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Clinicoepidemiological study of Human Immunodeficiency Virus infected patients in Kirkuk city

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Abstract

Background: HIV remains a significant global public health issue, causing 40.4 million deaths and ongoing transmission worldwide, with increasing new infections in previously declining countries.

Aim of the study: The main goal of this research is retrospective analysis of epidemiological and clinical characteristics of HIV infected patients, who were diagnosed and treated at the Clinic for Infectious Diseases in Kirkuk city in the period from 2003 until the end of 2023

Patients and methods: This retrospective study was conducted for HIV and AIDS in Kirkuk from August 20, 2023, to the end of May 2024. It included 60 HIV patients attending the consultation clinic for chest and respiratory diseases in Kirkuk City, comprising both males and females. Data were collected through structured interviews using a standardized questionnaire, which covered demographic information, infection history, beliefs about transmission, knowledge and experiences with HIV, satisfaction with healthcare services, and general attitudes towards HIV. The study examined patients' HIV infection properties, including duration and treatment status. It found that unprotected sexual intercourse was the most common cause, followed by dental operations and cupping therapy. Most patients were informed about HIV transmission, but participation in prevention programs was minimal. Patients had varying levels of awareness about HIV-related symptoms, stages, and medical check-ups. The majority of patients believed there were changes in transmission modes over time and mixed opinions on healthcare service improvements. The study also explored general population attitudes towards HIV, including knowledge of risk factors, cultural contributions, comfort discussing HIV status, and stigma reduction beliefs.

Results: The study revealed that the majority of HIV patients fell within the 28-37 year age range (38.33%), followed by the 38-47 year range (28.33%), with a mean age of 35.5 ± 9.17 years. A significant majority were male (91.67%), with females constituting 8.33% and a male-to-female ratio of 11:1. Most patients resided in urban areas (75%), and the largest occupational group was the unemployed (65%). A study found that 91.67% of patients had a history of past HIV infection, with the majority living with the infection for 1-15 years. All patients received HIV treatment, with unprotected sexual intercourse being the most common cause. 98.33% of patients were informed about HIV transmission at diagnosis, but participation in prevention programs was minimal. Most patients (83.33%) felt there was insufficient awareness about HIV transmission methods in Kirkuk City. Comfort in discussing HIV transmission history with healthcare providers varied, with 51.67% feeling slightly comfortable and 38.33% moderately comfortable. Most patients underwent regular medical check-ups and had relatively high awareness of HIV stages. The study reveals that 46.67% of patients feel moderately informed about the long-term effects of HIV, with low incidence of opportunistic infections. However, 76.67% are aware of AIDS-defining illnesses and generally rate comorbidity management positively. Most patients are satisfied with the accessibility of antiretroviral therapy (ART), but 78.33% experience side effects. Most patients believe routine testing is infrequent and public awareness campaigns are slightly effective. Most patients observe changes in transmission modes over time, and general knowledge about risk factors is slight. Comfort in discussing HIV status is low.

Keywords: Clinicoepidemiological, HIV and AIDS, Immunodeficiency, infection, sexual intercourse

1. Introduction

Human Immunodeficiency Virus (HIV) is a lentivirus, which is a type of retrovirus. It was found to be the cause of Acquired Immunodeficiency Syndrome (AIDS) [1].

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The virus was first identified in the early 1980s, when a group of strange cases of immune weakness were found in the US. HIV mostly attacks and affects CD4+ T cells, which are an important part of the immune system. The genetic material of viruses is RNA, but when they enter host cells, they reverse-transcribe it into DNA, which is then added to the genome of the host. Because of this, the virus can stay inside the host cells [2]. HIV is transferred via direct exposure to certain bodily fluids, including blood, semen, vaginal secretions, rectal secretions, and breast milk, originating from an individual who is infected. The predominant methods of transmission encompass engaging in sexual intercourse without protection, sharing needles that are infected among those who inject drugs, and transmitting from mother to kid during the process of birthing or nursing [3]. Untreated HIV infection typically results in the development of AIDS, which is marked by a significant reduction in CD4 cells and a compromised immune system. Individuals with AIDS are more prone to opportunistic infections and certain malignancies, rendering them vulnerable to ailments that would normally be regulated by a robust immune system [4].

