Introduction of a program for voluntary blood donations in Iran (blood transfusion status in Iran)

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Background A national and well-coordinated system is very effective for blood self-sufficiency of a country; this system might be committed to follow all requirements and standards. It should manifest itself strong and well-established in reality and practice so that all potential donors trust it and contribute. Iranian Blood Transfusion Organization (IBTO) is an example of a centralized network with 200 centers in 31 provinces which could only be decentralized in some aspects of blood donor recruitment based on the cultural and regional attributes of the people there.

Methods The mission of IBTO is to provide and ensure a safe and adequate blood supply in Iran. Selection of low risk donors in pre-donation consultation and interview sessions based on behavioral, medical and demographic factors has improved the transfusion safety even before specific lab screening tests have been conducted; Standardization of criteria for donor eligibility and exclusion, and donor screening procedures are all priorities and most importantly the collection of all blood donations just from voluntary non-remunerated (VNR) blood donors. In fact, a lot of efforts concentrated on recruitment of VNR donors and to this end the Blood Donor Recruitment and Retention Office was established. A variety of measures were made to increase the number of voluntary regular donors including technical efforts, information dissemination activities, demographic studies, campaigns, awareness raising programs, publicity, publications, commemorative ceremonies and the like.

Results The annual donation index in Iran has greatly increased from 0.39 in 1974 to 25.3 in 2010–2011. Accordingly we have been witness to increasing trend of blood donation reaching about 2 million blood units in 2011, all of which obtained from voluntary non-remunerated blood donors with the annual index of 26 per 1000 population.

Conclusions It shows that every country based on its needs should establish a very effective and safe program to raise the number of its voluntary blood donors and to this end centralization of activities monitored by a headquarters and implementation of an efficient recruitment plan by which all aspects are covered and monitored: ranging from stages prior to donor selection including campaigns and activities to motivate populations to embark on donation, donor selection, screening, retention, statistical audit, continuous evaluation of donation sites, ease of access to donation centers, demographic attributes, donor reactions, to post...
Blood transfusion is a life saver playing a pivotal role in medical interventions and health care system including major surgeries, trauma and organ transplantation; even blood transfusion is a major part of disaster preparedness [1–3]. Furthermore, blood products are main elements of medical care for those patients suffering from malignancy and also for those requiring long term blood components therapy such as those affected by major thalassemia. In other hand, since there is no alternative for most of blood components especially red blood cells, it is necessary to have a system at a national level responsible for blood to meet community need so as to provide adequate, available and affordable cellular blood components or products obtained from blood plasma [1,4,5].

World Health Organization continually emphasizes the central role of blood transfusion establishments as a part of health care and urges the achievement of self-sufficiency for safe blood components. There are lots of developing countries facing serious challenges in blood supply. In fact, blood transfusion establishment must ensure the quality and safety of blood products in the face of known and emerging, newly emerging or re-emerging infectious pathogens so as not to be transmitted to recipients and not to disturb the confidence of people [4,6,7].

To ensure blood safety and adequacy every country has to meet some requirements including a nationally coordinated and well organized blood transfusion establishment with a strong commitment by the government or policy makers, a practical plan for blood donor recruitment, retention and education based on collecting whole blood from voluntary non-remunerated donors targeting from low risk populations, screening donors’ samples for at least HBV, HCV, HIV and syphilis, implementation of GMP throughout the entire blood transfusion system and finally appropriate clinical use of blood and blood components by controlling blood wastages in hospitals and clinics [7–9].

**Iranian Blood Transfusion Organization (IBTO)**

Iran is a large country in the world (the 18th largest in the world) in terms of area with 1 648 000² km ranging from Caspian Sea in the north to the Persian Gulf in the south and it is geographically divided to 31 provinces. Iran is a country with over 73 million populations and it is one of the most populated countries in the Middle East. IBTO established in 1974 is a single nonprofit organization which is responsible for the nation’s blood supply and it is the only nationally accredited entity performing blood transfusion procedures ranging from blood donor recruitment to blood distribution. However, blood transfusion history in Iran goes back to 1940s [4–6].

