

## Effect of Orientation Program on Undergraduate Nursing Student's Performance regarding Blood Donation

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### Abstract

**Background:** Despite the growing demand for blood and its products, some people, particularly the youth, are reluctant to donate blood. **Aim:** To evaluate the effect of the orientation program on undergraduate nursing students' performance regarding blood donation. **Subjects and method: Design:** A quasi-experimental research design was used to achieve the aim of this study. **Setting:** The study was conducted at the Faculty of Nursing, Minia University, Egypt on the undergraduate nursing students. **Subjects:** The sample consisted of convenient 900 undergraduate nursing students selected from the previous setting. **Tool:** A self-administered related questionnaire was designed using an electronic survey (Google form) which included four parts: Part I: undergraduate nursing students' demographic characteristics, Part 2: undergraduate nursing students' knowledge regarding blood donation, Part 3: undergraduate nursing students' attitudes regarding blood donation, Part 4: undergraduate nursing students' practices regarding blood donation. The link to the survey was sent to the respondents via WhatsApp groups. **Results:** The study result revealed that more than one-third of studied undergraduate nursing students had a poor level of knowledge, and more than half of them had an inadequate level of practice about blood donation before the implementation of the program. The majority of students had a good level of knowledge and most of them had a satisfactory level of practice after implementing the program. There was a highly statistically significant difference and improvement in undergraduate nursing students' knowledge, attitude, and practice after program implementation than pre-implementation. **Conclusion:** The findings of the study concluded that orientation program had positive effects on improving undergraduate nursing students' performance regarding blood donation. **Recommendations:** The study recommended organized blood donation orientation program are required to increase undergraduate nursing students' knowledge, attitudes, and practices toward blood donations.

**Keywords:** Blood donation, Undergraduate nursing students, Performance.

### Introduction

Blood transfusion is very important in the concept of health care, as it protects the lives of millions of people annually all over the world. Blood transfusion allows for many challenging operations that improve efficiency and average life span in those patients who suffer from many serious chronic conditions and acute illnesses (Al-Dorzi et al., 2019). The people's need for blood is increasing daily due to the increasing population and advancements in medical sciences. Saving lives could be the ultimate humanitarian gift (Amatya, 2019).

Blood safety, and thus people's health, will be jeopardized if safe and sufficient blood is not collected through voluntary blood donation. The

only way to meet the rising demand for safe blood and its availability in Iran is to promote voluntary blood donation. Several studies have found that different groups of people and age groups have varying levels of awareness and attitudes toward blood donation. As a result, national blood transfusion centers prioritize raising public knowledge about blood donation and encouraging a favorable attitude toward blood donation (Sevgi et al., 2016).

According to several studies, stressing the health benefits of blood donation can help people become more motivated to donate blood. For example, Bednall and Bove (2019) investigated self-reported blood donation motivators and deterrents and found that blood donor who was aware of the health advantages of blood donation

were more likely to donate blood in the future. Other research has looked at the elements that influence and predict blood donation and has even created instruments (questionnaires) to analyze these issues. Many of these researches have only looked at blood donors or the general community. The attitudes, knowledge, and conduct of university students concerning blood donation have been researched to a lesser extent (**Jalalian et al., 2020**).

According to research on the factors that influence blood donor recruitment and retention, sociodemographic, organizational, physiological, and psychological factors all influence people's willingness to donate blood (**Mousavi et al., 2018**). Because the number of active blood donors has declined in recent decades, the rising need for blood transfusions cannot be met. Furthermore, most people do not donate blood freely; they only do so for family members or friends who require a transfusion. Only a small percentage of blood donors are compensated. Furthermore, especially in developing countries, the issue of blood donation and transfusion safety, such as avoiding transfusion-transmissible infections is a major worry; as a result, blood transfusion is restricted to close relatives with extra precautions (**Abdel Gader et al., 2019**).

Donating blood is regarded as a charitable act that is typically carried out as a selfless service with no expectation of payment. The World Health Organization has asked communities to increase their ability to donate blood freely and without remuneration, recommending that at least 1% of the population in each country donate blood (**World Health Organization, 2020**).

Donor selection is a critical component of improving the overall safety of the blood supply. Young and educated people are thought to be safer blood donors since their risk of transfusion-transmissible illnesses is thought to be lower. Despite the fact that donated blood is always subjected to thorough suitable testing in accordance with World Health Organization regulations, the possibility of transfusion-transmissible pathogens remains (**Burg et al., 2018**).

According to a study conducted in the Pakistani city of Faisalabad and published in 2018, 89.8% of female participants had never donated blood and only 0.4% had donated blood

regularly (**Tariq et al., 2018**). In Ethiopia, a study conducted in 2018 showed that most of the participants had adequate knowledge about and a positive attitude regarding blood donation. In the Kingdom of Saudi Arabia (KSA), a study done found that blood donors had more knowledge about blood donation when compared no donors (**Melku et al., 2018**). A study conducted between 2014 and 2015 found that most respondents had sufficient knowledge about blood donation. Of them, 99.2% believed that blood donation is important for the community, and 30.1% had donated blood previously, according to the study (**Alsalmi et al., 2019**).

