

## Knowledge, Attitude, and Practice of Blood Donation among Najran population Kingdom of Saudi Arabia

Khaled Abdullah Shafi Al-Toum<sup>1</sup>, Afaf Abdullah Farhan Almoqati<sup>2</sup>, Saad Makad Al-Osaimi<sup>3</sup>, MOqeid Gaied. Moqeid Alotaibi<sup>4</sup>, Abdoulmalek Abdullah ibrahim Albelahy<sup>5</sup>, Hamad Mohaimed Hamad Alotaibi<sup>6</sup>, Sami Abdullah Alotaubi<sup>7</sup>, Yousef Abdulhadi Alotaibi<sup>8</sup>, Bandar Abdullah Al Dalbahi<sup>9</sup>, Abdulaziz Abdullah Saleem Alanazi<sup>10</sup>, Abdul Salam Fahd Abdullah Al-Harbi<sup>11</sup>

### Abstract

*Aim: This study aimed to assess the knowledge, attitude, and practice of the Najran population about blood donation in Saudi Arabia. Methods: A descriptive study was carried out in Najran city to assess people's knowledge, attitude, and practice about donating blood. The study enrolled three hundred and three participants. convenience sampling was used to select participants. Data was collected by questionnaires and analyzed by SPSS. Results: There were 303 participants, the majority of whom were female, and 87.5 percent of them had intermediate knowledge regarding blood donation. The majority of participants strongly agreed that they have a good attitude regarding blood donation when asked about it. Additionally, there was no statistical correlation between the research sample's demographic characteristics such as age, social status, education nationality, and knowledge of blood donation, but there was a statistical correlation between these characteristics and their attitude toward blood donation. Conclusion Indicates that the majority of participants had intermediate knowledge levels, and a favorable attitude toward blood donation and 40% of them had experienced an episode of anemia in the past. In addition, 23% of people simply stated that they had donated in the past. Recommendations: The findings showed the critical need for efficient health education that aimed to inform individuals about blood donation and its effects. There should be more research done on a broader population using more samples.*

**Key words:** Najran, The Kingdom of Saudi Arabia, Knowledge, Attitude, Practice, Blood donation.

---

<sup>1</sup> Specialist Nursing, Sajer General Hospital, Saudi Arabia.

<sup>2</sup> Specialist nurses, Adwadmi general hospital, Saudi Arabia.

<sup>3</sup> Nursing technician, Dawadmi General Hospital, Saudi Arabia.

<sup>4</sup> Nursing technician, Dawadmi General Hospital, Saudi Arabia.

<sup>5</sup> Nursing, Aldwadmi Hospital, Saudi Arabia.

<sup>6</sup> Nursing specialist, Al Bajadia General Hospital, Saudi Arabia.

<sup>7</sup> Nurse specialist, Prince Mohammed bin Abdulaziz Hospital (Riyadh), Saudi Arabia.

<sup>8</sup> Nursing technician, Huraymila General Hospital, Saudi Arabia.

<sup>9</sup> Nursing Technician, Rafaya Aljemsh General Hospital, Saudi Arabia.

<sup>10</sup> Nursing Specialist, Prince Mohammad bin Abdulaziz Hospital, Saudi Arabia.

<sup>11</sup> Nursing Specialist, Al-Qawara General Hospital, Saudi Arabia.

## Introduction

Because blood is a key component of the human body that can only be produced naturally through human resources, blood donation has become a procedure that every healthcare establishment should consider. (Alharbi et al., 2018) Globally, and particularly in developing nations, the demand for safe and sufficient blood transfusions is rising to meet medical needs and treat clinical conditions. This is primarily because of rising rates of traffic accidents and transfusion-dependent hematological disorders like sickle cell anemia, thalassemia, and nephrotic syndrome. (Hamali, 2018) Both developed and developing countries are now finding it difficult to enroll donors to donate at regular times per year. Around 118 million units of blood are gathered from donors each year all around the world. Children under the age of five received more than 50% of blood transfusions in underdeveloped nations, whereas patients over the age of 60 accounted for up to 76% of all transfusions in wealthy nations. Blood donors can be classified as family replacement, paid, or compensated, or voluntary unpaid donors. Regular, unpaid, voluntary blood donors provide blood that is trustworthy, safe, and sufficient. (World Health Organization, 2023) Additionally, encouraging younger individuals to donate blood voluntarily as the quantity, quality, and safety of blood products have increased. (Hindawi S, 2020) Several variables affected the willingness and recruitment of individuals to give their blood willingly. Numerous studies have demonstrated a correlation between the age, sex, and educational level of the donor population and these demographics. (Alnouriet al., 2019) .