The Human Immunodeficiency Virus (HIV) continues to be a major global public health concern, resulting in the loss of 40.4 million lives to date and continued transmission globally. This includes a rise in new infections in certain nations that were previously seeing a decrease. By the end of 2022, over 39.0 million people were living with HIV, with 25.6 million of them residing in the African Region as defined by the World Health Organization (WHO). In 2022, the number of individuals who died from reasons due to HIV was 630,000, while 1.3 million people became infected with the virus. The objective for 2025 is to ensure that 95% of all individuals living with HIV (PLHIV) are diagnosed, 95% of those diagnosed are receiving life-saving antiretroviral therapy (ART), and 95% of PLHIV on treatment attain a suppressed viral load for their well-being and to minimize the spread of HIV to others. In 2022, the percentages were 86%, 89%, and 93% in that order. Among the whole population of individuals living with HIV, 86% were aware of their HIV status, 76% were undergoing antiretroviral treatment, and 71% had successfully achieved suppressed viral levels [5].

Since the identification of the initial case of HIV in the 1980s, Iraq has been classified as a nation with a low prevalence of HIV in the general population (<0.1%) and a low level of HIV/AIDS pandemic. In 2014, the World Health Organization (WHO) and the Ministry of Health (MOH) in Iraq announced that our country will achieve freedom from the sickness (zero instances) after new HIV cases were found in 2012. However, over time, it became evident that numerous new HIV cases were being detected, which did not align with the collaborative efforts of the MOH and WHO [6]. From 1986 to 2005, there were a total of 247 instances reported. Additionally, from 1987 to 2005, the number of cases increased to 448 [7]. The difference between the numbers 539 and 2010 is 8. A total of 892 cases of infection were documented during the years 1986 and 2019 [9]. No incidences of infection were detected in the studies done on blood donors at the National Blood Bank in Baghdad from 2008 to 2009 [10].

The use of antiretroviral treatment (ART) has significantly decreased the occurrence of opportunistic infections (OI) among individuals who are HIV-positive and have received ART. Nevertheless, there are millions of people living with HIV in economically disadvantaged regions worldwide who

lack access to ART [11]. Currently, major preventive medications for opportunistic infections (OIs) are mostly determined by the absolute CD4+ count. This count has been proven to be a highly accurate indicator of the immediate risk of acquiring acquired immunodeficiency syndrome (AIDS) in individuals with HIV infection [12]. The prevalence of particular opportunistic infections might range throughout nations and even between various regions of the same country. Identifying such a pathogen is crucial for effectively managing HIV and AIDS cases [13].

2. Patients and methods

2.1. Patients

The study included 60 HIV patients who attended consultation clinic for chest and respiratory diseases in Kirkuk city of both sexes.

2.2. Methods

2.2.1. Data collection

The collection of data was conducted by means of structured interviews employing a standardized questionnaire. The survey encompassed categories pertaining to demographic data, infection chronicles, perceptions about transmission, HIV-related knowledge and encounters, contentment with healthcare provisions, and overall attitudes towards HIV.

2.2.2. Infection Properties

- The study evaluated the infection characteristics of the patients, such as the length of illness and their treatment status.
- **Prior Infection:** The medical records of all patients included their documented history of previous HIV infection.
- **Infection Duration:** The infection duration was classified as either less than 1 year or 1-15 years.
- **Therapy Status:** The study documented whether individuals had undergone HIV therapy.

2.2.3. Patients' Beliefs about HIV Transmission

Patients were queried on their views pertaining to the etiology of their HIV infection. The investigation revealed several suspected causes, such as unprotected sexual intercourse, dental procedures, cupping treatment, blood transfusion, tattoos, unknown factors, needle sharing, dialysis, healthcare professionals, and surgical procedures.

2.2.4. Knowledge and Experiences Regarding HIV

The study evaluated patients' HIV-related information and experiences, including examining their awareness, engagement in preventive initiatives, and comfort level in addressing HIV with healthcare practitioners. The study documented patients' knowledge of the method of transmission, their involvement in preventative initiatives, and their impression of public awareness efforts.