A study was done in the Hail region in 2017 to investigate the knowledge, attitude, and practice (KAP) about blood donation among undergraduate medical students. The study discovered that awareness was low due to a lack of knowledge about blood donation and that only a few of them had donated blood; however, medical students had a positive attitude toward blood donation (**Alanazi et al., 2018**).

Another survey conducted in the same region in 2018 indicated that 75% of people were aware that viruses can be spread by blood donation, and one-third thought the minimum hemoglobin level for blood donation is 12.5 g/L in men and 12 g/L in women. Negative attitudes toward blood donation included a donation to relative request only (24%), paid donations (29.7%), and belief in the probability of getting infected (34%) (**Chauhan et al., 2019**).

University students, whose educational background and socioeconomic status are usually higher than the general population, are generally considered safer donors. Specifically, those who study in the medical and paramedical fields are considered safer donors because of their background knowledge and healthier lifestyle, which make them much less likely to transmit infectious diseases. Furthermore, university students, especially those in the medical and paramedical fields, are expected to be more knowledgeable about the significance of blood donation, donate blood more frequently, and have a better attitude towards it (**World Health Organization, 2020**). Thus, the present study aimed to evaluate the effect of orientation program on undergraduate nursing students' performance regarding blood donation.

**Significance of the study:**

Blood donation rates in low-income countries are 4.4 donations per 1000 people, 8.1 donations per 1000 people in lower-middle-income countries, 15.1 donations per 1000 people in upper-middle-income countries, and 32.6 donations per 1000 people in high-income countries, according to the World Health Organization (Yaddanapudi et al., 2018).

Increasing the level of knowledge, awareness, attitude, and practices in the community regarding blood donation is the highest priority for the bank center. Transfusion of blood and blood components is the ultimate choice for several emergency cases such as accident-related hemorrhage, surgical-related bleeding, or chronic diseases such as severe anemia, malignancy, and thrombocytopenia. The rates of regular donors vary dramatically from country to country affected by factors other than income including, culture, beliefs physiological, and psychological matters (Mousavi et al., 2018). Hence, the researchers aimed to evaluate the effect of the orientation program on undergraduate nursing student's performance regarding blood donation

**Aim of the study**

To evaluate the effect of the orientation program on undergraduate nursing student's performance regarding blood donation through:

- Assessing undergraduate nursing students' knowledge about blood donation.
- Assessing undergraduate nursing students' attitudes toward blood donation.
- Assessing undergraduate nursing students' practices regarding blood donation.
- Designing and implementing orientation program based on the undergraduate nursing student's needs.
- Determining the effect of orientation program on undergraduate nursing student's performance regarding blood donation.

**Research hypothesis:**

The orientation program will have a positive effect on improving the knowledge, attitude, and practices coping of undergraduate nursing students regarding blood donation.

**Subjects and Method:****Research design:**

A quasi-experimental research design was used to achieve the aim of this study.

**Setting:**

The study was conducted at the Faculty of Nursing, Minia University, Egypt on the undergraduate nursing students.

**Subjects:**

The sample consisted of convenient 900 undergraduate nursing students selected from the previous setting. The sample size included undergraduate nursing students who completed online tools via Google Form that was opened from 30 October to 14 November 2021 for about fifteen days after the link was closed.

**Data collection tools:**

**Tool:** A self-administered related questionnaire was designed using an electronic survey (Google form), which was developed by the researchers after reviewing the related literature and research studies (Mousavi et al., 2019; Tariq et al., 2018; Melku et al., 2018); it consists of 38- items. The survey was electronically distributed to the participants in the study [https://docs.google.com/forms/d/e/1FAIpQLScwZEacH710kZVtuYIiJ1E3PO5CdECmpdDS5JIPZ\\_w0Zw/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScwZEacH710kZVtuYIiJ1E3PO5CdECmpdDS5JIPZ_w0Zw/viewform?usp=sf_link) which included three parts:

**Part 1: Undergraduate nursing students' demographic characteristics** were designed to collect data on the study of undergraduate nursing students' characteristics (age, academic year, attending any blood donation educational program, and preferred methods of receiving information regarding blood donation).

**Part 2: Undergraduate nursing students' knowledge regarding blood donation:** It was developed by the researcher after post-reviewing recent literature. It consisted of (10) closed-ended questions to assess student knowledge about blood donation such as definition, causes, and complications of blood donation, what is the amount of blood contained in the human body, what are the components of blood, what is the right age

for blood donate, what is the appropriate weight for the person who donates blood, amount of blood a person can donate in a single time, blood group and types, different types of blood donors...etc.

**The scoring system:** The knowledge section consisted of multiple-choice items, each with four choices for the answer. The correct answer was given a score of one, and the wrong answers were given a score of zero. Thus, the total knowledge score ranged between zero and 10. The total knowledge score was 10 and was categorized as a total score < 6 scores (less than 60%) was considered unsatisfactory while a score of >6 scores (60% and more) was considered a satisfactory level

**Part 3: Blood donation Attitude Scale.** This scale developed by **Manikandan, et al., (2013)**. The scale included statements to assess students' attitudes regarding blood donation. It consisted of 8 statements such as blood donation is charitable or voluntary, I think blood donation is a positive behavior; parents should be informed before donation of blood, I think blood donation can lead to anemia, and willingness to donate blood for the future, willingness to donate blood to an unknown person if asked, willingness to become regular donor, and willingness to tell the family if donated blood.