### Problem Statement

Blood donation is currently the only method to receive blood and its components. The scarcity of blood in medical institutions is a serious concern for any society. Donor attitudes, knowledge, motives, and beliefs impact the process of donating blood as well as the number of donors that are now actively involved. (Hamali, 2018)

### Rationale and Justification

The Saudi public's blood donation prevalence was below expectations, most likely as a result of misunderstandings, a lack of awareness, and a negative attitude toward donation. Educational initiatives are required to raise Saudi citizens' awareness of blood donation and to change their attitudes regarding it. (Alharbiet al., 2018).

### Aim of the study:

This study aims to assess the knowledge, attitude, and practice of the Najran population about blood donation in the Kingdom of Saudi Arabia.

### Research question:

The researcher answered the question: What is people's knowledge about blood donating? What is the people's attitude regarding blood donation? What is people's practice regarding blood donation? & What is the relationship between demographic data and public knowledge about blood donation in Najran City, Kingdom of Saudi Arabian.

## Materials and methods:

### Study design:

The study was done by using a descriptive community-based study design to assess the knowledge, attitude, and practice of the Najran City population about blood donation.

### Study area:

The study was conducted in Najran City. It is in southwestern Saudi Arabia near the border with Yemen. It is the capital of Najran Province.

**Study population:**

adults aged eighteen years older or above both genders. from the Najran City community.

**Inclusion criteria**

An adult member of the Najran community whose age is eighteen years older or above both genders and agreed to join in the study.

**Exclusion criteria**

Any member of the Najran community who age is less than eighteen years old.

**Sampling procedure and sample size**

A convenience sample method was employed to choose participants from the Najran City Community. In this study, three hundred and three members of the Najran community joined up. For convenience. The sample size was calculated using the Sample Size Calculator. Confidence Level = 95%., Acceptable error = 5%. Expected frequency = 50%.

**Data collection techniques:**

Data was gathered by distributing to the Najran City population the created questionnaire and outlining the goal of the research.

**Data collection tool:**

Data was gathered. Data was gathered using an automated questionnaire linked to social media once the study's purpose was communicated to the Najran community. The questionnaire consists of Five parts: the first portion contains demographic information. Personal data, including age, gender, qualification, and occupation, was gathered in this area. Blood donation is covered in part two. Section three concerns the history of chronic disease in order to assess the patient's clinical background; Section four concerns participants' knowledge of blood donation; and Section Five concerns attitudes toward blood donation. The participants' responses were measured using a Likert scale. Scheme grading: 70% or above is considered high, 50% to 70% is considered intermediate, and 50% is considered low.

**Data Analysis:**

Version 24 of the Statistical Package for Social Sciences (SPSS) was used to handle and analyse the data. descriptive statistics were used to show the data as frequencies, percentages correlation coefficients utilized. A threshold of 0.05 was used to evaluate statistical significance.

**Ethical consideration:**

Participants' rights were respected throughout the investigation since they were made aware that their participation in the study was voluntary that the results would only be used for research reasons, and that they could withdraw their consent at any time before completing the online survey.

Tool reliability was evaluated using the Cronbach-Alpha Coefficient statistical test, which produced a reliability score of ( $r=0.77$ ).

**Pilot research:**

To test the tools' applicability, clarity, and feasibility, a pilot study involving 10% of the study sample was performed. The final form had been established when all of the modifications were completed. The study group did not include the person from the pilot research.

**Results summary:**

303 people in total voluntarily took part in the study. According to Table 1: the participants were mostly between the ages of 18 and 28 years (54.5%), were mostly Saudi (75.6%), had more than half female genders, and had only received a university degree in 49.8% of cases. Less than half of the participants (43.2%) were single, and 26.4% of the participants were employed.