2.2.5. HIV-Related Symptoms and Medical Care

The study recorded the patients' encounters with symptoms associated to HIV, their understanding of the different phases of HIV, the regularity of their medical examinations, and their awareness of the long-term consequences. Patients provided self-reports on the presence of symptoms and assessed their severity. The frequency of routine medical examinations was documented. The assessment focused on patients' perception of being sufficiently educated about the potential long-term consequences of HIV.

2.2.6. Perceptions of HIV and Healthcare Services

The study examined the patients' perspectives of changes in HIV transmission mechanisms, advances in healthcare services, and new clinical trends. The study documented the patients' perceptions on the evolution of HIV transmission methods. The study evaluated patients' perspectives on the quality of healthcare services for HIV patients and their handling of comorbidities.

2.2.7. General Population Attitudes towards HIV

The study investigated the attitudes of the general community towards HIV, encompassing their understanding of risk factors, the influence of culture on transmission, their willingness to communicate HIV status, and their ideas toward reducing stigma. An assessment was conducted to determine the degree of knowledge of HIV risk factors among the general population. The study documented perceptions on certain cultural or societal elements that contribute to the spread of HIV. Observations were made about the extent to which patients felt at ease while sharing their HIV status with friends or relatives. Beliefs on the influence of addressing stigma on the risk of HIV transmission were recorded.

2.3. Statistical Analysis

Descriptive statistics were employed to succinctly summarize the data. Categorical data were analyzed by calculating frequencies and percentages, whereas continuous variables were analyzed by calculating means and standard deviations. Tables were utilized to portray the study data in a straightforward and complete manner.

3. Results

3.1. Demographic characteristics

According to the results, the age group of 28-37 is the most common among HIV patients (23, or 38.33%), followed by 38-47 (Also 28.33%). Patients' average ages range from 35.5 to 39.17 years. With 55 males and 3 females, for a male-to-female ratio of 11:1, the gender breakdown is as follows: 91.67 percent men and 8.33 percent females. The distribution of patients between urban and rural locations shows that 75% live in cities and 25% in smaller towns. In terms of occupation, the jobless make up the biggest category, accounting for 65% of the patients. The employed account for 28.33%, the retired for 5%, and the students for 1.67%. Data showing 100% (60 people) in this category indicates that all patients have resided in Kirkuk for more than 15 years.

Table 1: Demographic characteristics of patients with HIV infection

Demographic characteristics	No.	%	
Age (Year)	18-27	6	10%
	28-37	23	38.33%
	38-47	17	28.33%
	48-57	9	15%
	>57	5	8.33%
	Total	60	100%
	Mean \pm SD	35.5 \pm 9.17	
Sex	Male	55	91.67%
	Female	5	8.33%
	male: female ratio	11:1	
Rural/urban	Rural	15	25%
	Urban	45	75%
	Total	60	100%
occupation	Employed	17	28.33%
	Retired	3	5%
	Student	1	1.67%
	Unemployed	39	65%
Duration living in Kirkuk (Year)	less than 15 years	0	0%
	More than 15 years	60	100%
	Total	60	100%

3.2. Distribution of HIV patients according to infection properties

There were no newly diagnosed cases among the patients in this group, as all of them had a history of previous HIV infection. The bulk of the infected persons (91.67%, or 55 people) have been living with the illness for

1-15 years, whereas a smaller percentage (8.33%) have been infected for less than a year. The length of infection varies. Regarding therapy, it is worth noting that all patients have received HIV treatment, indicating that this cohort has extensive coverage.

Table 2: Distribution of HIV patients according to infection properties

HIV infection properties	No.	%	
Past infection	Yes	60	100%
	No	0	0%
	Total	60	100%
Duration of infection (year)	1-15 years	55	91.67%
	Less than 1 year	5	8.33%
	Total	60	100%
Received HIV treatment	Yes	60	100%
	No	0	0%
	Total	60	100%

3.3. Patients' beliefs about the causes of HIV transmission in them

According to the research, 34 patients (56.67%) identified unprotected sexual intercourse as the most prevalent reason. Six individuals (10%) cited dental surgeries as a possible reason, while five (8.33%) cited cupping treatment. Three

people (about 5% of the total) diagnosed the condition as a result of blood transfusion, tattooing, other unknown factors, or sharing needles. Dialysis, medical professionals, and surgical procedures were less often mentioned, with only one person (1.67%) mentioning each. Table 3.3