**The scoring system of attitude for blood donation:** The blood donation Attitude Scale categorized into positive attitude statements was scored from two (for participants who agreed) to zero (for participants who disagreed). The blood donation Attitude Scale was categorized into positive attitude statements and the opposite of this scoring was used for the negative attitude statements. Accordingly, the total score ranged between zero to 8 points. A total score of < 4 scores (less than 60%) was considered a negative attitude while a score of >4 scores (60% and more) was considered a positive attitude toward blood donation.

**Part 4: Undergraduate nursing students' reported practices** regarding blood donation. The link to the survey was sent to the respondents via WhatsApp groups. It consisted of 8 statements such as; frequencies of blood donation, precautions before blood donation, precautions during

and after blood donation, contraindication of blood donation, Normal blood pressure for the donated person (mmHg), laboratory investigations before donation, laboratory investigations after donation, food and medications after blood donation.

**Scoring system:** The undergraduate nursing students' reported practices were assessed as correct or incorrect where a score of one was given for correct answer; a score of zero was given for incorrect answer practice these scores were converted into a percentage score. Accordingly, the total score ranged between zero to 8 points. The undergraduate nursing students' practice was considered adequate if the percent score is 60% or more and inadequate if less than 60%. For each part, the score of the items was summed up and the total was divided by several items, giving a mean score for the area. These scores were converted into a percent score.

#### **Validity and reliability of the tools:**

The clarity, viability, and usefulness of the tools were evaluated, and their content validity was validated by a panel of five Medical and Surgical Nursing specialists with a combined experience of more than ten years. The tool's content validity index (CVI) was 88 percent. Using alpha, the internal consistency of dependability was evaluated. Cronbach's alpha was 0.93 which revealed that the tool consisted of relatively homogenous items as indicated by high reliability.

#### **Ethical considerations:**

Official permission was obtained through an issued letter from the Dean of Faculty of Nursing, Minia University to conduct this study. The purpose of the study was explained to the undergraduate nursing students in the first part before starting the administered questionnaire the researcher informed the participants that, the study was voluntary, they were allowed to refuse to participate and they had the right to withdraw from the study at any time, without giving any reason. Moreover, they were assured that their information would be confidential and used for research purposes only.

#### **The procedure of data collection:**

##### **I-Preparatory phase:**

The researchers reviewed the current and past available literatures the available textbooks, articles, magazines, and internet searches to

develop the tools for data collection and prepare the instructional guideline.

### A pilot study

A pilot study was conducted on 10% of the undergraduate nursing students (90 undergraduate nursing students). It was excluded from the total sample. It was done to notice any ambiguity in the tools, to ensure transparency of the items, as well as, to determine the time needed for data collection. The clarity, applicability, and testing of the feasibility of the research process needed for modifications were carried out based on the results of the pilot study to develop the final form of the tools.

### II-Implementation phase:

- Official permission to conduct the study was obtained from the responsible authorities.
- On the first page of the online questionnaire, undergraduate nursing students were informed about the background and objectives of the study. The average time spent by undergraduate nursing students completing the online questionnaire was approximately 6-8 minutes.
- Online consent was obtained from undergraduate nursing students after explaining the aim of the study.
- The data collection was conducted from October 2021 to December 2021.
- The researchers used the online Google form spreadsheet to create the research. They shared a link to the participant undergraduate nursing students to collect data that included an online administered questionnaire. This link was presented in Facebook and WhatsApp groups.
- The online administered questionnaire was used For the first time, these were used as a pretest for the assessment of undergraduate nursing students' knowledge, attitudes, and practices regarding blood donation.
- The average time spent on undergraduate nursing students' completion of the online administered questionnaire was approximately 20 minutes.

Whats App groups were introduced for all the studied undergraduate nursing students to explain the study's purpose and gain their cooperation.

The researcher explained to the studied undergraduate nursing students how to fill out an online questionnaire.

The link;

[https://docs.google.com/forms/d/e/1FAIpQLScwZEacH710kZVtuYiJ1\\_E3\\_PO4CdECmpdDS6JIPZ\\_w0\\_Zw/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScwZEacH710kZVtuYiJ1_E3_PO4CdECmpdDS6JIPZ_w0_Zw/viewform?usp=sf_link) was sent to all the studied female students to identify their knowledge, attitudes, and practices towards blood donation

- Goals and expected outcome criteria were considered when planning blood donation program contents for the studied undergraduate nursing students.
- Images, movies, and PowerPoint presentations were employed by the researchers as learning tools.
- The researchers met the studied undergraduate nursing students online through Zoom meetings through voice calls, videos, and chat.
- The program contents were distributed by the researchers to the participant undergraduate nursing students in Whats App and Facebook groups after clarifying the purpose of the study. Each session took 40- 50 minutes.

### The general aim of the orientation program:

To improve undergraduate nursing student's performance regarding blood donation

### **Specific objectives of the program:**

- Define the blood donation.
- Enumerate causes of blood donation.
- Determine the contraindication of the
- List complications of blood donation
- Identify the blood group and types, different types of blood donors
- Describe the amount of blood contained in the human body
- List what are the components of blood, what is the right age for blood donate, what is the appropriate weight for the person who donates blood, amount of blood a person can donate in a single time

### **The program consisted of theoretical knowledge about:**

- Definition of blood donation.
- Indication of blood donation.
- Contraindication of blood donation.
- Advantages of blood donation.
- Precautions for blood donation
- Complications of blood donation.