Items		F	%
Participation	Yes	303	100%
	No	0	0
Age	18 to 28 years	165	54.5%
	29 to 39 years	86	28.4%
	39> years	52	17.2%
Height	140-150	50	16.5%
	155-165	161	53.1%
	>165	92	30.4%
Nationality	Saudi	229	75.6%
	Non-Saudi	74	24.4%
Sex	Male	98	32%
	Female	205	67.7%
Educational level	read and write	19	6.3%
	Intermediate education	41	13.5%
	high school education	92	30.4%
	University education	151	49.8%
Social status	Married	124	40.9%
	Single	131	43.2%
	Widower	37	12.2%
	Divorced	11	3.6%
Job	Work	80	26.4%
	do not work	108	35.6%
	Student	115	38.0%

Table 2 illustrates that 23% of participants gave blood.

Items		F	%
Blood donation	Yes	70	23.1
	No	233	76.9%

Table 3: reveals that 23% of the participants have a history of chronic illnesses. 40% of individuals have a history of anemia.

Items	Yes	No	Total
Previous history of any chronic diseases	23%	77%	100%
History of anemia	40%	60%	100%

Table 4: demonstrate people's knowledge of donating blood with a total mean and standard deviation ( $1.9 \pm 0.8$ ).

	Items	Mean	Std. Deviation
1	1-Do you think that donating blood is healthy?	2.40	0.78
2	2-Does donating blood cause infection?	1.91	0.80
3	3- Can a pregnant woman donate blood?	1.61	0.78
4	4-Can a person with chronic diseases donate blood?	1.58	0.76
5	5- Is it possible for a menstruating woman to donate blood?	1.66	0.74
6	6- Is there a certain age for donating blood?	2.07	0.86
7	7- Can a breastfeeding woman donate blood?	1.79	0.77
8	8- When people need a blood transfusion, do they have to pay?	1.50	0.75
9	10- Is blood from one donor sufficient for one needy person?	1.81	0.77
10	11-Does donating blood make you lose or gain weight?	1.62	0.73
11	12-Can people under 16 years of age donate blood?	1.66	0.77
12	13-Does donating blood help patients who need it?	2.36	0.84
13	14-Can people of any blood type donate blood?	2.32	0.83
14	15- If the donor develops a fever on the day of donation, can he donate blood?	1.59	0.77
15	16-Do you think community awareness helps with blood donation opportunities?	2.32	0.84
16	17-Can a smoker donate blood?	1.83	0.82
Total knowledge		1.9	0.8

Figure 1: demonstrates that the majority of participants (87.5%) had intermediate knowledge regarding blood donation, followed by (11.2%) who had high knowledge.

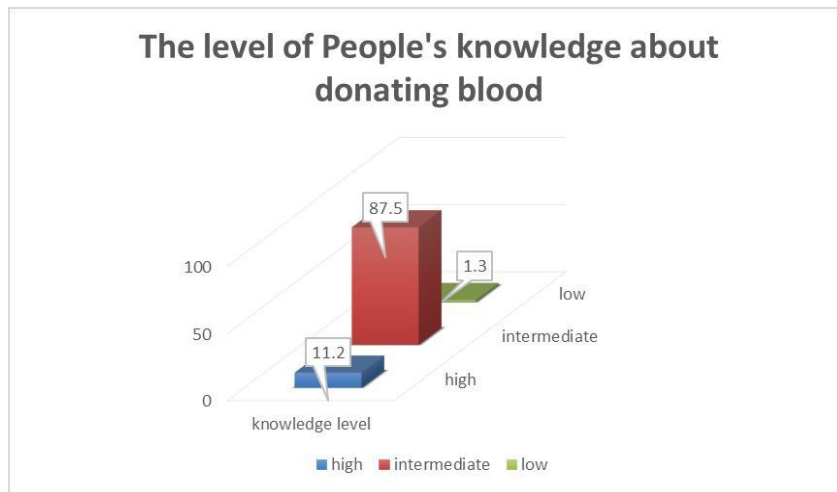


Figure 2: demonstrates that the majority of participants (72.6%) had a positive attitude toward donating blood, whereas 27.40% had a negative attitude about it.