IBTO is a national and centralized organization with blood centers across Iran in all provinces and cities and fully relies on the government budget. The main IBTO vision is to be a prominent internationally recognized organization, focusing on the improvement of health through advanced sciences and practice of transfusion medicine. The mission within IBTO is to supply sufficient and safe blood products, in order to maintain and promote healthy lifestyle. To this end every province throughout Iran has its own blood transfusion establishment as a regional blood transfusion service and there are some satellite blood centers throughout provinces considering population size, extent of the province, the number of medical universities, hospitals and clinics, the number of multi-transfused patients, the number and type of clinicians (specialty or sub-specialty), the number of active hospital beds, the number and size of disasters, distance among cities, the number of known or incoming sophisticated and specialized hospital wards such as transplantation, open heart surgery, chemotherapy, trauma units, and the availability of transportation substructure [4,6,10,11].

Since the establishment of IBTO we have been witness to an increase in the number of blood centers from 6 to 7 in the scratch to more than 200 in 2011 across the country. As in the rest of the world the most important reason behind large IBTO expansion was a war and in our case the imposed Iraq war against Iran and IBTO had to meet all requirements for the battle field and wounded soldiers and people. There are 117 fixed collection centers with the responsibility of collecting blood from VNR blood donors and doing associated activities including donor recruitment and recall, assessment of donor suitability and donor care. The other 89 out of the total number of blood establishments carry out blood collection, testing for TTIs and blood grouping, processing of blood components, storage, distribution to other blood centers and hospital blood
blood banks within a defined region, the clinical use of blood and surveillance of adverse transfusion events [4,6,10].

IBTO is a nationally centralized establishment in major activities and requirements including SOPs, guidelines, evaluation policies, external quality assurance methods, procurement of kits for blood screening, blood bags, major equipment and devices like refrigerated centrifuges, blast freezers, automated instruments, group typing tools, etc. IBTO is however regionally decentralized in blood donor recruitment policies where some procedures are needed to be tailored according to cultural and social issues of relevant regions; add to it a few different measures in regard to screening tests, preparation and distribution of blood products to end users. Entire activities throughout all blood transfusion centers are managed, coordinated, monitored and supervised by the headquarters in Tehran. Based on IBTO top chart there is an IBTO high council headed by minister of health and medical education; the council consists at least of five experts in transfusion medicine or related sciences, one of whom appointed as IBTO managing director (Fig. 1) [4,6,10].

**Donor recruitment and blood collection: only voluntary non-remunerated blood donors**

The first key factor in blood safety is to have a pool of VNR blood donors for every blood transfusion establishment. IBTO is witnessing the transition of blood donor types in Iran from paid donors before 1974 to mixed picture of VNRBD and family-replacement blood donation until 2007 and since this period IBTO has come to decision of ruling out the small percentage of the family-replacement blood donation (4% in 2004, 3% in 2005 and 1% in 2006) and finally succeeded to achieve 100% VNRBD in 2007 (Fig. 2) [10–13].

There was a well adopted program and commitment within IBTO for introducing and incorporating this issue. To this end, Blood Donor Recruitment & Retention Office in IBTO headquarters was established with responsibility for introducing a national work plan, marketing and monitoring all programs associated with donor recruitment and

![IBTO's High Council](image1)

Fig. 1 Iranian Blood Transfusion Organization (IBTO) top chart that has been approved in 2012.

![Blood transfusion status in Iran](image2)

Fig. 2 Trend of Voluntary Blood Donation in Iran from 2001 to 2011.
care. Then every provincial blood transfusion service in Iran established the same office in a smaller size. The main activities of these offices are to identify the specific characteristics and motivations of different target populations, identify a focal point/contact person for each target population or group to maintain good communication and strengthen public contribution and involvement, tailor the donor communication and education strategy to suit each target population, work with community service organizations, target donor populations through faith-based organizations, youth and women's organizations, educational institutions, sporting and cultural groups, workplaces, commercial enterprises and rural communities, collaborate with with NGOs, and prepare SOPs for donor selection, education and retention that must be followed by all blood transfusion centres as a nationwide plan [10–14].

