

Knowledge about Hepatitis C Virus Infection among Haemodialysis Patients

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ABSTRACT

Background: Iraq has a 7.1% prevalence of Hepatitis C Virus (HCV) among its population. The transmission of HCV within haemodialysis (HD) units has been linked to higher infection rates among patients, leading to poorer survival outcomes. **Objective:** Assess the level of knowledge about the Hepatitis C Virus (HCV) among patients undergoing haemodialysis treatment. **Methods:** A descriptive (cross-sectional) study was conducted in Al-Hussein Teaching Hospital from January 14th, 2024, to March 20th, 2024, by interview method. A Non-Probability (Purposeful Sample) of (100) patients who attended the haemodialysis department for treatment and follow-up. **Results:** The study results revealed that the majority of the sample population (67%) was male, with 46% falling within the age range of 46-60 years old. Furthermore, 44% of the participants had only primary education. Notably, 52% of the respondents demonstrated knowledge about Hepatitis, with a physician being the primary source of this knowledge. The analysis showed that 62% of the participants had a moderate level of knowledge about Hepatitis C, while 30% had a poor knowledge level, and 8% had a good knowledge level. **Conclusion:** The majority of research participants have a moderate level of knowledge about hepatitis C. It was found that individuals who had prior knowledge about Hepatitis C tended to have more comprehensive knowledge compared to those who did not. These findings highlight the need for targeted educational interventions to improve public awareness and knowledge about Hepatitis C, particularly among older adults with limited education.

Keywords: Haemodialysis; Hepatitis C Virus; Infection; Knowledge

INTRODUCTION

Chronic viral hepatitis is a major global public health challenge. Individuals with chronic Hepatitis C Virus (HCV) infection have a 15–30% risk of developing cirrhosis within 20 years (Ayed & Ahmed, 2025). There is also a cumulative risk of developing liver cancer, with rates reaching 21.6% in men and 8.7% in women aged 40–74 years. According to data from the WHO, approximately 58 million people globally are living with chronic hepatitis C infection, which causes around 400,000 deaths annually. In 2019, only 21% of the 58 million people with chronic hepatitis C were diagnosed, and just 13% received treatment (Stasi *et al.*, 2024; Kenfack-Momo *et al.*, 2024).

Iraq had an overall HCV prevalence of 7.1% among its population. Recent data, however, shows that the Kurdistan region of Iraq has a slightly lower prevalence rate of 5.7%. Notably, specific groups within Iraq face higher risks of HCV transmission, including thalassaemia patients, with 13.5% testing positive for HCV, and haemodialysis patients, showing a prevalence rate of 7.1%. These findings, notably, underscore the significant role of blood transfusions in the spread of HCV within Iraq (Kamaz, 2019).

The transmission of HCV within the haemodialysis unit increases the infection rate among patients, even in developed countries where blood transfusion safety is high. Nosocomial transmission persists even after the elimination of HCV transmission through blood transfusions (Nuryati, Setiawan & Wijayanti 2025). The primary cause of nosocomial transmission is inadequate infection control procedures for blood-borne pathogens, which include maintaining a clear separation between clean and contaminated areas in haemodialysis

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units, properly handling and storing medications and blood specimens, and thoroughly cleaning and disinfecting non-disposable items. It is also important to avoid sharing supplies, instruments, or medications to prevent the transmission of HCV (Hayes *et al.*, 2022; Fabrizi, Cerutti & Messa, 2021).

Approximately 1.5 million new cases of HCV infection occur each year, and 58 million individuals worldwide are infected with the virus regularly (Parsons, 2022). Hepatitis C Virus (HCV) infection is a serious problem in haemodialysis units due to the high-risk nature of the therapy, which requires regular blood-to-blood contact. In Iraq, Hepatitis C Virus infection (HCV) is considered to be one of the primary causes of chronic liver disease, which can lead to potentially fatal outcomes. HCV infection was found to be the reason for 25% of Hepatocellular carcinoma HCC cases in Iraq. The basic measures that nurses take when caring for patients with HCV will be influenced by their knowledge of the virus. Professional nurses significantly influence reducing HCV transmission and providing sufficient care and treatment to infected patients by utilising their knowledge and skills. Low awareness of HCV makes nurses an appropriate, cost-effective destination for patients needing advice or assistance (Alzubaidi & Al-attar, 2023).