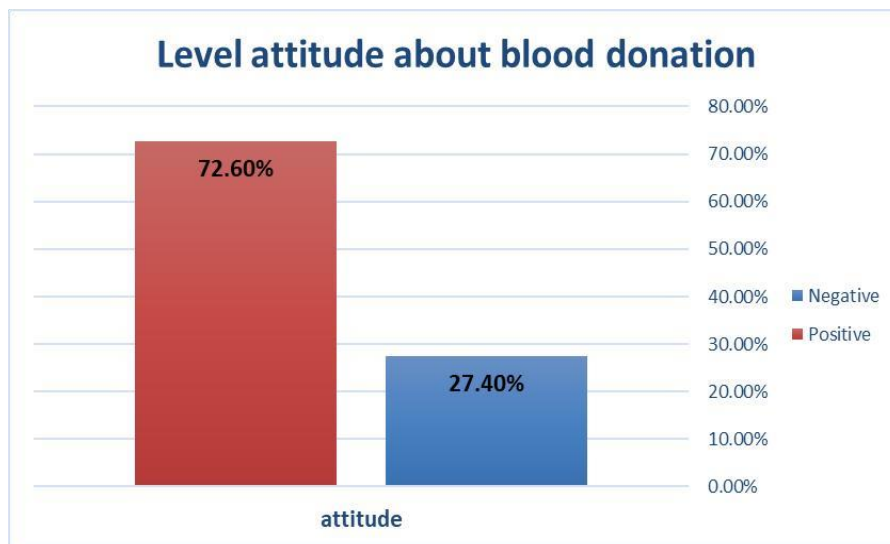


Table 5: showed that the participants provided attitude about blood donation with a mean total and standard deviation (3.6 ± 1.3).

NO	Attitude	Mean	Std. Deviation
1	My donation will encourage others to donate.	4.03	0.98
2	I will donate blood if it is confirmed that the donated blood will be delivered to one of my family members in the future.	3.35	1.44
3	I will donate blood if there are incentives or rewards.	3.06	1.41
4	Donating blood saves lives.	3.96	1.27
5	Donating blood is an ethical activity.	3.69	1.33
6	Young people should donate frequently.	3.57	1.29

7	People who have greater knowledge of donating blood donate more often.	3.80	1.23
8	The best way to donate blood is to volunteer without payment.	3.85	1.23
9	Do you agree to pay money to the donor?	2.99	1.43
10	Donating blood is important.	3.96	1.21
Total		3.6	1.3

Table 6: demonstrates that there was no statistically significant connection. between the research sample's demographic characteristics such as age, height, nationality, sex, and social class, and the participants' knowledge of blood donation.

Demographical characteristics		Level of knowledge						P-Value
		I don't know		I know somewhat		I know perfectly		
		F	%	F	%	F	%	
Age	18 to 20 years	21	61.8	141	53.2	3	75	0.75
	29 to 39 years	8	23.5	77	29.1	1	25	
	39 > years	5	14.7	47	17.7	0	0	
height	140-150	9	26.5	39	14.7	2	50	0.13
	155-165	18	52.9	142	53.6	1	25	
	>165	7	20.6	84	31.7	1	25	
Nationality	Saudi	25	73.5	201	75.8	3	75	0.96
	Non-Saudi	9	26.5	64	24.2	1	25	
Sex	Male	11	32.4	17.7	92.9	28	75.7	0.95
	Female	23	67.6	86	32.5	1	24.3	
Educational level	read and write	2	5.9	17	6.4	0	0	0.94
	Intermediate education	4	11.8	37	14	0	0	
	high school education	12	35.3	79	29.8	1	25	
	University education	16	47.1	132	49.8	3	75	
Social status	Married	13	38.2	109	41.1	2	50	0.93
	Single	16	47.1	113	42.6	2	50	
	Widower	3	8.8	34	12.8	0	0	
	Divorced	2	5.9	9	3.4	0	0	
Job	Work	6	17.6	74	27.9	0	0	0.31
	Don't work	12	35.3	95	38.5	1	25	
	Student	16	47.1	96	36.2	3	75	

According to Table 7, there was a statistical relationship between the age, social status, educational attainment, nationality of the research sample, and attitude level toward blood donation. However, there was no statistical relationship between the demographic characteristics and the attitude level toward blood donation for the following variables: height, sex, and job.