Other objectives for this key element in blood safety include launching a partnership with the mass media for raising public awareness about blood transfusion activities and the importance of blood donation, face to face training, publishing marketing materials including books, brochures, pamphlets, CDs and posters, adding certain educational topics on blood and blood donation to books in schools, organizing mobile drives in safe places, increasing the number of blood collection centers, improving the blood collection premises as clean, tidy and modern environments, developing telephone recruitment programs to bring back lapsed donors to blood centers organizing, campaigns on key role figures or leaders for blood donation, establishing a work plan and SOPs for shipping blood components from the provinces with high donation rate to other places with lower rate, implementing a short-term iron supplementation strategy for female blood donors, launching a program specified for regular blood donors by identifying and appreciating them during special occasions including National Blood Donation Day or World Blood Donation Day and publishing an educational pamphlet for them (in 2011 when the percentage of regular blood donors in Iran was 49%, Fig. 3), implementing a nation-wide software for blood centers for proper identification of those willing to donate blood and preventing re-entrance of temporary or permanent deferral blood donors, continuously monitoring and evaluating the donor deferral rate and the reasons, providing informative materials about high and at risk behaviors, doing call-for through SMS, email, and phone, issuing color cards for regular donors, and awarding medals to record blood donors [10–16].

After more than three decades of effort and commitment, the rate of blood donation increased from 20909 units in 1974 to roughly of two million in 2011 (Fig. 4).

The annual donation index in Iran has greatly increased from 0.39 in 1974 to 26 in 2011 (Fig. 5). IBTO succeeded to raise the trend of voluntary blood donation from 64% in 1997 to 100% in 2007, while few countries in Asia have succeeded to collect blood from 100% VNR blood donors [10–13].

Moreover, there are motives for Iranian people in special holy days like Ashura (the martyrdom day of grandson of the prophet of Islam) or Lailatol–Ghar (the day of Quran descending) in Ramadan that IBTO makes use of to recruit voluntary blood donors. Each year IBTO embarks on holding the World Donor Day. IBTO also holds annually a separate blood transfusion day that coincides with IBTO establishment anniversary [10–13].

As the Figures 4 and 5 show the percentage of blood donation per population has raised because of the population age, life expectancy increment, health care system improvement, increment in the number of hospitals and professionals, increase in the number of specified hospital
wards using more blood products such as open heart surgery, transplantation departments, cancer therapy centers, and disaster preparedness [3,5,10].

The pattern of blood donation in the last decades in Iran has contributed to an increase in the overall number of blood donations and blood donors and there is a positive change in VNR blood donation transition by which family-replacement has been ruled out since 2007. However, in spite of the fact that the number of blood donations has dramatically increased based on community need and IBTO succeeded to achieve 100% VNR blood donations, IBTO is still facing some challenges in female donor recruitment. Although the percentage of female and male populations are roughly equal but the proportion of male blood donors compared to female blood donors is significantly higher. Obtained results from some studies conducted by IBTO-Research Center showed some common beliefs including contamination to TTIs through blood donation, needle fear, blood donation impact on fertility or anemia and the lack of accessibility of blood collecting units to female population as the main obstacles. However, this difference might be also attributed to 450 or 350 ml blood bags, accessibility and feasibility of male donors compared to female donors, and fear of unwanted events during blood donation in female donors that can be more time consuming for blood services [15,17,18].

Availability and affordability are also important issues in IBTO. Every regional blood transfusion center should meet community need for blood products and there is a well-established program for extra demands to be met through blood components transfer. No charges apply for collecting, testing, processing, storing and shipping blood components [4–6].

Finally, every country or even different parts within the country should design their own effective programs for donor recruitment and retention based on socio-economic background, cultural diversities, and prevalence of TTIs and different age patterns. Since the scientific evidence for donor motivation, donor altruism or donor recruitment for introducing any effective program are necessary, every country should perform some research about blood sufficiency and safety [2,8,11–14,17,18].

Disclosure
No potential conflict of interest to declare.

References

1 Gharehbaghian A: An estimate of transfusion-transmitted infection prevalence in general populations. Hepa Mon 2011; 11(12):1002–1003


17 Khadir M, Maghsudlu M, Gharehbaghian A: Evaluation of the attitude of Iranian women towards blood donation in eight provinces. Vox San 2004; 87(Suppl 3):s93–s145