Nurses play an important role in teaching patients about Hepatitis C since they are frequently the primary healthcare practitioners who have direct, ongoing contact with them. Haemodialysis patients are more prone to getting and spreading HCV due to variables such as shared dialysis equipment, frequent bloodstream exposure, and potentially insufficient infection control methods. Understanding the virus, its transmission, preventative measures, and the relevance of therapy is critical for lowering the risk of HCV transmission in dialysis units (Abubakeer *et al.*, 2025). As a result, improving patient comprehension of HCV is a critical element of nursing care since it may have a significant influence on patient outcomes, infection control, and quality of life. Furthermore, knowing HCV can help patients make more educated decisions about their care, improve compliance with infection control methods, and promote early detection and treatment, all of which might contribute to minimising the disease's effects (Malick-Petschulat & Ketel, 2024; Richmond, Hassall & Wallace, 2024).

Enhanced monitoring is necessary because prolonged recipients of haemodialysis require early identification and treatment for HCV infections. According to the most recent research, the mean incidence of HCV infection in patients receiving ongoing dialysis treatment in the US is 5%, while the entire population has a 1% proportion (Cartwright & Patel, 2024). Multiple research studies indicate that some groups of people are prone to contracting the HIV virus, and it is advised that they be tested for the virus. Persons receiving prolonged haemodialysis treatment IV or inhalation users of drugs, transplant recipients, former convicts, and those with a history of contracting HIV ought to all be included in this group. For those who are at risk, such as those who have been punctured by injections or other blunt objects that may be infected, screening for HCV infection is also advised (Alkhalifah *et al.*, 2023).

In a study to determine the level of knowledge and information sources about hepatitis C infection among Egyptians infected with the virus, half of the participants thought that sex isn't the only way that HCV contamination is spread, and 79 (39.9%) were unaware that a mother can transmit HCV to her child during labour. Few contributors thought the HCV vaccination was accessible (Sultan *et al.*, 2018). According to a different study conducted in Saudi Arabia, 53.7% of participants knew very little about HCV infection (Alzahrani *et al.*, 2023). Because they are often called to provide treatment to HD patients, healthcare workers are in a special circumstance. As part of the medical staff, nurses guide the other people on the medical team in using disease prevention strategies to shield the individual in need. Clinicians can help patients rehabilitate while reducing infection-related problems by applying their healthcare abilities and expertise (Ahmed *et al.*, 2024).

In order to disseminate the evidence globally, a number of evidence-based guidelines have been produced for the prevention of viral hepatitis transmission in all HD settings. Nonetheless, there is a sharp rise in the prevalence of HCV in HD patients. This may be because nurses and patients are not well-versed in the prevention and spread of viral hepatitis infections (Saleh *et al.*, 2023). Furthermore, there is a dearth of data on how frequently hospitals have implemented evidence-based procedures to prevent viral hepatitis infection in HD patients; this necessitates examining the degree of awareness among all stakeholders, including the patients themselves, regarding the dialysis treatment plan (Shehata, Elsayi & Hashem, 2016).

Significance of the study: According to the review of literature, this study is the first one in Iraq specifically

examining the knowledge and awareness of Hepatitis C Virus among patients undergoing haemodialysis, highlighting an important public health gap. The majority of the studies restricted the discussion of the prevalence rates, such as the study conducted in the dialysis unit at Adiwanayah Teaching Hospital, Adiwanayah Province, mid-Euphrates region of Iraq, for exploring the prevalence rates of both HBV and HCV in patients and haemodialysis (Al-Muramdy, 2020). Another study was carried out at the haemodialysis unit in Baghdad Teaching Hospital to estimate the frequency rate and the possible associated factors responsible for hepatitis C viral infection among chronic haemodialysis patients (Amber, AL-Kaseer & Al-Diwan, 2021). Furthermore, a study was done at Habib bin Mazher Centre for Haemodialysis in Imam Hussein Medical City, Karbala, Iraq, to investigate the prevalence, anti-HCV risk factors, and surface antigen of the hepatitis B virus (HBsAg) among Haemodialysis patients (Naif *et al.*, 2023). The level of the patient's knowledge about HCV, its risk factors, and its treatments influences HCV's prevalence and impact (Swem *et al.*, 2025).

METHODOLOGY

Study Design and Sample: A descriptive (cross-sectional) study was conducted at Al-Hussein Teaching Hospital from January 14th, 2024, to March 20th, 2024. A nonprobability (purposeful) sample of 100 patients, males and females was chosen for the study. Methods of the procedure: Following the acquisition of written authorisations, the selected patient's information was gathered using carefully developed questionnaires.

Inclusion and Exclusion Criteria

Inclusion Criteria

The inclusion criteria for the study are as follows: Participants must be above the age of puberty and have been undergoing haemodialysis for at least three months. Additionally, they must be willing to take part in the study and provide informed consent. Finally, participants should be able to understand and communicate in the language of the questionnaire.

Exclusion Criteria

The exclusion criteria for the study include patients with cognitive impairment or acute mental illness that may impede communication, as well as critically ill patients who are unable to complete the interview. Additionally, patients who refuse to participate or withdraw their consent at any time will be excluded. Healthcare professionals, such as nurses or doctors undergoing dialysis, who have been previously diagnosed, will also be excluded from the study.

Instruments for data collection: To assess the knowledge regarding the Hepatitis C Virus, the researcher developed a questionnaire for administering interviews, which consisted of two parts:

Part I: Socio-demographic characteristics of patients: This part is concerned with the collection of basic socio-demographic data obtained from the patients from interview questionnaire sheets, such as age, gender, education level, marital status, Occupation, Income, Knowledge about Hepatitis, and source of information (Al-Khattabi, 2024).

Part II: Patients' knowledge regarding the hepatitis C virus—The second part of the questionnaire consists of 19 items (Alaridah *et al.*, 2024).

Rating and Scoring: The patients' knowledge levels were classified based on the percentage of their correct answers to the items of the knowledge form, where the correct answer is given a score of 1, the wrong answer is given a score of 0, and the percentage of correct answers is calculated according to the following equation:

$$\text{Percentage of correct answers} = (\text{Number of Correct Answers} \div \text{Total Number of Answers}) \times 100$$

Based on this ratio, three levels of Knowledge are defined as follows:

- Good level of knowledge (percentage of correct answers $\geq 75\%$)
- Medium knowledge level (rates of correct answers 50% to $<75\%$)
- Poor level of knowledge (percentages of correct answers $<50\%$)

Validity of the Instruments: An instrument's validity is based on its capacity to collect information; the early-developed questionnaire's validity was assessed by an evaluation team of specialists who looked at the questionnaire's sufficiency, relevance, and coherence in measuring the subjects of relevance. A draft version of the questionnaire is created and given to nine specialists with over five years of experience in the field. Additionally, modifications were made, and expert views were taken into account, along with the suggestions made by the experts.

Reliability of the Instruments: Reliability testing was conducted on a sample of 10 patients to assess the internal consistency of the questionnaire using the reliability coefficient. The scale demonstrated an acceptable level of internal consistency, with a Cronbach's alpha value of 0.73, which exceeds the commonly accepted threshold of 0.70. This indicates that the questionnaire is reliable for measuring the intended variables.

Statistical Data Analysis: The descriptive statistical data analysis approaches [Frequency (N), Percentage (%), Mean (M), and Standard deviation (SD)] and inferential statistics (*t*-test, ANOVA) are used to analyse the data of the study under investigation of the statistical package (SPSS ver.25).