Demographical characteristics		Level of attitude										P-Value
		I don't quite know		I don't know		I know somewhat		I know		I know perfectly		
		F	%	F	%	F	%	F	%	F	%	
Age	18 to 20 years	0	0	11	26.2	84	57.5	55	57.3	15	83.3	0.00
	29 to 39 years	0	0	20	47.6	36	24.7	27	28.1	3	16.7	
	39 > years	1	100	11	26.2	26	17.8	14	14.6	0	0	
height	140-150	0	0	7	16.7	25	17.1	15	15.6	3	16.7	0.79
	155-165	1	100	18	42.9	83	56.8	50	52.1	9	50	
	>165	0	0	17	40.5	38	26	31	32.3	6	33.3	
Nationality	Saudi	0	0	23	54.8	114	78.1	75	78.1	17	94.4	0.00
	Non-Saudi	1	100	19	45.2	32	21.9	21	21.9	1	5.6	
Sex	Male	0	0	16	38.1	43	29.5	33	34.4	6	33.3	0.76
	Female	1	100	26	61.9	103	70.5	63	65.6	12	66.7	
Educational level	read and write	0	0	4	9.5	13	8.9	2	2.1	0	0	0.00
	Intermediate education	0	0	13	31	20	13.7	8	8.3	0	0	
	high school education	0	0	11	26.2	50	34.2	29	30.2	2	11.1	
	University education	1	100	14	33.3	63	43.2	57	59.4	16	88.9	
Social status	Married	1	100	18	42.9	61	41.8	40	41.7	4	22.2	0.01
	Single	0	0	10	23.8	59	40.4	48	50	14	77.8	
	Widower	0	0	11	26.2	19	13	7	7.3	0	0	
	Divorced	0	0	3	7.1	7	4.8	1	1	0	0	
Job	Work	1	100	13	31	33	22.6	29	30.2	4	22.2	0.16
	Don't work	0	0	19	45.2	50	34.2	35	36.5	4	22.2	
	Student	0	0	10	23.8	63	43.2	32	33.3	10	55.6	

**Discussion:**

A person's life can be saved by a blood transfusion in a variety of acute and chronic diseases. if they have blood loss as a result of an accident, surgery, or other medical issues



(Thurn et al., 2019) This study's goal is to assess the knowledge, attitude, and practice of the Najran population about blood donation. The results of the current study were consistent with those of a study conducted by Kanani in India, which revealed that the majority of participants (80.2%) had never donated blood. (Kanani AN, 2018) In contrast, research conducted in Ethiopia by Aschale revealed that the majority of respondents (83.7%) had a history of blood donation. (Aschale et al., 2021)

In terms of the participants' medical histories, 23% of the participants have a history of chronic diseases. Among the participants, anemia has a (40%) history. Most participants do not donate blood because of this. The survey found that most participants had moderate levels of understanding about blood donation. This outcome is consistent with research conducted by Melku in Ethiopia, which found that most participants (79.2%) had a sufficient understanding of blood donation (Melku et al., no date). Additionally, a different study conducted in Saudi Arabia by Alsalmi revealed that the majority of participants had enough awareness about blood donation. (Alsalmi et al., 2019) On the other hand, research by Baseer found that the majority of participants knew little to nothing about blood donation. (Baseer et al., 2017) Also study done by Tan, found that most participants had a lack of awareness about blood donation. (T, Hafizuddin and Rosnah, 2019)

The present study found that most participants had favorable beliefs toward blood donation. This outcome was consistent with a study performed by Alharbi, which found that nearly all the participants had a favorable attitude toward blood donation. (Alharbi et al., 2018) A survey executed by Melku also revealed that almost all the participants (79.2%) had positive beliefs toward blood donation. (Melku et al., no date) on the contrary, Baseer's study found that the majority of participants had negative attitudes concerning blood donation. (Baseer et al., 2017)<sup>1</sup> Alsalmi's study additionally discovered that a larger proportion of individuals had a negative attitude toward blood donation. (Alsalmi et al., 2019)

Our study discovered that there was no statistically significant relationship between the demographic characteristics of the research sample such as age, height, nationality, sex, social status, educational attainment, job, and the people's knowledge of blood donation. This outcome is consistent with research by Enawgaw and Malako in Ethiopia in terms of age and marital status. (Enawgaw, Yalew and Shiferaw, 2019) (Malako, Yoseph and Bekele, 2019). In contrast, a study carried out in India by Razdan identified a statistical relationship between participant demographics, including age, educational attainment, and socioeconomic position, and their understanding of blood donation. (Razdan et al., 2018) The current study revealed a statistical relationship between the age, social status, educational attainment, and nationality of the research sample and the attitude level toward blood donation; however, there was no statistical relationship between the attitude level toward blood donation and the relationship between height, sex, or employment. Similarly, a study conducted in Ethiopia by Enawgaw revealed a statistical relationship between the demographic characteristics of the research sample and the attitude level toward blood donation. (Enawgaw, Yalew and Shiferaw, 2019) On the other hand, a study by Gill found a statistical relationship between sex and attitude toward blood donation. (Gill, 2021)