### **The reported practical skill was included the following procedure:**

- Frequencies of blood donation
- Precautions before blood donation
- Precautions during blood donation

- Precautions after blood donation,
- Normal blood pressure for the donated person (mmHg),
- Laboratory investigations before donation
- Laboratory investigations after donation
- Food and medications after blood donation.

#### Evaluation phase:

After two weeks after implementing the orientation program regarding blood donation, an evaluation of the research sample was done using the same format of tools that were used in the pre-test to evaluate the effect of the orientation program.

#### Statistical analysis:

Using SPSS, the data were examined (version 20). The demographic characteristics of the participants and the information sources were analyzed, and the findings were presented as frequencies and percentages. To examine the homogeneity of demographic characteristics, the Chi-square and Two-Sample Kolmogorov-Smirnov tests were utilized. Using the U test and analysis of covariance, the knowledge and practice were compared (ANCOVA). With these presumptions in mind, an ANCOVA was performed, with pre-test scores corrected as a covariate variable, and the adjusted means of the two groups were compared. The significance level was set at P 0.05.

#### Results:

**Table (1):** Illustrates that the studied undergraduate nursing students were with a mean age of  $20.44 \pm 1.35$  years and 63% of them were females. Regarding their academic year, (31%) of the studied undergraduate nursing students were in the second level. As regards attending any blood donation educational program, (39%) of the studied undergraduate nursing students stated that they attended a blood donation educational program.

**Figure (1):** Clarified that 43% of the studied undergraduate nursing students stated that their favorite source of receiving information regarding blood donation was television followed by the internet (33%), group training was 20%, books and journals were 4%.

Table (2): Shows the frequency and percentage distribution of the studied undergraduate nursing students' knowledge regarding blood donation pre and post-orientation program. It was noticed that a highly statistically significant difference and improvement was

found between undergraduate nursing students' knowledge regarding blood donation pre and post-orientation program implementation ( $P < 0.001$ ).

**Figure (2):** Demonstrates that 40% of the studied undergraduate nursing students had satisfactory knowledge regarding blood donation pre-orientation program which improved post-orientation program and become 96% of them had satisfactory knowledge.

**Table 3** represented that 97% of the studied undergraduate nursing students post-orientation program implementation agreed with blood donation is charitable or voluntary, 89% of them agreed with blood donation is a positive behavior, 90.0% of them agreed with a willingness to donate blood for the future, and 85% of them agreed with blood donation can lead to anemia and infectious disease.

**Figure (3)** clarifies the percentage distribution of the studied undergraduate nursing students regarding their total attitude level towards blood donation pre and post-orientation program. It observed that 26% of them had a negative attitude toward blood donation pre-orientation program and decreased to become 6% post-orientation program. Additionally, 64% of them had a positive attitude toward blood donation post-orientation program compared to 94 % post- orientation program.

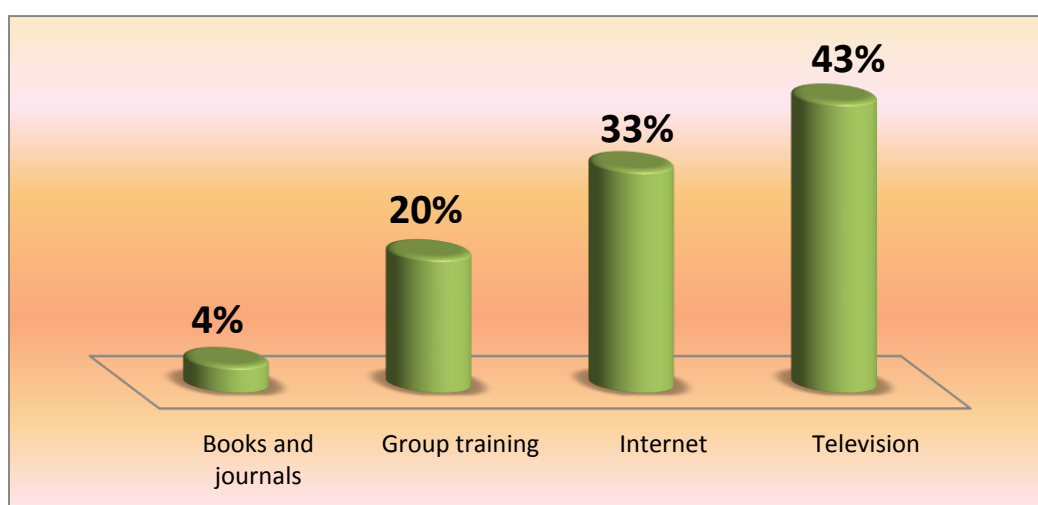
In the comparison of the studied undergraduate nursing students' reported practices regarding blood donation pre and post-orientation program, **table (4)** illustrates that there were highly statistically significant differences between undergraduate nursing students' practice in pre and post orientation program ( $p < 0.001$ ) Regarding all aspects of blood donation practices.