Ethical Consideration

The researchers explained the purpose and benefits of the study to the participants, and verbal consent was obtained from all of them. Ethical clearance was granted by the University of Warith Al-Anbiyaa, College of Nursing, with reference number 71, on 3rd January 2024. Additionally, formal approvals were obtained from the Karbala Health Directorate and the Development and Training Centre, Iraq with approval number 739, on 14th April 2024 to conduct hospital visits. An anonymous questionnaire was used to ensure complete confidentiality.

RESULTS

Table 1: Distribution of the Sample According to their Demographic Characteristics

Variables		n = 100	
		<i>f</i>	%
Gender	Male	67	67.0
	Female	33	33.0
Total		100	100
Age (year)	Less than 30	7	7.0
	30 – 45	33	33.0
	46 – 60	46	46.0
	More than 60	14	14.0
Total		100	100
Level of Education	Illiterate	14	14.0
	Read and Write	8	8.0
	Primary	44	44.0
	Preparatory	5	5.0
	Secondary	18	18.0
	Diploma	7	7.0
Total	Bachelor	4	4.0
		100	100
Occupation	Unemployed	14	14.0
	Employed	21	21.0
	Self Employed	7	7.0
	Worker	22	22.0
	Other	36	36.0
Total		100	100
Material Status	Married	12	12.0
	Widowed	81	81.0
	Separated	4	4.0
	Divorced	3	3.0
Total		100	100

Income	Insufficient	2	2.0
	Hardly Enough	31	31.0
	Sufficient	27	27.0
	More Than Adequate	40	40.0
Total		100	100
Have Knowledge About Hepatitis	Yes	52	52.0
	No	48	48.0
Total		100	100
Source of Your Information	Physician	46	46
	Nurse	31	31
	Family	9	9
	Internet	14	14
Total		100	100

Table 1 shows that approximately two-thirds of the patients in the sample (67%) were male. Less than half of them (46%) were 46 to 60 years old. The data on education shows that 44% of the patients had primary education. In terms of occupation, more than one-third of them were in the category (other); 22% were workers. The majority of the patients (81%) were widowed. About 40% of them had an income more than adequate. More than half of the patients (52%) knew about Hepatitis. The primary source of their knowledge about Hepatitis was physicians, accounting for 46% of the patients. See Figures 1 and 2.

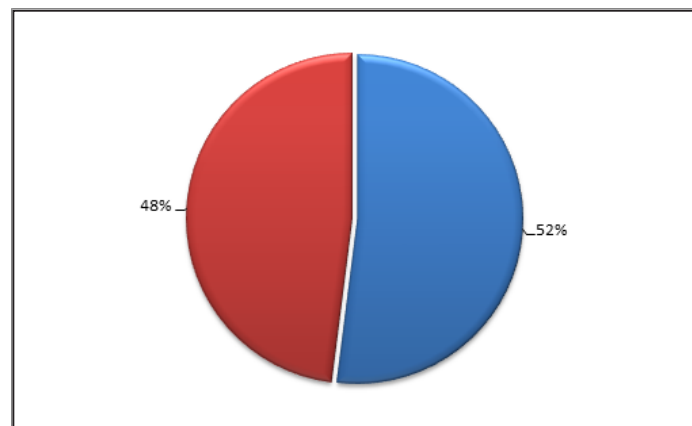


Figure 1: Distribution of Patients According to Knowledge

Figure 1 illustrates the distribution of patients based on their level of knowledge about hepatitis. The chart shows that 52% of the patients demonstrated adequate knowledge, while 48% had inadequate knowledge.

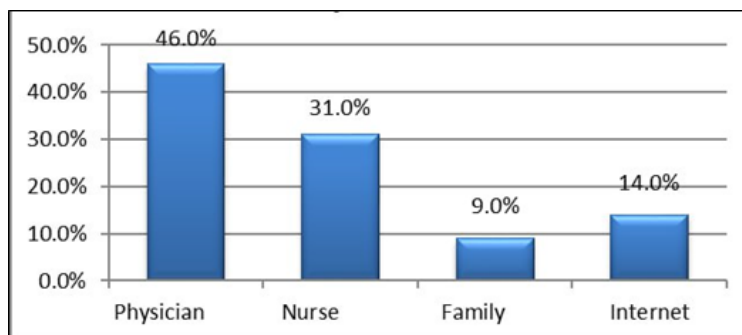


Figure 2: Distribution of Patients According to their Source of Information

Figure 2 shows that the highest source of knowledge for patients was the physician, approximately 46%.