## **Conclusion:**

The study concluded that the majority of individuals in the study had never given blood, according to the findings. While the majority of respondents had a good attitude and just a moderate amount of understanding regarding blood donation. The demographic traits of persons, such as age, height, nationality, sex, social position, degree of education, and employment, did not statistically correlate with their knowledge of blood donation. Furthermore, a statistical association was observed between the demographic attributes of the research sample, including age, social status, educational attainment, and the attitude level toward blood donation.

## Recommendations:

The findings demonstrated the urgent need for effective health education that focused on educating people about blood donation and its consequences. More research should be done with a larger sample size, across the nation, and with different methods of study.

## References:

- ALHARBI, S. ALATEEQ ,F., AHMED ,I ., ALSOGAIR A., AL-RASHDI Y, ALDUGIEMAN, T.& Ahmed,H.G. 2018.Assessment of Levels of Awareness Towards Blood Donation in Saudi Arabia J. AIMS Public Health .;5(May), pp. 324–337. doi: 10.3934/publichealth.2018.3.324.
- ALNOURI ,A.K., MAGHRABI, L.A., HAMDI, S.S., EL-GHANY, S.M.A., &ALNOURI, K.A. 2019. Analysis of the Most Common Causes of Blood Donor Deferral in Northern Jeddah : a single-center study. *Journal of Blood Medicine*. pp. 47–51
- ALSALMI, M., ALMALKI, H., ALGHAMDI, A. &ALJASIR, B. 2019. Knowledge, Attitude and Practice of Blood Donation among Health Professions Students in Saudi Arabia ; A cross-sectional study. *Journal. Family Medicine and Primary Care*. 7. pp. 2322–2327.doi: 10.4103/jfmpc.jfmpc
- BASEER, S., EJAZ, S., NOORI, M. & FAISAL A. 2017 .‘Knowledge , Attitude , Perceptions of University Students towards Blood Donation : An Assessment of Motivation and Barriers. *Isra Med J*. 9(6): 406-10.
- Enawgaw, B., Yalew, A. & Shiferaw E. 2019. Blood Donors knowledge and Attitude towards Blood Donation at North Gondar districtBloodBank , Northwest Ethiopia : a cross - sectional study *BMC Research Notes*. pp. 1–6. doi: 10.1186/s13104-019- 4776-0.
- Gill ,N.P. 2021.The Statistical Analysis of Factors Explaining the Intention of Public for Blood Donation in Jamshoro, Sindh . *Journal of Business and Social Review in Emerging Economies*.;7(2), pp. 231–238.
- Hamali, H. 2018. knowledge , Attitude Awareness , and Motivation of Blood Donation Among Academic Staff in Health Colleges in The Southern Region of Saudi Arabia . *Journal of Health Sciences*;3(2):1–7.
- ASCHALE, A., FUFA, D., KEKEBA, T& BIRHANU ,Z. 2021. Intention to voluntary blood donation among private higher education students , Jimma town , Oromia , Ethiopia : Application of the theory of planned behaviour. pp. 1–14. doi: 10.1371/journal.pone.0247040.
- Kanani, A. A. 2018 Study on Knowledge and Awareness about Blood Donation amongst Government Medical, Para- Medical and Nursing Undergraduate Students in Jamnagar, Gujarat . *Global Journal of Transfusion Medicine AATM* 3(1),pp. 46–51
- Assessment of knowledge , attitude and practice and associated factors of blood donation among health care workers in Ethiopia : a cross-sectional study. *BMC Hematology*. 19:10 pp. 1–8
- HINDAWI ,S. 2020. Evolution of Blood Transfusion Medicine in Saudi Arabia. *TRANSFUSION*;60(S1):S2–S3.doi: 10.1111/trf.15681
- MELKU, M., ASRIE, F., SHIFERAW, E., WOLDU, B., ASMELASH, D. & ENAWGAW,B. 2018. Knowledge , Attitude and Practice Regarding Blood Donation among Graduating Undergraduate Health Science Students at the University of Gondar , Northwest Ethiopia. *Ethiop J Health Sci*.28(5):571
- RAZDAN, N., KUMAR, R., BHARDWAJ, A. & SINGH, P. 2018.The knowledge , attitude , and practice toward blood donation among voluntary and replacement blood donors in Ambala , India. *International Journal of Medical Science*
- ALHARBI, S. ALATEEQ ,F., AHMED ,I ., ALSOGAIR A., AL-RASHDI Y, ALDUGIEMAN, T.& Ahmed,H.G. 2018.Assessment of Levels of Awareness Towards Blood Donation in Saudi Arabia J. AIMS Public Health .;5(May), pp. 324–337. doi: 10.3934/publichealth.2018.3.324.
- ALNOURI ,A.K., MAGHRABI, L.A., HAMDI, S.S., EL-GHANY, S.M.A., &ALNOURI, K.A. 2019. Analysis of the Most Common Causes of Blood Donor Deferral in Northern Jeddah : a single-center study. *Journal of Blood Medicine*. pp. 47–51.
- ALSALMI, M., ALMALKI, H., ALGHAMDI, A. &ALJASIR, B. 2019. Knowledge , Attitude and Practice of Blood Donation among Health Professions Students in Saudi Arabia ; A cross-sectional study. *Journal. Family Medicine and Primary Care*. 7. pp. 2322– 2327.doi: 10.4103/jfmpc.jfmpc.