**Figure (4):** Portrays the undergraduate nursing students' total practices regarding blood donation pre and post-orientation program, and it was observed that 33% of the studied undergraduate nursing students had an adequate level of practice pre-orientation program, but 93% of them had an adequate level of practice post-orientation program.

**Table (5):** Correlation revealed significant positive linear correlations between knowledge-attitude ( $r = 0.443$ ,  $p < 0.001$ ), knowledge-practice ( $r = 0.226$ ,  $p < 0.001$ ), and attitude-practice ( $r = 0.227$ ,  $p < 0.001$ ). This result reflects the positive relationship between knowledge, attitude, and practice regarding blood donation.

**Table (1):** Frequency and percentage distribution of the studied undergraduate nursing students' characteristics (n=900)

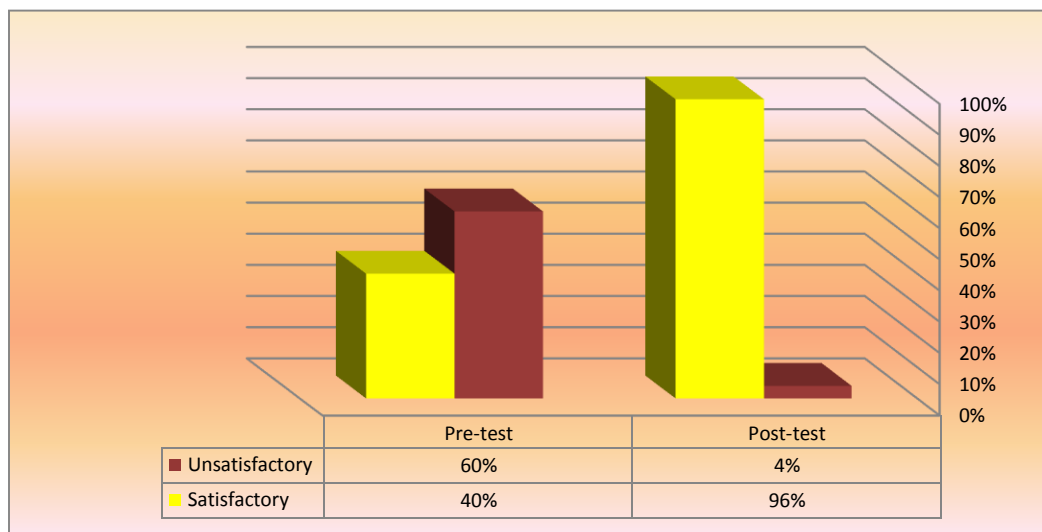
Personal characteristics	No.	%
Age / year	Mean $\pm$ Stander deviation	20.44 $\pm$ 1.35
Gender		
Female	567	63%
Male	333	37%
Academic year		
1	261	29.0
2	279	31.0
3	162	18.0
4	198	22.0
Attending any blood donation educational program		
Yes	351	39.0
No	549	61.0

**Figure (1):** Percentage distribution of the studied undergraduate nursing students regarding the favorite source of receiving information regarding blood donation (n=900)**Table (2):** Frequency and percentage distribution of the studied undergraduate nursing students' knowledge regarding blood donation pre and post-orientation program (n=900)

Undergraduate nursing students' knowledge	No = (900)			P-value
	Pre-orientation program (No/%)	Post orientation program (No/%)	$\chi^2$	
Definition of blood donation	270(30)	846(94)	126.03	<0.001*
Causes of blood donation	315 (35)	828 (92)	110.24	<0.001*
Complications of blood donation	351(39)	801 (89)	122.20	<0.001*
The amount of blood contained in the human body	207 (23)	774 (86)	130.53	<0.001*
What are the components of blood	198(22)	783 (87)	113.12	<0.001*
What is the right age for blood donating	180 (20)	801 (89)	127.56	<0.001*
Blood group and types	225(25)	846 (94)	116.47	<0.001*
Different types of blood donors	135 (15)	792 (88)	110.28	<0.001*
What is the appropriate weight for the person who donates blood	171 (19)	810 (90)	133.24	<0.001*
Amount of blood a person can donate in a single time	117 (13)	864 (96)	120.26	<0.001*

\*highly significance at 0.001 levels

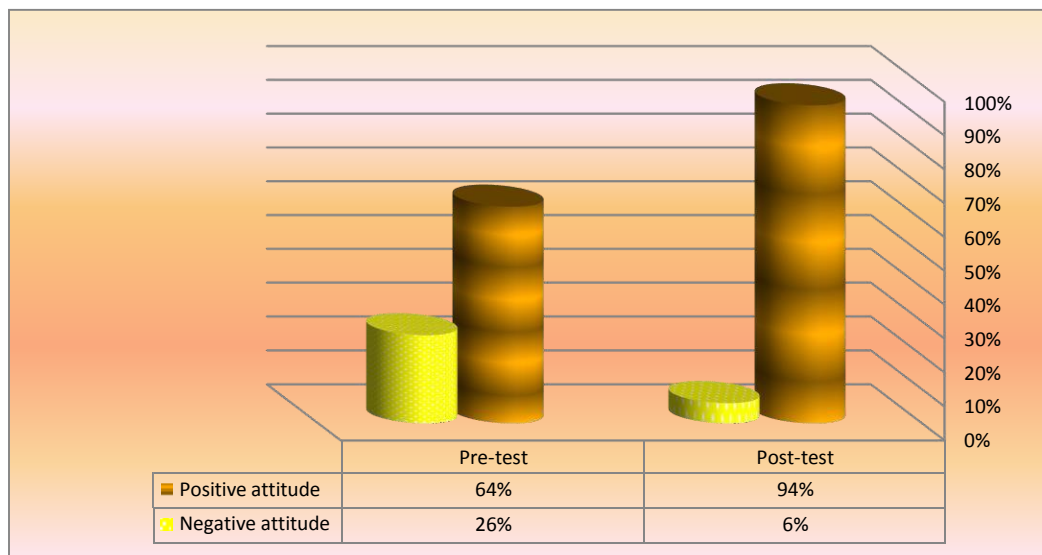
-Chi-square test



**Figure (2):** Percentage distribution of total knowledge level of the studied undergraduate nursing students regarding blood donation pre and post-orientation program (n= 900).

**Table (3):** Frequency and percentage distribution of the studied undergraduate nursing students' attitude toward blood donation post-orientation program implementation (n=900)

Undergraduate nursing students' attitude	No = (900)					
	Agree		Neutral		Disagree	
Blood donation is charitable or voluntary	873	97.0	27	3.0	0	0.0
I think blood donation is a positive behavior	801	89.0	54	6.0	45	5.0
Parents should be informed before donation of blood	522	58.0	387	43.0	81	9.0
I think blood donation can lead to anemia and infectious disease	765	85.0	243	9.0	54	6.0
Willingness to donate blood for the future	810	90.0	63	7.0	27	3.0
Willingness to donate blood to an unknown person if asked	432	48.0	306	34.0	162	18.0
Willingness to become a regular donor	405	45.0	315	35.0	180	20.0
Willingness to tell the family if donated blood	495	55.0	360	40.0	45	5.0



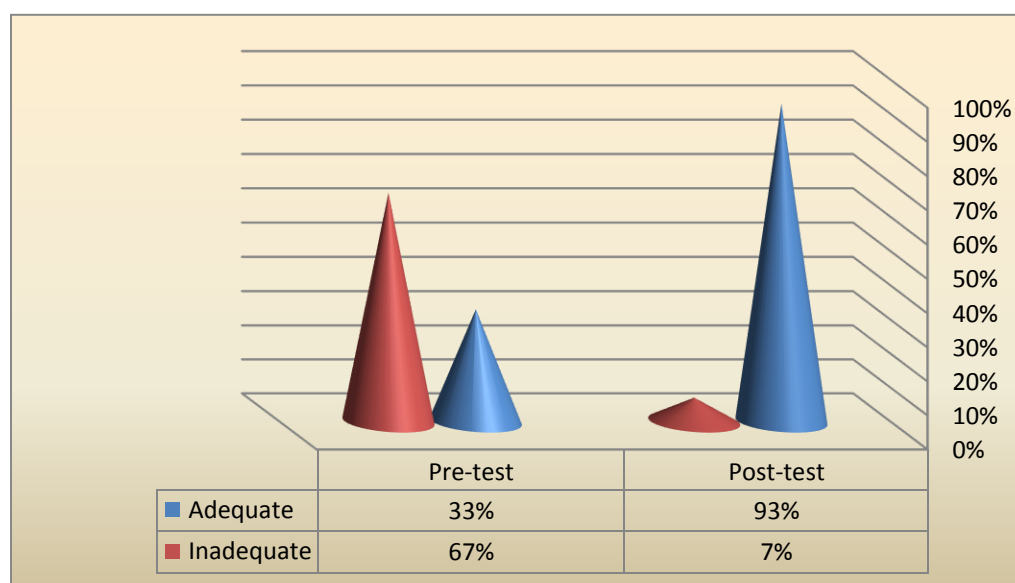
**Figure (3):** Percentage distribution of the studied undergraduate nursing students regarding their total attitude level towards blood donation pre and post-orientation program (n= 900).



**Table (4):** Comparison of studied undergraduate nursing students' reported practices regarding blood donation pre and post-orientation program (n=900)

Undergraduate nursing students' reported practices	Studied students (n=900)				X <sup>2</sup>	P-value
	Pre orientation program		Post orientation program			
	N	%	N	%		
Frequencies of blood donation	594	66.0	900	100	75.23	<0.001**
Precautions before blood donation,	270	30.0	828	92.0	63.45	<0.001**
Precautions during and after blood donation	324	36.0	846	94.0	67.78	<0.001**
Contraindication of blood donation	342	38.0	882	98.0	64.93	<0.001**
Normal blood pressure for the donated person	468	52.0	864	96.0	26.85	<0.001**
Laboratory investigations before donation	288	32.0	846	94.0	87.44	<0.001**
Laboratory investigations after donation,	360	40.0	828	92.0	36.72	<0.001**
Food and medications after blood donation.	306	34.0	882	98.0	69.35	<0.001**

\*\*; Highly significant at p-value < 0.001

**Figure (4):** Percentage distribution of the studied undergraduate nursing students regarding their total practice level in blood donation pre and post-orientation program (n= 900).**Table (5):** Correlation coefficient between total studied undergraduate nursing students' knowledge, attitude, and practices scores regarding blood donation pre-and post- orientation program.

