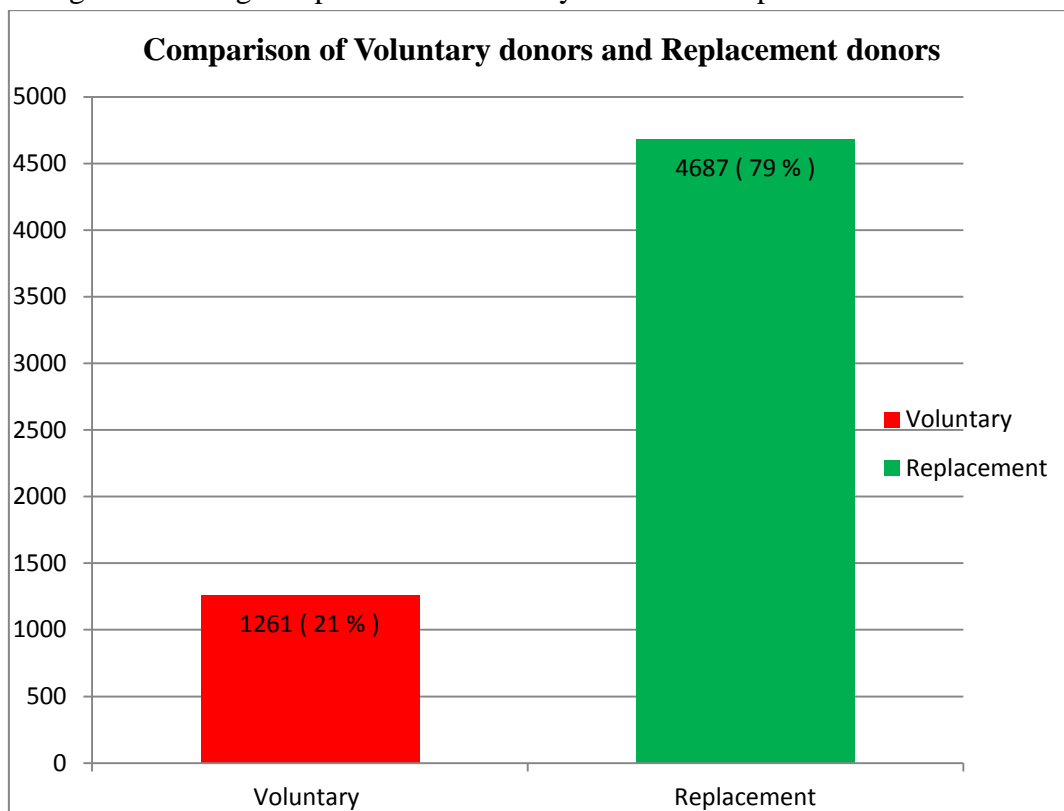
The above graph shows trend of voluntary and replacement donors over the study period. There were 380 replacement blood donors in 2011, showing a rising trend with 495 in 2012, 698 in 2013, and 1028 donors in the year 2014. From 2014 to 2015, there was a decline in number of

blood donors, with 520 in 2015. From 2015 to 2017, there was a rise in number of donors, from 520 (2015) to 742 (2016) to 824 in 2017. We also observed the trend of voluntary blood donors in our study. There was a slight rise from 206 donors in 2011 to 210 in 2012, and then a decline with

120 donors in 2013 with a small rise in 2014 ( 195 donors ), again a decline with 164 donors in 2015,

then a small rise in 2016 (198), and a decline in 2017 with 168 blood donors.