Table 3: Patients' beliefs about the causes of HIV transmission in them

Patients believe about HIV cause of transmission	No.	%
Unprotected sex intercourse	34	56.67%
dental operation	6	10%
cupping therapy	5	8.33%
Blood transfusion	3	5%
Tattooing	3	5%
Unknown cause	3	5%
Sharing needles	3	5%
dialysis	1	1.67%
health care provider	1	1.67%
surgical operation	1	1.67%
Total	60	100%

3.4. Detailed information about patients' knowledge and experiences regarding HIV

The study demonstrated that the majority of patients (59, 98.33%) reported being informed about the mode of transmission when diagnosed with HIV, with only 1(1.67%) not being informed. Participation in HIV prevention programs or workshops was minimal, with 59 individuals (98.33%) not participating and only 1 individual (1.67%)

having participated. Regarding awareness about HIV transmission methods in Kirkuk City, 50 patients (83.33%) disagreed that there is enough awareness, while 8(13.33%) were neutral. Only 1(1.67%) agreed, and another 1 (1.67%) strongly disagreed. When discussing HIV transmission history with healthcare providers, 31 patients (51.67%) felt slightly comfortable, 23 (38.33%) fairly comfortable, 4 (6.67%) not comfortable, and 2 (3.33%) very comfortable.

Table 4: Detailed information about patients' knowledge and experiences regarding HIV

Patients information about HIV	No.	%	
Patients informed about the mode of transmission when diagnosed with HIV	No	1	1.67%
	Yes	59	98.33%
Patients participated in HIV prevention programs or workshops	No	59	98.33%
	Yes	1	1.67%
Patients believe there is enough awareness about HIV transmission methods in Kirkuk City	Agree	1	1.67%
	Disagree	50	83.33%
	Neutral	8	13.33%
	Strongly disagree	1	1.67%
How comfortable are you discussing Patients HIV transmission history with healthcare providers	Moderately comfortable	23	38.33%
	Not comfortable at all	4	6.67%
	Slightly comfortable	31	51.67%
	Very comfortable	2	3.33%
	Total	60	100%

3.5. Detailed information about patients' knowledge and experiences regarding HIV

Table 3.5. Provides detailed information about patients' knowledge and experiences regarding HIV. The majority of patients (59, 98.33%) reported being informed about the mode of transmission when diagnosed with HIV, with only 1 individual (1.67%) not being informed. Participation in HIV prevention programs or workshops was minimal, with 59 individuals (98.33%) not participating and only 1

individual (1.67%) having participated. In Kirkuk City, 50 patients (83.33%) disagreed that HIV transmission routes are well-known, whereas 8 (13.33%) were neutral. Only one (1.67%) agreed and one severely disagreed. When discussing HIV transmission history with healthcare providers, 31 patients (51.67%) felt slightly comfortable, 23 (38.33%) fairly comfortable, 4 (6.67%) not comfortable, and 2 (3.33%) very comfortable.

Table 5: Detailed information about patients' knowledge and experiences regarding HIV

Patients information about HIV	No.	%	
Patients informed about the mode of transmission when diagnosed with HIV	No	1	1.67%
	Yes	59	98.33%
Patients participated in HIV prevention programs or workshops	No	59	98.33%
	Yes	1	1.67%
Patients believe there is enough awareness about HIV transmission methods in Kirkuk City	Agree	1	1.67%
	Disagree	50	83.33%
	Neutral	8	13.33%

How comfortable are you discussing Patients HIV transmission history with healthcare providers	Strongly disagree	1	1.67%
	Moderately comfortable	23	38.33%
	Not comfortable at all	4	6.67%
	Slightly comfortable	31	51.67%
	Very comfortable	2	3.33%
Total		60	100%

3.6. Patients' experiences and knowledge about HIV infection reveals several key insights

A significant portion of patients, 38 individuals (63.33%), have not experienced any symptoms associated with HIV infection, while 22 individuals (36.67%) have. Among those who rated the severity of their symptoms, 31 individuals (51.67%) participated, with 5 (8.33%) rating their symptoms as mild, 8 (13.33%) as moderate, and 16 (26.67%) as severe.

44 (73.33%) are aware of HIV infection stages, while 15 (26.67%) are not. All HIV-positive patients receive frequent medical checkups. Responses differed on feeling fully informed about HIV's long-term effects: 21 (35%) felt somewhat aware, 28 (46.67%) somewhat knowledgeable, 8 (13.33%) quite informed, 1 (1.67%) extremely informed, and 2 (3.33%) not informed.

Table 6: Patients' experiences and knowledge about HIV infection reveals several key insights

patients' experiences and knowledge about HIV infection		No.	%
Have you experienced any symptoms associated with HIV infection	No	38	63.33%
	Yes	22	36.67%
How would you rate the severity of your symptoms		31	51.67%
	Mild	5	8.33%
	Moderate	8	13.33%
	Severe	16	26.67%
	No	15	26.67%
	Yes	44	73.33%
Are you aware of the different stages of HIV infection?			
Frequency of medical check-ups related to HIV	Regularly	60	100%
Feeling adequately informed about potential long-term effects of HIV	Somewhat	21	35%
	Moderately	28	46.67%
	Very	8	13.33%
	Extremely	1	1.67%
	Not at all	2	3.33%
Total		60	100%

3.7. Patients' experiences and perceptions related to HIV and associated conditions

The incidence of opportunistic infections since HIV diagnosis is low, with only 2 patients (3.33%) reporting such infections, while the majority, 58(96.67%), have not experienced them. Awareness of AIDS-defining illnesses is relatively high, with 4(76.67%) being informed about these conditions and their impacts on health, whereas 14(23.33%)

are not aware. In terms of managing comorbidities alongside HIV treatment, the majority of patients rate the management positively: 40(66.67%) rate it as good, 16(26.67%) as fair, and 2 patients each (3.33%) rate it as poor or very good. Regarding the perceived support for managing comorbidities and opportunistic infections in Kirkuk City, 37(61.67%) disagree that there is sufficient support, 16 (26.67%) are neutral, and only 7(11.67%) agree.

Table 7: Patients' experiences and perceptions related to HIV and associated conditions

Response		No.	%
Diagnosed with comorbidities like diabetes, hypertension	Yes	0	0%
	No	60	100%
Experienced any opportunistic infections since being diagnosed with HIV	Yes	2	3.33%
	No	58	96.67%
	Total	60	100%
Awareness of AIDS-defining illnesses and their potential impact on health	Yes	46	76.67%
	No	14	23.33%
	Total	60	100%
Rating the management of comorbidities alongside HIV treatment	Poor	2	3.33%
	Fair	16	26.67%
	Good	40	66.67%
	Very good	2	3.33%
	Total	60	100%
Belief in sufficient support for managing comorbidities and opportunistic infections in Kirkuk City	Agree	7	11.67%
	Disagree	37	61.67%
	Neutral	16	26.67%
	Total	60	100%

3.8. Patients' satisfaction and experiences with antiretroviral therapy (ART)

A large majority of patients, 51 (85%), are satisfied with the accessibility of ART, and 9(15%) are very satisfied, with no patients reporting dissatisfaction. Regarding side effects from antiretroviral medications, 47 patients (78.33%) have experienced side effects, while 13 patients (21.67%) have not. In terms of the effectiveness of their current antiretroviral treatment, 58 patients (96.67%) rate it as very

effective, with 1 patient each (1.67%) rating it as extremely effective and moderately effective. When considering the frequency of missing or skipping antiretroviral medications, the majority, 55(91.67%), rarely miss their doses, while 3(5%) never miss, and 2(3.33%) occasionally miss doses. Regarding satisfaction with the support and guidance provided by healthcare professionals, 47(78.33%) are satisfied, 10(16.67%) are neutral, and 3(5%) are very satisfied.

Table 8: Patients' satisfaction and experiences with antiretroviral therapy (ART)

response		No.	%
Satisfaction with the accessibility of antiretroviral therapy (ART) in Kirkuk City	Satisfied	51	85%
	Very satisfied	9	15%
	Not satisfied	0	0%
Experienced side effects from antiretroviral medications	Yes	47	78.33%
	No	13	21.67%
Effectiveness of current antiretroviral treatment	Extremely effective	1	1.67%
	Moderately effective	1	1.67%
	Very effective	58	96.67%
Frequency of missing or skipping antiretroviral medications	Never	3	5%
	Occasionally	2	3.33%
	Rarely	55	91.67%
Satisfaction with support and guidance provided by healthcare professionals regarding antiretroviral therapy	Neutral	10	16.67%
	Satisfied	47	78.33%
	Very satisfied	3	5%
	Total	60	100%

3.9. Insights into the awareness and perceptions of patients regarding HIV status

A significant majority of patients, 37(61.67%), became aware of their HIV status through routine testing, followed by contact tracing at 33.33. Only 1.67% became aware through symptomatic presentation or during a surgical operation (3.33%). Regarding changes in HIV testing accessibility over the study period, 68.33% reported no awareness of any changes, while 31.67% noticed changes. Most patients believe that HIV testing in Kirkuk City is

infrequent, with 95% indicating it is infrequent. Additionally, 63.33% observed no changes in public awareness campaigns about HIV during the study period, while 36.67% did notice changes. When rating the effectiveness of public awareness campaigns, 81.67% found them slightly effective, 13.33% found them moderately effective, and only 5% found them very effective. Furthermore, 96.67%, noticed changes in the age distribution over time.

Table 9: Insights into the awareness and perceptions of patients regarding HIV status

Response		No.	%
Awareness of HIV status	Contact tracing	20	33.33%
	Other, surgical operation	2	3.33%
	Routine testing	37	61.67%
	Symptomatic presentation	1	1.67%
Awareness of changes in HIV testing accessibility over the study period	No	41	68.33%
	Yes	19	31.67%
Frequency of HIV testing in Kirkuk City	Infrequently	57	95.00%
	Very infrequently	3	5.00%
Observation of changes in public awareness campaigns about HIV during the study period	No	38	63.33%
	Yes	22	36.67%
Effectiveness of public awareness campaigns in Kirkuk City	Moderately effective	8	13.33%
	Slightly effective	49	81.67%
	Very effective	3	5.00%
Noticed changes in the age distribution of HIV-infected individuals over time	No	2	33.33%
	Yes	58	96.67%

3.10. Perceptions and trends in HIV cases, transmission modes, and healthcare services

There are no noticeable differences in the geographic distribution of HIV cases over time, as all 60 respondents (100%) reported no change. However, 57(95%) believe that there have been changes in the modes of HIV transmission over time, while 3 (5%) do not perceive any changes.

Regarding healthcare services for HIV patients, 24 patients (40%) feel that services have improved, while a larger portion, 36(60%), believe that services have only slightly improved. Additionally, 5(8.33%) noted emerging trends in the clinical presentation of HIV cases, whereas the majority, 55(91.67%), did not observe any new trends.

Table 10: Perceptions and trends in HIV cases, transmission modes, and healthcare services

Response	No.	%	
Differences in geographic distribution of HIV cases over time	Yes	0	0%
	No	60	100%
Changes in the modes of HIV transmission over time	Yes	57	95%
	No	3	5%
Improvement in healthcare services for HIV patients in Kirkuk City	Improved	24	40%
	Slightly improved	36	60%
Emerging trends in the clinical presentation of HIV cases in Kirkuk City	Yes	5	8.33%
	No	55	91.67%

3.11. Perceptions and attitudes of the general population in regarding HIV risk factors

The majority of the population is slightly knowledgeable about HIV risk factors, with 53(88.33%) falling into this category, while 7 (11.67%), are moderately knowledgeable. Specific cultural or societal factors are believed to contribute to HIV transmission by 53(88.33%), whereas 7(11.67%) do not see these factors as contributing. When it comes to discussing their HIV status with friends or family, a vast majority, 57(95%), are not comfortable at all, with

only 2(3.33%) feeling moderately comfortable. Regarding the belief that addressing stigma can reduce the risk of HIV transmission, opinions are more varied. Twenty (33.33%) agree that addressing stigma can help, 10(16.67%) are neutral, 28(46.67%) disagree, and 2(3.33%) strongly disagree. This data highlights a need for improved education on HIV risk factors, cultural sensitivity in addressing HIV transmission, and strategies to reduce stigma and improve comfort levels in discussing HIV status.

Table 11: Perceptions and attitudes of the general population in regarding HIV risk factors

Response	No.	%	
Knowledge of the general population in Kirkuk City about HIV risk factors	Moderately knowledgeable	7	11.67%
	Slightly knowledgeable	53	88.33%
Specific cultural or societal factors contributing to HIV transmission in Kirkuk City	Yes	53	88.33%
	No	7	11.67%
Comfort discussing HIV status with friends or family members	Slightly comfortable	1	1.67%
	Moderately comfortable	2	3.33%
	Not comfortable at all	57	95%
Belief that addressing stigma can reduce the risk of HIV transmission in Kirkuk City	Agree	20	33.33%
	Neutral	10	16.67%
	Disagree	28	46.67%
	Strongly disagree	2	3.33%
	Total	60	100%

4. Discussion

The study revealed that the largest proportion of HIV patients, comprising 38.33% of the sample, were between the ages of 28 and 37. This was followed by those aged 38 to 47 years, accounting for 28.33% of the sample. The average age of the patients is 35.5±9.17 years. Regarding gender, the majority of individuals are male, accounting for 55 (91.67%) of the total, while females make up 5 (8.33%), resulting in a male-to-female ratio of 11:1. These findings were consistent with those of Szwarcwald *et al.* [14] research revealed that the majority of individuals diagnosed with HIV fall between the age range of 25-34, with a higher number of males affected. This finding aligns with the demographic pattern identified in the current study. This age demographic is frequently recognized as being more susceptible to HIV infection as a result of several reasons, including less participation in HIV preventive initiatives. The gender discrepancy is frequently ascribed to elevated risk-taking behaviors among males, such as participating in unprotected intercourse and having several sexual partners. Moreover, cultural conventions and prejudices might discourage males from pursuing HIV testing and treatment. The distribution of patients is such that 75% of them live in metropolitan regions, while the remaining 25% dwell in rural areas. Other studies also indicate that metropolitan regions have a higher prevalence of HIV infection, attributed to the higher population density and increased mobility of individuals. Urban dwellers may also benefit

from improved availability of HIV testing and healthcare services, perhaps resulting in increased rates of detection. The majority of patients, accounting for 65%, are jobless. Employed persons represent 28.33% of the patients, while retired folks make up 5% and students comprise 1.67%. The substantial proportion of jobless persons among HIV patients is a crucial discovery that corresponds with research suggesting that HIV might have a considerable effect on work status. According to Santos *et al.* [15], Individuals diagnosed with HIV frequently encounter occupational discrimination, physical constraints resulting from the illness, and mental health difficulties, all of which contribute to elevated rates of unemployment. These findings align with international studies on the length of time individuals are infected with HIV. For example, a study by Giguère *et al.* [16] found that a significant proportion of HIV patients have been living with the virus for over a decade, reflecting similar long-term infection trends. All individuals in this cohort have received HIV therapy, indicating a full treatment coverage of 100%. This is a favorable indication of the healthcare system's capacity to deliver essential antiretroviral medication (ART) to individuals with HIV. The extensive treatment coverage is in accordance with the World Health Organization's recommendations for 2024 [17], which emphasizes the importance of universal access to ART to improve health outcomes and reduce HIV transmission rates. Studies such

as those by Benson *et al.* [18] have also demonstrated the benefits of comprehensive HIV treatment coverage. Efficient antiretroviral therapy (ART) not only aids in controlling the amount of virus in the body, but also enhances the general well-being of individuals with HIV, lowers the chances of developing opportunistic infections, and reduces HIV-related deaths. The study's findings reveal that Kirkuk City has a comprehensive healthcare system in place for managing HIV, which is essential for effectively controlling the pandemic.

Govender *et al.* [19] also found that unprotected sex was the first mode of HIV transmission.

6 individuals (10%) attributed their HIV infection to dental procedures. The perceived risk of HIV transmission during dental operations is minimal, possibly due to concerns over the sterility of dental tools and practices. Similar misconceptions have been noted in other studies, such as by Wakayama *et al.* [20] and Yuvaraj *et al.* [21] who found that fears about medical and dental procedures contributing to HIV transmission persist in some communities.

Three patients (5%) attributed the source of their condition to blood transfusion, tattooing, unknown factors, and needle sharing. The worries over blood transfusions and needle sharing are justified, given these are acknowledged methods of HIV transmission, especially in environments with insufficient screening and sanitation procedures. As per the Centers for Disease Control and Prevention [22], sharing needles and unsafe blood transfusions remain significant risks in regions with less stringent healthcare standards.

However, participation in HIV prevention programs or workshops was minimal, with 59 individuals (98.33%) not participating and only 1 individual (1.67%) having participated. This low level of engagement in prevention programs highlights a significant gap in public health initiatives. Studies, such as those by Abrams *et al.* [23] and Burns *et al.* [24], emphasize the importance of continuous engagement in prevention programs to reinforce safe practices and reduce HIV transmission.

Regarding awareness about HIV transmission methods in Kirkuk City, 50 patients (83.33%) disagreed that there is enough awareness, while 8 (13.33%) were neutral. Only 1 (1.67%) agreed, and another 1 (1.67%) strongly disagreed. This finding aligns with the broader challenges faced in many regions where public health messaging may not effectively reach all demographics [25, 26]. According to Leider *et al.* [27], ensuring widespread and effective dissemination of HIV-related information is crucial in urban and rural settings alike. Increasing public awareness through targeted campaigns and community engagement is essential. In the current study, 31 HIV patients (51.67%) felt slightly comfortable, 23 (38.33%) felt moderately comfortable, and 4 (6.67%) were not comfortable at all. This discomfort in discussing HIV status reflects the persistent stigma surrounding the disease.

However, participation in HIV prevention programs or workshops was minimal, with 59 individuals (98.33%) not participating and only 1 individual (1.67%) having participated. This starkly contrasts with the level of initial information provided and indicates a significant gap in ongoing public health engagement [28, 29]. Studies like those by Oster *et al.* [30] highlight the importance of continuous participation in HIV prevention programs to maintain awareness and reinforce safe practices. Barriers to

participation might include stigma, lack of awareness about available programs, or insufficient access to these programs. Regarding awareness about HIV transmission methods in Kirkuk City, 50 patients (83.33%) disagreed that there is enough awareness, while 8 (13.33%) were neutral. Only 1 (1.67%) agreed, and another 1 (1.67%) strongly disagreed. This finding underscores the ongoing challenge of disseminating effective public health messaging in certain regions. According to Taggart *et al.* [31] and Godfrey-Faussett *et al.* [32] suggested that accurate and comprehensive information about HIV transmission reaches all segments of the population is essential for effective public health intervention.

In the current study, a significant portion of patients, 38 individuals (63.33%), have not experienced any symptoms associated with HIV infection, while 22 individuals (36.67%) have. This finding aligns with the understanding that HIV can remain asymptomatic for years, particularly in the early stages, known as clinical latency. During this period, the virus is active but reproduces at very low levels, and patients may not show any symptoms [33, 34]. According to the Centers for Disease Control and Prevention, many people with HIV live symptom-free for years before the virus advances to AIDS if untreated.

The human immune system promptly reacts to the infection and is capable of effectively managing the virus for a considerable duration. Individual variability also contributes, since genetics, general well-being, and lifestyle might impact the rate of viral progression. Regular medical examinations and timely identification aid in properly managing the virus, enabling individuals to closely monitor their health and promptly treat any concerns. Although not directly linked to untreated HIV, it is crucial to acknowledge that antiretroviral medication (ART) effectively inhibits the virus, therefore preserving immune function and preventing the advancement to AIDS [35].

5. Conclusions

1. The majority of HIV patients fall within the 28-37 year age range, with a mean age of 35.5 years with A significant majority of the patients are males and live in urban areas.
2. The most commonly believed cause of HIV transmission is unprotected sexual intercourse, followed by dental operations and cupping therapy. A small percentage of patients attributed their infection to blood transfusions, tattooing, unknown causes, and sharing needles.
3. Participation in HIV prevention programs is minimal and many patients feel there is insufficient awareness about HIV transmission methods.
4. A significant portion of patients have not experienced any symptoms associated with HIV infection.
5. Many patients feel moderately informed about the potential long-term effects of HIV.
6. Patients generally believe that there have been changes in the modes of HIV transmission over time.
7. There is a need for better management of comorbidities and opportunistic infections.
8. The general population in Kirkuk City is slightly knowledgeable about HIV risk factors.
9. Cultural and societal factors are believed to contribute to HIV transmission.

10. There is significant discomfort in discussing HIV status with friends or family.
11. Opinions on the impact of stigma reduction on HIV transmission are varied.

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