Table 2: Distribution of Participants Based on Their Responses Related to the Hepatitis C Virus

Items		Correct (%)	Incorrect (%)
1	Does a person infected with hepatitis C remain infected with the disease throughout his life?	40	60
2	Can HCV be transmitted through blood transfusion from an infected donor?	94	6
3	Does long-term infection with HCV lead to liver damage or cancer?	60	40
4	Can HCV be transmitted through a handshake with someone carrying the virus?	11	89
5	Is it possible to contract the infection by using the toothbrush of someone who is infected with HCV?	74	26
6	Is there a vaccine for HCV, in your view?	55	45
7	Can proper disposal of sharp waste prevent HCV transmission?	78	22
8	Should patients with HCV consume a diet rich in high-protein foods for better health?	27	73
9	Are individuals who use drugs by injecting themselves at a higher risk of getting HCV infections?	45	55
10	Is there medication to cure HCV?	88	12
11	Can a person be re-infected with hepatitis C after recovering from a previous infection?	79	21
12	Is jaundice one of the prevalent symptoms of HCV?	71	29
13	Can screening donated blood for hepatitis C prevent transmission of the virus?	85	15
14	Can public toilets transmit HCV?	38	62
15	Does smoking increase the severity of HCV and hinder its treatment?	53	47
16	Do hepatitis C medications help people with the virus live longer?	66	34
17	Can HCV be treated in less than two weeks?	12	88
18	Should people with hepatitis C take medication even if they have no symptoms?	20	80
19	Does drinking alcohol of all types and quantities increase the severity of contracting HCV?	55	45

The table 2 revealed that the majority of the patients had a correct answer (yes) about "Can HCV be transmitted through blood transfusion from an infected donor?" by 94%, Followed by 88%, who had the correct answer (yes) about "Is there medication to cure HCV?" On the other hand, the table shows that the highest percentage of incorrect answers was about "Can HCV be transmitted through a handshake with someone carrying the virus?" by 89%, then "Can HCV be treated in less than two weeks?" by 88%, and "should people with hepatitis C take medication even if they have no symptoms?" by 80%.

Table 3: Distribution of the Sample According to their Knowledge Levels Regarding the Hepatitis C Virus

Total Knowledge Level	F	M	SD	%	Ass.
Poor	30	10.5	2.857	55.3	Moderate
Moderate	62				
High	8				
Total	100				

F: Frequency; %: Percentage; M: Mean for the total score; SD: Standard Deviation for the total score; Ass: Assessment

Table 3 illustrates the distribution of the sample according to their knowledge levels regarding the Hepatitis C Virus. It indicates that the highest percentage of the patients in the sample (62%) considered their knowledge level to be moderate, 8% considered their knowledge level to be high, and 30% considered their knowledge level to be Poor. Furthermore, the average correct knowledge score was 10.5 ± 2.857 at the moderate level. Figure 3 shows the distribution of the sample according to their levels of knowledge about hepatitis C.

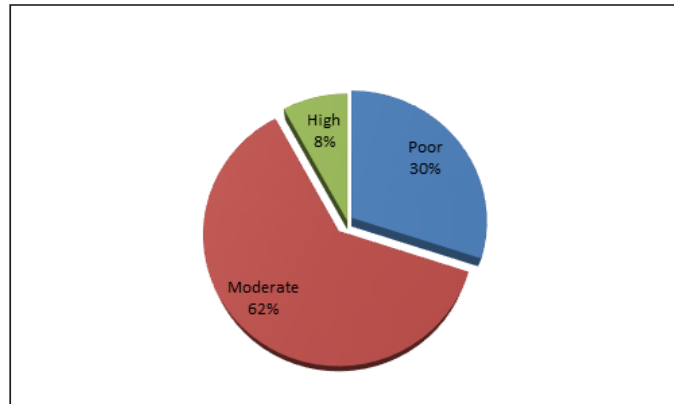


Figure 3: Distribution of the Sample According to the Levels of Knowledge about Hepatitis C

Figure 3 shows the overall patients' levels of knowledge about hepatitis C, which were within a moderate level (62%).

Table 4: Relationship between the Knowledge Score of the Sample Regarding Hepatitis C Virus and their Demographic Data

Variables	N	M	SD	T/F	<i>p</i> -value
Gender					
Male	67	10.45	3.05	0.309 (T)	0.758
Female	33	10.64	2.46		
Age (years)					
< 30	7	10.71	1.50	1.742 (F)	0.163
30–45	33	11.39	2.92		
46–60	46	10.02	2.72		
> 60	14	9.93	3.39		
Level of Education					
Illiterate	14	8.71	2.61	1.914 (F)	0.087
Read & Write	8	10.50	1.41		
Primary	44	11.23	2.83		
Secondary	18	10.44	3.29		
Preparatory	5	8.60	3.78		
Diploma	7	11.14	1.95		
Bachelor	4	10.50	1.73		
Occupation					
Unemployed	14	10.71	2.64	0.698 (F)	0.595
Employed	21	9.95	3.29		
Self-Employed	7	12.00	2.83		
Worker	22	10.59	2.39		
Others	36	10.42	2.41		

Marital Status					
Married	12	10.67	1.37	0.997 (F)	0.398
Widowed	81	10.63	3.04		
Separated	4	9.50	1.73		
Divorced	3	8.00	2.65		
Income					
Insufficient	2	9.50	2.12	0.408 (F)	0.748
Hardly Enough	31	10.94	2.79		
Sufficient	27	10.22	2.79		
More than Enough	40	10.43	3.04		
Have Knowledge About Hepatitis					
Yes	52	11.38	2.54	3.344 (T)	0.001**
No	48	9.75	3.06		
Source of Information					
Physician	36	11.22	2.60	3.117 (F)	0.030*
Nurse	41	10.49	2.96		
Family	16	10.94	2.79		
Internet	7	9.86	0.82		

T: t-test for Independent sample, F: One Way Anova test, *: p-value ≤ 0.05 , **: p-value ≤ 0.01

Table 4 shows that there were significant differences in patients' knowledge about hepatitis C regarding the presence of previous knowledge they had about this disease ($P = 0.001$) in favour of "Yes" and the source of information ($P = 0.030$) in favour of the physician. The table also shows no significant statistical differences ($p \geq 0.05$) in the Patients' Knowledge of hepatitis C, according to the rest of the demographic variables.

DISCUSSION

Individuals receiving maintenance haemodialysis (MHD) for End-Stage Renal Disease (ESRD) are more susceptible to contracting HCV infection. The frequency of HCV infection varies widely by region of the world, ranging from less than 5% to almost 60%. It is reliably linked to the length of MHD and the number of transfusions. The prevalence of HCV has decreased in many dialysis facilities since routine screening was implemented, and greater focus has been paid to halting its spread.

In this study, the highest percentage of participants were male (67%) and aged between 46 and 60 years (46%). The majority of participants (44%) had a primary education level, and 22% were employed. Most participants (81%) were widowed, and their monthly income was considered more than adequate. Additionally, 52% of participants had prior knowledge about hepatitis, with the largest group (36%) obtaining their information from a physician. Furthermore, 94% of participants were aware that hepatitis could be transmitted through blood from an infected person. These findings align with the results of a study by Alotaibi *et al.* (2021), which found that 81% of Saudi Arabian residents knew that blood transfusions from an infected patient could transmit hepatitis C, emphasizing the importance of blood testing before transfusion.