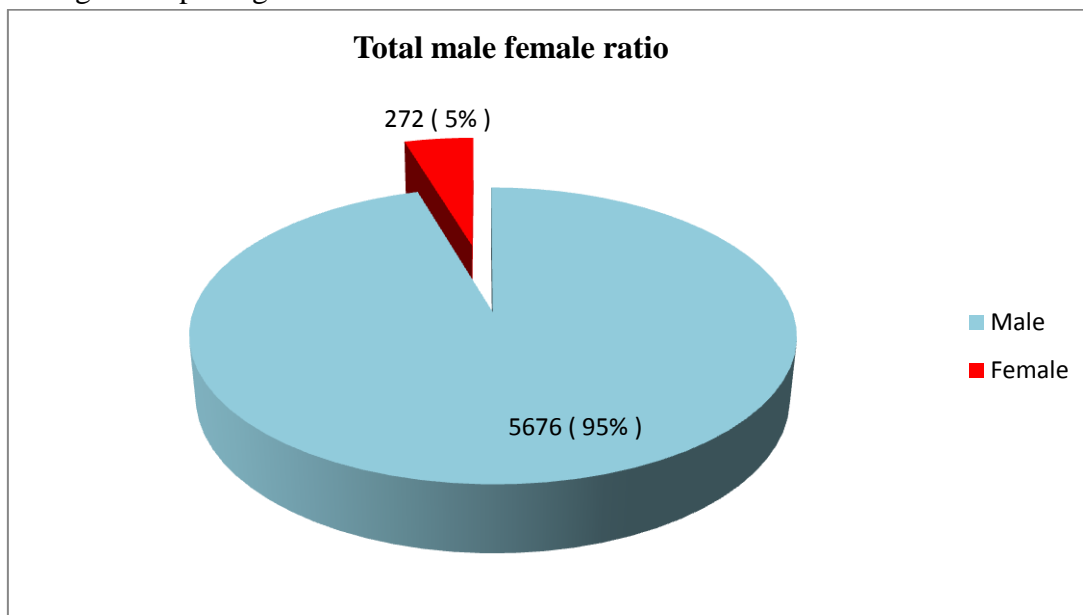
**Graph 2-** Bar diagram showing comparison of voluntary donors and replacement donors



Graph 2 shows comparison of voluntary donors and replacement donors. There were 1261 voluntary donors (21 %), where as there were

4687 replacement blood donors (79 %) in our study.

**Graph 3-** Pie diagram depicting total male female ratio



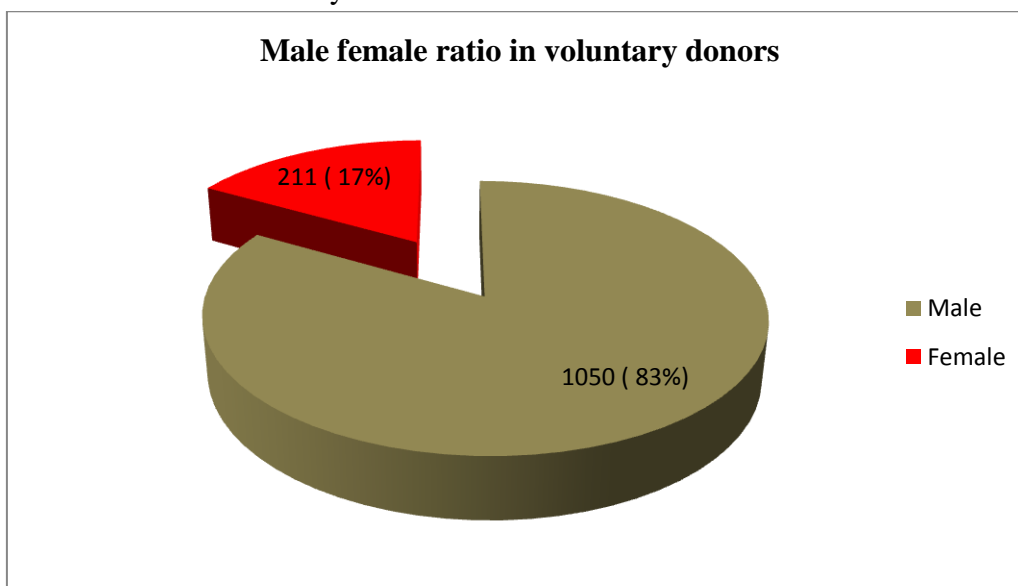
The above graph shows total male – female ratio. On the whole, there were 5676 male donors,

forming 95 % and 272 female donors (5 %) in our study.

**Table 2-** Gender wise distribution of voluntary and replacement donors

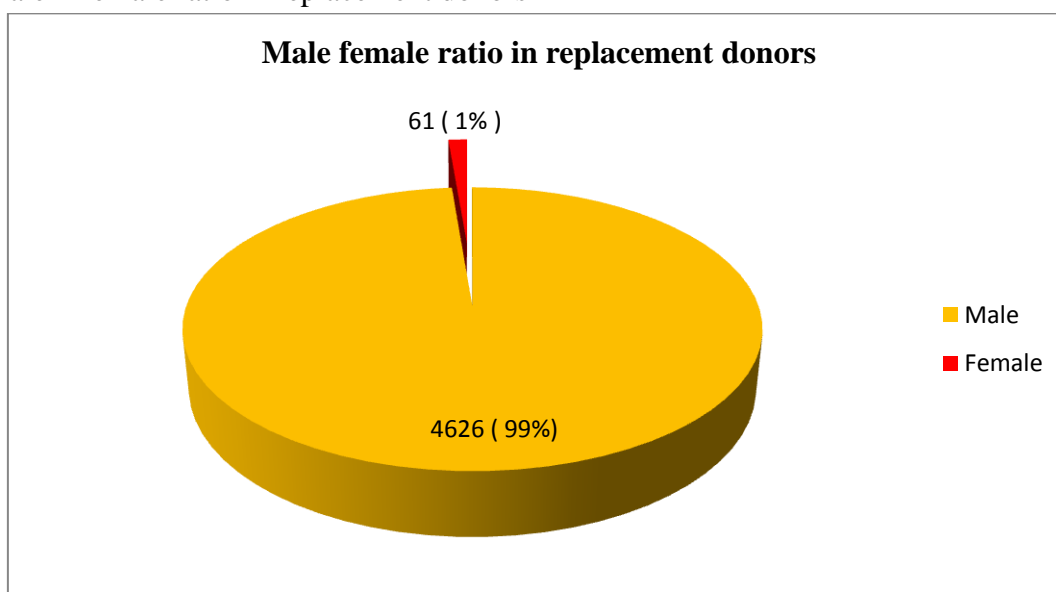
Year	Total donors	Voluntary donors		Replacement donors	
		Male	Female	Male	Female
2011	586	167	39	376	4
2012	705	168	42	489	6
2013	818	85	35	682	16
2014	1223	153	42	1016	12
2015	684	151	13	516	4
2016	940	172	26	728	14
2017	992	154	14	819	5
Total	5948	1050	211	4626	61

**Graph 4-** Male female ratio in voluntary donors



As in the above graph, it can be observed, there were 1050 voluntary male donors forming 83 % and 211 female voluntary donors, forming 17 % in our study.

**Graph 5 -** Male - female ratio in replacement donors



In the graph 5, there were 4626 male replacement blood donors (99 %), and 61 female replacement donors (1 %) in our study.

## Discussion

Voluntary blood donation is the cornerstone of a safe and adequate supply of blood transfusion system. The safest blood donors are voluntary which are non-remunerated and belong to low-risk populations. In India, collection of blood from professional donors is strictly prohibited by law and only voluntary donors, with or without replacement is accepted.

In our study, there were a total of 5948 blood donors, comprising of both voluntary donors and replacement donors. On the whole, there was a gradual increase in the number of total blood donors from the year 2011 till 2017 in present study. Similar study was reported by Sehgal PK et al<sup>10</sup>, showing rise in total number of blood donors in their study with 26353 total blood donations in 2007 to 40293 in 2016.

As per our study, the total number of replacement donors is much higher (4687, 79%), than voluntary donors (1261, 21%). In North India, proportion of voluntary donors, varies from 9.11 % to 52.3 %<sup>11</sup>. Awasthi et al<sup>9</sup> also showed similar findings, with 85.19 % R.D. Singh et al<sup>12</sup> also had comparable results with 82.4 % R.D. Higher proportion of replacement donors were observed by Yadav et al<sup>13</sup> ( 92 % ) and by Chatteraj et al.<sup>14</sup> Arya et al<sup>15</sup> showed in their study, there were much higher number of voluntary donors, forming 87 %. Similar studies were done in Western India by Patel et al<sup>16</sup>, Shah et al<sup>17</sup> and by Khamankar et al<sup>18</sup>. Our study does not match with these studies as we had majority of RD in our study, in contrast to majority of VD in these studies.

When we studied the trend of replacement blood donors, there was a rise in their number from 2011 to 2017. On the contrary, there was a decline in number of voluntary blood donors in the study period, with 206 VD in 2011 falling to 168, in 2017. Our study is in disagreement with study by Sehgal et al<sup>10</sup>, as they reported an increasing trend in voluntary donors, and a decreasing trend in replacement donors, whereas the opposite results were noted in present study.

When we compared female donors with male donors in our study, we observed that there were very few females, constituting only 5 % in total blood donation. Number of male blood donors is much higher (5676), forming 95 % of total donors. Similar studies were reported earlier in India, showing much higher number of male donors, and very few females in blood donation.<sup>6,14,15,17</sup>

Some studies done in developed nations reported that female donors were higher than male donors, dissimilar to our study.<sup>19,20</sup>

From the present study, it was seen that in replacement blood donation, there were only 61 females (1 %), in comparison to 4626 male donors (99 %). Therefore, the number of replacement female donors is significantly low in our blood bank.

The number of female gender in voluntary donation (211, 17%) was found to be much greater than in replacement donation (61, 1 %) in our study. Similar study was reported by Bala SS et al<sup>21</sup> with higher number of female donors in outdoor blood camps than in blood bank.

For a safe blood service in our country, especially in rural sector where elaborate laboratory tests are not available, it is best to change over to 100% voluntary donation, as now it is a known fact that only voluntary non-remunerated blood donation is the safest. According to our study, Voluntary blood donation forms a very small proportion in our blood bank, in comparison to replacement donation, despite the fact that we are encouraging and promoting only the voluntary type of donors. Therefore, it becomes all the more important for us that we take even greater effort in phasing out replacement blood donation, so that percentage of voluntary blood donors rises in our blood bank. In addition, we should organize voluntary blood donation camps actively on regular basis along with blood donation awareness programmes to motivate the people for voluntary blood donation. It can be seen in our study that female gender showed poor participation in blood donation. Therefore, there is a great need for bringing

female sex at par with males in blood transfusion process. It may be made possible by strong degree of motivation, education and counseling of female community with the help of blood donation awareness campaigns. In addition, females should also be taught about dietary methods to prevent anemia, and significance of iron, folic acid tablets for treatment, as majority of females have low Hb, deferring them from blood donation.

### Conclusion

From our study, we concluded that the percentage of voluntary donors is quite low, in comparison to replacement blood donors. Ideally, there should be 100 % voluntary blood donation, but in practical terms, it is not quite possible, especially in rural tertiary care centre like ours, where there is complete lack of awareness about health and voluntary type of blood donation in community. To improve the voluntary replacement donor ratio in our community, we have to raise their level of health awareness. We need to educate the people about blood donation, and benefits of voluntary blood donation with the help of blood awareness campaigns. We should encourage them to come forward for blood donation, on voluntary basis. We should hold voluntary blood donation camps more frequently, both outside and in blood bank, so that we manage to receive a much higher percentage of voluntary blood donors and bring replacement blood donation to minimal. Also, we need to impress upon the female community about significance of blood donation, importance of healthy lifestyle, dietary methods to prevent anemia. Iron, folic acid tablets should be distributed to females with low Hb, free of cost, in OPDs and medical camps to overcome anemia in them, as anemia is quite prevalent in our region, more so in female gender. Only when females are healthy, and their Hb is greater than 12.5 gms, they can contribute actively in the process of blood donation, voluntarily.

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