Variable	Correlation coefficient	P-value*
Knowledge-Attitude	0.443	<0.001
Knowledge- practice	0.226	<0.001
Attitude- practice	0.227	<0.001

\*Correlation significant at <0.001levels

**Discussion:**

Blood donation is life-saving and useful in surgery, accidents, delivery cases, bleeding peptic ulcer, liver diseases, lung diseases, cancer, burn cases, and blood diseases such as hemophilia, anemia, and thalassemia but some of the patients needing transfusion do not receive timely access to safe blood. A safe blood donor is a blood donor who donates blood voluntarily, without knowing the beneficiary, without any expectation, and without being under pressure of a direct or indirect nature (**Kurian & Sarkar, 2019**). Therefore, the present study aimed to evaluate the effect of the orientation program on undergraduate nursing students' performance regarding blood donation.

Regarding the mean age of the studied undergraduate nursing students, the present study revealed that it was  $20.05 \pm 1.3$  years. From the researchers' point of view, this reflected that young age was the cause of fear of needles as the main reason that the students thought caused a low rate of donating blood.

This result was in the same line as a recent study done by **Chauhan et al., (2018)** determined the knowledge, attitude, and practices about voluntary blood donation conducted among undergraduate medical students in India showed that the mean age was  $20.42 \pm 1.38$  years. Concerning the gender of the studied nursing students, three-quarters of them were female students. This result was in the same line as a recent study done by **Cicolini et al., (2019)** who studied Nursing students' knowledge and attitudes toward blood donation: A multicentre study and investigated factors involved in the blood donation (in a population of Italian nursing students mentioned that three-quarters of participants were female nursing students.

These results are supported by the study conducted by **Raed et al., (2021)** who mentioned in their study about "Knowledge and Attitudes towards Blood Donation among Students of the Faculty of Applied Medical Sciences at King Abdulaziz University" that the mean age of the students was around 22 years.

As regards attending any blood donation orientation program, the present study indicated that more than one-third of the studied undergraduate nursing students had attended a

blood donation educational program. From the researchers' point of view, this is considered one reason from reasons of knowledge deficit that not attending blood donation educational program.

The findings of the present study Clarified that more than two-fifths of the studied undergraduate nursing students stated that their favorite source of receiving information regarding blood donation was television. These results are similar to findings conducted by **Verma et al., (2016)** who studied "Voluntary Blood Donation: Attitude and Practice among Indian Adults" and found that TV was identified as the most influential media (for encouraging people to donate blood. A similar study by **Hesamedin et al., (2018)** about " Awareness of and attitude towards blood donation in students at the Semnan University of Medical Sciences "and reported that more than half of the students preferred social media (such as telegram & text messages) as the best method of receiving information about blood donation.

Regarding the studied **undergraduate** nursing students' knowledge level, the study **results showed** that two-fifths of the studied undergraduate nursing students had satisfactory knowledge regarding the blood donation pre-orientation program. From the researchers' point of view, this reflected the studied female students' needs to be updated by emphasizing voluntary blood donation and organizing regular continuing medical education programs to bridge the knowledge gap and motivate the students regarding voluntary blood donation. And improved post- orientation program and become almost all of them had satisfactory knowledge. From the researchers' point of view, this result reflects the positive effect of orientation program implementations, which meet the undergraduate nursing students' needs and provide them with sufficient knowledge.

This result was lower than what was found by **Mulatu et al., (2017)** who assessed the knowledge, attitude, and practice of blood donation among residents of Aman Sub-City, South West Ethiopia they mentioned that more than three-quarters of total respondents had good knowledge while less than one fifth only had poor knowledge. Another recent study was done by **Melku et al., (2018)** who studied "Knowledge, attitude, and practice regarding blood donation

among graduating undergraduate health science students "and found that more than half of undergraduate health science students had inadequate knowledge. This difference related to medical colleges did not study any topics related to blood donation so they hadn't knowledge about it.

These findings are similar to **Rizwan et al., (2022)** who conducted a study about "Knowledge, attitude, and blood donation practices among medical students of Taif University" that knowledge related to blood donation was not adequate among the study population, and only one-third of the participants had shown good knowledge about it. This is similar to a study conducted in India by **Devi et al., (2018)** who studied "Knowledge, attitude and practice of blood safety and donation" and showed that only one-third of the medical students showed adequate knowledge regarding blood donation.

These results are generally in line with the findings of other studies conducted in Iran by **Hashemi et al. (2019)** who studied only more than ten percent of the participants had a good level of awareness of blood donation. It proposed that the low percentage of people with good awareness of blood donation in the current study might be due to inadequate educational programs.

Regarding the studied undergraduate nursing students' knowledge level, the study results showed that a highly statistically significant difference and improvement was found between undergraduate nursing students' knowledge regarding blood donation pre and post-one-month orientation program implementation. This improvement emphasizes the fact that most undergraduate nursing students have a strong desire to learn more knowledge about blood donation and show the effect of the program.

Concerning the studied undergraduate nursing students' attitude, the findings of the current study revealed that the majority of them agreed with blood donation can lead to anemia and infectious disease. These results are matched with the study conducted by **Raed et al., (2021)** who mentioned in their study about "Knowledge and Attitudes towards Blood Donation among Students of the Faculty of Applied Medical Sciences at King Abdulaziz University" that

students reported that there was a relationship between blood donations and transmitting diseases.

This result was in accordance with a recent study done by **Govindasamy et al., (2019)** determined knowledge, attitude, and practice regarding blood donation among medical students of government Thiruvannamalai Medical College in Tamil Nadu, India, found that about two-fifths of them don't donate blood because they suffered from anemia also, **Andsoy et al. (2016)** determined the relationship between the knowledge, attitude, and behaviors of the Turkish nursing students towards blood donation and their emphatic tendencies at School of Health in Karabuk University stated that near one-third of the Turkish nursing students are reluctant to donate blood due to the pain caused by the injection and the fear from the faint. But this result contradicted a recent study done by **Verma et al. (2018)** showed that the most common reason for non-donation of blood among medical students was lack of awareness regarding when and where to donate blood and the second most common reason was fear of pain and discomfort.

Similarly, **Jacobs & Berege (2019)** found in their study about "Attitudes and beliefs about blood donation among adults" in Tanzania, and areas where HIV is a common problem, people are, typically, discouraged from donating blood due to the fear of contracting the human transmitting diseases to blood donors.

Concerning the studied undergraduate nursing students' attitude, the findings of the current study revealed that almost all of them agreed with blood donation is charitable or voluntary, and the majority of them agreed with blood donation is a positive behavior, willingness to donate blood for the future. Also, this result is supported by a recent study **Melku et al., (2018)** mentioned that the majority of undergraduate health science students were encouraged others to donate blood. This result is similar to a recent study done by **Alsalmi et al. (2019)** reported that the majority of the health professions students in Saudi Arabia delivered a positive attitude regarding blood donation and **Melku et al., (2018)** mentioned that more than three-quarters of undergraduate health science students had positive attitude regarding blood donation.

These results are in line with a study in Chennai, India conducted by **Uma et al., (2019)** entitled " Knowledge, attitude and practice towards blood donation among voluntary blood donors " and revealed that most of the students responded positively to the fact that using an application to facilitate access to information about donating blood. So, students should be provided with opportunities by holding regular blood donation camps and awareness campaigns, which may help boost the motivation to voluntarily donate blood and create a positive attitude toward voluntary blood donation. Also, **Rizwan et al., (2022)** found that students must display adequate understanding and a positive attitude toward blood donation.

In addition, this finding is inconsistent with the results of other studies conducted by **Hosain et al., (2017)** about "Knowledge and attitude towards voluntary blood donation among Dhaka University students "university students in Bangladesh, the majority of the participants showed a positive attitude towards blood donation.

This result is consistent with **Kanwal et al., (2019)** who studied "Knowledge, attitude and practices of voluntary blood donation among students of Rawalpindi Medical University" and reported that the majority of students agreed that they are willing to donate blood in the future. This willingness is much higher compared to other studies done in other countries.

The results of the present study indicated that in the post-orientation program almost all of the studied undergraduate nursing students had a positive attitude towards blood donation. From the researchers' point of view, it reflected the good impact of the program on improving practices. These confirmed the significant modifications in the adult patient practice that reflected the main goals of the implementation of the orientation program. This result agreed with **Fan et al., (2020)** who reported that health behavior change when gaining the right knowledge and adopting the practice. Also, a recent study by **Rana et al., (2020)** illustrated that sufficient individual knowledge is associated with effective management of disease and promotion of a person's health. A study by **Ricardo et al., (2018)** supported that; knowledge deficit is

associated with poor health and maladaptive disease preventive behavior.

The present study results revealed that there were highly statistically significant differences between undergraduate nursing students' practice in pre and post-orientation program ( $p < 0.001$ ) regarding all aspects of blood donation practices and the majority of them had an adequate level of practice post- orientation program. From the researchers' point of view, it reflected the good impact of the orientation program on improving practices. These confirmed the significant success of the orientation program implementation.

The present study results revealed significant positive linear correlations between knowledge-attitude, knowledge-practice, and attitude-practice. This result reflects the positive relationship between knowledge, attitude, and practice regarding blood donation. From the researchers' point of view, this reflects the importance and effectiveness of an orientation program that is commonly associated with improving knowledge and a better understanding among the studied students and practices to help them learn and acquire good knowledge and apply it. This association is explained that when students had sufficient knowledge that can help them practice well which is reflected in their attitude. This result was in the same line as **Verma et al. (2018)** who presented that medical student there was a statistical significance difference between medical students' knowledge and their attitude about blood donation.

### **Conclusion:**

Based on the findings of the current study, the findings of the study concluded that orientation program had positive effects on improving undergraduate nursing students' performance regarding blood donation.

### **Recommendations:**

**Based on the findings of this study, the following recommendations are derived:**

- Organized blood donation orientation program are required to increase undergraduate nursing students' knowledge, attitudes, and practices toward blood donation.
- Raise awareness and promote voluntary blood donation among undergraduate nursing

students by holding workshops and seminars about blood donation to raise knowledge of blood donation among nursing students.

- Include a talk on blood donation in the first-year undergraduate nursing student courses.
- Replication of the current study with a larger sample of undergraduate nursing students in different settings is required for generalizing the results.

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