The findings also agreed with the results of a study conducted by Zhao *et al.* (2021), which evaluated the knowledge, attitude, and psychological status of patients living with hepatitis C in five provinces in China. Their results showed that 93.6% of participants correctly recognised that hepatitis C could be transmitted through transfusion of contaminated blood products. Regarding attitudes, only 53.8% were willing to shake hands with or hug people infected with HCV, while 29.5% were uncertain and 16.7% expressed unwillingness. Additionally, the present findings were in line with a British study by Yazdani *et al.* (2022), which assessed knowledge of hepatitis C and awareness of reinfection risks among people who completed direct-acting antiviral therapy. It showed that only 17% of participants incorrectly answered a question about whether

hepatitis C could be transmitted by shaking hands with an infected person. These studies indicate that there are no contradicting findings, likely due to the widespread availability of knowledge about hepatitis C through various sources, making this information accessible to everyone.

The highest percentage of participants (62%) have a moderate level of knowledge about hepatitis C. This finding could be attributed to patients having previous knowledge about hepatitis C. These findings were agreed with by another conducted by Sultan *et al.* (2018) that assessed the level of knowledge and available sources of information about hepatitis C infection among HCV-infected Egyptians, which indicated that the highest percentage of participants had a moderate level of knowledge about hepatitis C. On the contrary, these findings were inconsistent with the study results of Yazdani *et al.* (2022), which indicated that the majority of participants had a high level of knowledge about the Hepatitis C Virus. Also, not consistent with the results of the study by Zhao *et al.* (2021), which showed that the highest percentage of participants had a low level of knowledge about the Hepatitis C Virus. On the other hand, the findings are inconsistent with the results of Barnhart and others, which indicated that the majority of participants have a high level of knowledge about the Hepatitis C Virus (Barnhart *et al.*, 2021).

The research findings indicate that differences in participants' knowledge levels about hepatitis C are influenced by their prior awareness of the disease. This highlights both the patients' interest in enhancing their understanding of hepatitis C and the effectiveness of the information sources they accessed. The study revealed that a majority of participants had some prior knowledge of the disease. Additionally, the findings show that the level of knowledge varied depending on the source of information. Physicians were identified as the most preferred and effective source. This trend may be attributed to the fact that physicians and nurses, as key members of the healthcare team, spend considerable time interacting with patients while providing care and services.

These findings are not in line with the results of the study by Barnhart *et al.* (2021), which reflect that there were no significant statistical differences in the level of participants' knowledge due to the variable source of information about the Hepatitis C Virus. Finally, the research findings disclose the importance of information about the level of knowledge among patients about the Hepatitis C Virus in Haemodialysis Units. That knowledge is related to a dangerous infectious disease, so the data resulting from the current study would be a basic basis on which to design educational programmes and write courses that keep pace with modern science and contribute to ensuring patient prevention in the future.

Limitation

The article focuses only on dialysis patients, which means the results may not be generalisable to other high-risk groups or the general population. Additionally, the article's title may oversimplify the complex issue of hepatitis C among dialysis patients by framing it solely as a matter of "knowledge", ignoring systemic issues such as access to education, communication with healthcare providers, or institutional protocols.

CONCLUSION

In conclusion, many haemodialysis patients have limited or inadequate knowledge regarding Hepatitis C, its spread, routes, and consequences. This knowledge gap is challenging, considering that those undergoing haemodialysis are more likely to get HCV due to frequent blood contact and the possibility of cross-contamination during the course of care. The study recommended doing further studies in the future focusing on the significance of enhancing patient education on HCV. Learning programs for haemodialysis patients should focus on raising knowledge about the dangers, preventative measures, and currently available treatments for HCV, as recommended in the future scope of this study. Those activities might include providing information about pathways of transmission (such as blood-to-blood contact), the importance of frequent testing, and the advantages of early treatment. Healthcare providers play an extremely important role in teaching patients about HCV. Nurses, nephrologists, and other healthcare professionals should be proactive in sharing knowledge, demonstrating the necessity of infection control methods, and ensuring that patients understand their particular risk factors. Targeted education and enhanced communication from healthcare providers are crucial for reducing the knowledge gap and improving patient outcomes.

Conflict of Interest

All authors confirm that they don't have competing interests.

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