- BASEER, S., EJAZ, S., NOORI, M. & FAISAL A. 2017 .‘Knowledge , Attitude , Perceptions of University Students towards Blood Donation : An Assessment of Motivation and Barriers. *Isra Med J.* 9(6): 406-10.
- Enawgaw, B., Yalew, A. & Shiferaw E. 2019. Blood Donors knowledge and Attitude towards Blood Donation at North Gondar district Blood Bank , Northwest Ethiopia : a cross - sectional study *BMC Research Notes.* pp. 1–6.
- Gill ,N.P. 2021.The Statistical Analysis of Factors Explaining the Intention of Public for Blood Donation in Jamshoro, Sindh *Journal of Business and Social Review in Emerging Economies.*;7(2), pp. 231–238.
- Hamali, H. 2018. knowledge , Attitude , Awareness , and Motivation of Blood Donation Among Academic Staff in Health Colleges in The Southern Region of Saudi Arabia . *Journal of Health Sciences*;3(2):1–7.
- ASCHALE, A., FUFU, D., KEKEBA, T & BIRHANU ,Z. 2021. Intention to voluntary blood donation among private higher education students , Jimma town , Oromia , Ethiopia : Application of the theory of planned behaviour. pp. 1–14. doi: 10.1371/journal.pone.0247040.
- Kanani, A. A. 2018 Study on Knowledge and Awareness about Blood Donation amongst Government Medical, Para- Medical and Nursing Undergraduate Students in Jamnagar, Gujarat . *Global Journal of Transfusion Medicine AATM.* 3(1),pp.46–51. doi: 10.4103/GJTM.GJTM.
- Malako, D., Yoseph ,F. & Bekele, M.L. 2019. Assessment of knowledge , attitude and practice and associated factors of blood donation among health care workers in Ethiopia : a cross-sectional study. *BMC Hematology.* 19:10 pp. 1–8.
- HINDAWI ,S. 2020. Evolution of Blood Transfusion Medicine in Saudi Arabia *TRANSFUSION*;60(S1):S2–S3. doi: 10.1111/trf.15681.
- MELKU, M., ASRIE, F., SHIFERAW, E., WOLDU, B., ASMELASH, D. & ENAWGAW, B. 2018. Knowledge , Attitude and Practice Regarding Blood Donation among Graduating Undergraduate Health Science Students at the University of Gondar , Northwest Ethiopia. *Ethiop J Health Sci.*28(5):571
- RAZDAN, N., KUMAR, R., BHARDWAJ, A. & SINGH, P. 2018. The knowledge , attitude , and practice toward blood donation among voluntary and replacement blood safety and availability. In <https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability>