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RESEARCH ARTICLE **OPEN ACCESS**

HIV Awareness and Perceptions Among Citizens of the Eastern Province, Saudi Arabia: A Cross-Sectional Study (March–July 2024)

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Abstract:

Introduction: The study aimed to assess knowledge and perceptions regarding HIV/AIDS among adults in Saudi Arabia's Eastern Province, a region with a rising HIV burden and documented gaps in public awareness.

Methods: A cross-sectional study was conducted from March to July 2024 using anonymous online and paper-based questionnaires targeting residents aged 18–80 years in the Eastern Province. Convenience sampling recruited participants from community centers, public spaces, and social media platforms. The 21-item questionnaire assessed demographics and knowledge of HIV transmission, diagnosis, and treatment. Data were analyzed using descriptive statistics and Chi-square or Fisher's exact tests, with $p \leq 0.05$ considered statistically significant.

Results: A total of 984 participants were included, predominantly female (61.0%) and Saudi nationals (85.4%), with 64.7% having postsecondary education. Most recognized sexual transmission (92.7%), availability of confidential diagnostic methods (94.2%), and that HIV can be controlled with treatment (84.6%). Misconceptions persisted, with 25.7% believing HIV is transmitted through casual contact and 27.7% through sharing public restrooms, and several perceptions showed significant associations with age, gender, education, nationality, marital status, and healthcare work status.

Discussion: Findings show high overall awareness but important misconceptions that may perpetuate stigma and hinder prevention, particularly among younger, less educated, and non-healthcare groups.

Conclusion: Targeted, culturally sensitive educational interventions, with a focus on younger and less educated populations and the active involvement of healthcare professionals as key educators, are needed to strengthen HIV prevention efforts and support national public health goals.

Keywords: HIV awareness and knowledge, HIV/AIDS, Saudi Arabia, Education.

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1. INTRODUCTION

The global impact of Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) continues to pose a significant global threat to public health. According to UNAIDS, as of 2024, an estimated 40.8 million people worldwide were living with HIV. The year 2024 saw a troubling increase of 1.3 million new HIV cases. Furthermore, AIDS-related illnesses claimed approximately 630,000 lives in the same year.

Despite advances in treatment, there remains no cure for HIV, highlighting the critical importance of preventive measures, particularly health education, in controlling the spread of the virus. HIV weakens the immune system over time, making individuals more susceptible to various infections and diseases. The primary modes of HIV transmission include unprotected sexual intercourse, sharing contaminated needles or syringes, and mother-to-child transmission during childbirth or breastfeeding [1–3].

In many regions, including Saudi Arabia, the incidence of new HIV infections continues to rise, highlighting the urgent need for comprehensive and effective HIV prevention strategies. As of 2020, an estimated 12,000 individuals were living with HIV in Saudi Arabia, with a rise of 1,000 cases of HIV annually, reflecting a 132% increase compared to 2010. Recent epidemiological assessments have highlighted shifting disease patterns and the importance of targeted surveillance in the kingdom [4–7].

The Eastern Province, with its diverse population, has experienced a notable increase in HIV cases, necessitating targeted interventions to address this growing public health challenge. Research has highlighted significant gaps in knowledge and misconceptions about HIV transmission among different population groups in this region. Similar findings have been reported across Saudi Arabia, where varying levels of HIV awareness and misconceptions persist among the general population [8–10]. Factors contributing to the rise in HIV cases include changing social norms, population mobility, and limited access to accurate information about HIV transmission and prevention.

The Ministry of Health (MOH) in Saudi Arabia has implemented national policies aimed at early diagnosis, mandatory notification, and free treatment for people living with HIV. HIV testing is offered confidentially at government hospitals and health centers, and positive cases are registered anonymously through the National AIDS Program. Treatment, including antiretroviral therapy, is provided free of charge to Saudi citizens. Additionally, the country adheres to a policy of mandatory premarital screening, which includes testing for HIV and other infectious diseases, as a preventive strategy.

Studies have shown that health education interventions can significantly improve knowledge about HIV transmission, reduce risky sexual behaviors, and increase the use of preventive measures such as condom use. By raising awareness and enhancing understanding of HIV/AIDS, health education empowers individuals and communities to make informed decisions that protect themselves and others.

This study aims to assess and evaluate the level of knowledge and perceptions regarding HIV among the population of the Eastern Province in Saudi Arabia. By focusing on both healthcare and non-healthcare workers, the research seeks to identify gaps in knowledge, attitudes, and practices related to HIV awareness. Understanding the current level of HIV awareness is crucial in developing targeted interventions and educational programs tailored to the specific needs of the population. The goal is to enhance HIV awareness, promote preventive behaviors, and reduce the incidence of new HIV infections, thereby contributing to a healthier society [8–10].

2. METHODS

2.1. Study Design and Sample

A cross-sectional quantitative study was conducted from 1st March 2024 to 31 July 2024 using both online and paper-based questionnaires to assess knowledge about HIV/AIDS among citizens of the Eastern Province in Saudi Arabia. Individuals aged between 18 and 80 years who were currently residing in the Eastern Province were eligible to participate in the study. A total of 984 completed questionnaires met the eligibility criteria and were included in the final analysis.

A convenience sampling strategy was employed. Participants were recruited through community centers, public spaces (malls, clinics), and online platforms (social media). This approach allowed for broad outreach but also introduced potential selection bias due to the non-random nature of the recruitment.

Exclusion criteria for participation in the study were individuals below 18 years or above 80 years of age, and citizens unwilling to participate.

The Sex and Gender Equity in Research (SAGER) Guidelines were followed by the authors.

2.2 Questionnaire Development and Validation

The questionnaire used in this study was developed specifically for the purposes of this research, based on a review of existing literature and key concepts related to HIV/AIDS knowledge and perception. The questionnaire was designed to ensure anonymity and consisted of twenty-one questions across demographic information and knowledge-based items. To enhance clarity and face validity, the questionnaire was pre-tested on a small group of 20 individuals from the target population. Based on their feedback, minor revisions were made to improve wording and question structure. However, the tool was not formally validated using psychometric testing (*e.g.*, reliability or factor analysis), which is acknowledged as a limitation of this study.

2.3 Instruments

A quantitative approach utilizing a structured

questionnaire was deemed appropriate to assess knowledge and perceptions regarding HIV/AIDS. The questionnaire, designed to ensure anonymity, consisted of twenty-one questions. The initial section of the questionnaire aimed to gather demographic information, querying participants about their age, gender, marital status, educational level, and healthcare working status. The subsequent section focused on evaluating participants' comprehension and awareness of HIV/AIDS, encompassing inquiries regarding modes of HIV transmission, such as sexual contact, blood transfusion, and breastfeeding, as well as their understanding of diagnostic methods. This section also inquired about participants' knowledge regarding the causes of HIV infection, including the role of the human immunodeficiency virus and the relationship between HIV and AIDS. Furthermore, the section assessed participants' knowledge about how HIV is diagnosed, including the availability of testing methods, the importance of regular testing, and the significance of early diagnosis. The final aspect of this section focused on participants' awareness of HIV treatment options, with questions inquiring about their knowledge of antiretroviral therapy, its availability, and its role in managing HIV/AIDS.

2.4. Statistical Analysis

A descriptive analysis was conducted using counts and percentages for categorical variables. The relationship between demographic features and the questionnaire was assessed using either the Chi-square test or Fisher's exact test when more than 20% of cells had counts less than five. A two-sided p-value of ≤ 0.05 was considered statistically significant. Statistical analyses were performed using Statistical Package for the Social Sciences v26 (SPSS). All 984 participants provided complete responses for the demographic variables and HIV knowledge/perception items; there were no missing data for the variables presented in Tables **1–3**.

Table 1. Demographic features of respondents.

Demographic Features	*N* = 984 (%)
Age (years)	
18-35	450 (45.7)
36-50	427 (43.4)
>50	107 (10.9)
Gender	
Male	384 (39.0)
Female	600 (61.0)
Nationality	
Saudi	840 (85.4)
Non-Saudi	144 (14.6)
Marital Status	
Single	222 (22.6)
Married	718 (73.0)
Divorced/Widowed	44 (4.5)
Educational Level	
Less than Secondary Education	64 (6.5)
Secondary Education	283 (28.8)
Postsecondary Education	637 (64.7)
Works in Healthcare Settings	
Yes	205 (20.8)
No	779 (79.2)

Table 2. HIV awareness questionnaire items and response options used in the survey.

Question	No (%)	Yes (%)
Is the cause of AIDS a virus?	79 (8.0)	905 (92.0)
Is HIV hereditary?	867 (88.1)	117 (11.9)
Is HIV transmitted through sexual contact?	72 (7.3)	912 (92.7)
Is HIV transmitted through contaminated blood transfusion?	117 (11.9)	867 (88.1)
Is HIV transmitted through sharing needles?	133 (13.5)	851 (86.5)
Is HIV transmitted through touch, handshakes, and kissing?	731 (74.3)	253 (25.7)
Is HIV transmitted through sharing public restrooms?	711 (72.3)	273 (27.7)
Are HIV diagnostic methods available in government centers and hospitals with complete confidentiality?	57 (5.8)	927 (94.2)
Is HIV diagnosed by drawing a blood sample and testing it in the laboratory?	31 (3.2)	953 (96.8)

Question	No (%)	Yes (%)
There is no definitive cure for HIV, but it can be controlled with treatments	152 (15.4)	832 (84.6)
Are there preventive treatments before and after exposure to HIV?	204 (20.7)	780 (79.3)
Can an HIV-positive person live a completely normal life with regular follow-ups and consistent treatment?	112 (11.4)	872 (88.6)
Can an HIV-positive mother breastfeed her child without transmitting the virus?	373 (37.9)	611 (62.1)
Can an HIV-positive person marry a healthy partner under specific conditions set by the ministry?	402 (40.9)	582 (59.1)
Is AIDS the advanced stage of HIV?	125 (12.7)	859 (87.3)

Table 3. Analysis of relationships between demographic features and perceptions about HIV.

Question	Demographic Feature	Significant Associations (Percentage)
Is the cause of AIDS a virus?	Educational Level 0.021791	Below Secondary (12.5%), Secondary (11.0%), Post-secondary (6.3%)
	Healthcare Work Status 0.014550	Non-healthcare workers (9.1%), Healthcare workers (3.9%)
Is HIV hereditary?	Healthcare Work Status 0.022990	Non-healthcare workers (13.1%), Healthcare workers (7.3%)
Is HIV transmitted through sexual contact?	Educational Level 0.000625	Below Secondary (14.1%), Secondary (11.0%), Post-secondary (5.0%)
Is HIV transmitted through contaminated blood transfusion?	Age 0.000049	18-35 (16.9%), 36-50 (7.5%), Over 50 (8.4%)
	Marital Status 0.000058	Single (19.4%), Married (10.3%), Separated/Widowed (0.0%)
	Educational Level	Secondary (23.0%), Below Secondary (7.8%), Post-secondary (7.4%)
	Nationality 0.002436	Non-Saudis (19.4%), Saudis (10.6%)
Is HIV transmitted through sharing needles?	Age 0.012719	18-35 (16.9%), 36-50 (10.1%), Over 50 (13.1%)
	Gender 0.033902	Males (16.4%), Females (11.7%)
	Marital Status 0.016512	Single (18.9%), Married (12.3%), Separated/Widowed (6.8%)
	Educational Level 0.000006	Secondary (21.9%), Below Secondary (10.9%), Post-secondary (10.0%)
	Nationality 0.000356	Non-Saudis (22.9%), Saudis (11.9%)
	Healthcare Work Status 0.001725	Non-healthcare workers (13.7%), Healthcare workers (12.7%)
Is HIV transmitted through touch, handshakes, and kissing?	Educational Level 0.010083	Below Secondary (37.5%), Secondary (29.3%), Post-secondary (22.9%)
	Healthcare Work Status	Non-healthcare workers (28.0%), Healthcare workers (17.1%)
Is HIV transmitted through sharing public restrooms?	Gender 0.004350	Females (31.0%), Males (22.7%)
	Healthcare Work Status	Non-healthcare workers (30.0%), Healthcare workers (19.0%)
Are HIV diagnostic methods available in government centers and hospitals with complete confidentiality?	Educational Level 0.017474	Post-secondary (95.8%), Below Secondary (92.2%), Secondary (91.2%)
	Healthcare Work Status 0.020879	Healthcare workers (97.6%), Non-healthcare workers (93.3%),
Is HIV diagnosed by drawing a blood sample and testing it in the laboratory?	Marital Status 0.009288	Married (97.8%), Separated/Widowed (97.7%), Single (93.7%)
	Educational Level 0.007998	Post-secondary (98.1%), Secondary (94.2%), Below Secondary (90.4%)
	Healthcare Work Status 0.045122	Healthcare workers (99.0%), Non-healthcare workers (95.5%)
There is no definitive cure for HIV, but it can be controlled with treatments.	Educational Level 0.003417	Below Secondary (87.5%), Post-secondary (87.0%), Secondary (78.4%)
Can an HIV-positive mother breastfeed her child without transmitting the virus?	Nationality 0.019299	Saudis (39.4%), Non-Saudis (29.2%)
Can an HIV-positive person marry a healthy partner under specific conditions set by the ministry?	Healthcare Work Status 0.018503	Healthcare workers (66.3%), Non-healthcare workers (57.3%)

3. RESULTS

3.1. Demographic Features

The study comprised a sample size of 984 participants with varied demographic characteristics. The respondents were predominantly within the 18–35 years range at 450 (45.7%), accounting for nearly half of the sample. There was a slightly smaller proportion in the 36–50 age group at 427 (43.4%), while only about 11% (107) were over 50.

The majority of participants were married and had attained postsecondary education, indicating a relatively well-educated sample with stable marital status. Most were employed outside the healthcare sector, with only about one in five working in healthcare (Table **1**).

3.2. Questionnaire Contents

The study explored various perceptions about HIV/AIDS among participants. Overall, participants demonstrated a strong understanding of HIV/AIDS. Most respondents recognized that AIDS is caused by a virus and recognized sexual contact and contaminated blood transfusion as primary modes of HIV transmission. Most were also aware that HIV cannot be spread through casual contact such as touching, kissing, or using public restrooms.

Most participants believed HIV diagnostic methods are available in government centers and hospitals with complete confidentiality, and recognized that HIV is diagnosed by drawing a blood sample. A significant portion agreed that while there is no definitive cure for HIV, it can be controlled with treatments. Additionally, they believed that an HIV-positive person can live a completely normal life with regular follow-ups and consistent treatment.

The belief that an HIV-positive mother can breastfeed her child without transmitting the virus was held by 611 (62.1%), and 582 (59.1%) believed an HIV-positive person can marry a healthy partner under specific conditions set by the ministry. Lastly, 859 (87.3%) understood that AIDS is the advanced stage of HIV (Table **2**).

The study found significant associations between various perceptions about HIV/AIDS and specific demographic features. For the belief that “the cause of AIDS is a virus,” there were significant associations with educational level and healthcare work status. Regarding the belief that HIV is hereditary, healthcare workers' status was a significant factor. Educational level was associated with the belief that HIV is transmitted through sexual contact. Age, marital status, educational level, and nationality were significant in the perception that HIV is transmitted through contaminated blood transfusion. For the belief that HIV is transmitted through sharing needles, age, gender, marital status, educational level, nationality, and healthcare work status were associated factors. Educational level and healthcare work status were significantly associated with the belief that HIV is transmitted through touch, handshakes, and kissing. Gender and healthcare work status were significant in the perception that HIV is transmitted through sharing public restrooms.

The belief that HIV diagnostic methods are available in government centers and hospitals with complete confidentiality was significantly associated with educational level and healthcare work status. Marital status, educational level, and healthcare work status were significant factors for the belief that HIV is diagnosed by drawing a blood sample and testing it in the laboratory. Educational level was significantly associated with the belief that there is no definitive cure for HIV, but it can be controlled with treatments. Nationality was significant in the perception that an HIV-positive mother can breastfeed her child without transmitting the virus. The belief that an HIV-positive person can marry a healthy partner under specific conditions set by the ministry was significantly associated with healthcare work status. There was no significant association found for the question “Are there preventive treatments before and after exposure to HIV?” “Can an HIV-positive person live a completely normal life with regular follow-ups and consistent treatment?” and “Is AIDS the advanced stage of HIV?” (Table **3**).

4. DISCUSSION

The findings of this study highlight several key insights regarding the knowledge and perceptions about HIV/AIDS among the population of the Eastern Province in Saudi Arabia. This is the first study to date targeting this specific population.

Despite significant advancements in HIV treatment and prevention globally, this study highlights the persistent gaps in awareness and misconceptions prevalent in the region. The Eastern Province is of special interest as it has the third-highest number of HIV cases in Saudi Arabia, which can be attributed to the presence of undocumented migrant populations and heavy population migration. Most HIV cases in Saudi Arabia occur in non-Saudi nationals. Previous studies have also highlighted knowledge gaps among expatriate and vulnerable populations in Saudi Arabia [9–11].

While the high level of HIV awareness observed among participants is encouraging, further comprehensive studies are needed to evaluate Saudi Arabia's potential for HIV elimination. The relatively low incidence in Saudi Arabia may be attributed to the Islamic culture and its influence on the behaviors of the population, which is consistent with patterns observed in other countries with similar cultural and religious contexts. Religious and cultural perspectives have been shown to influence HIV-related attitudes and awareness in the region [12].

This study revealed a notable proportion of participants demonstrating a good understanding of the basic facts about HIV transmission and its causes. For instance, 92.0% correctly identified that AIDS is caused by a virus, and 92.7% recognized that HIV can be transmitted through sexual contact. However, misconceptions still exist, as evidenced by 25.7% believing that HIV can be transmitted through casual touch, handshakes, and kissing, and 27.7% thinking it can be transmitted through sharing public restrooms. These misconceptions about HIV could lead to unnecessary stigma and discrimination

against individuals living with HIV, perpetuating myths about whether HIV-positive individuals can lead normal lives and the possibility of marriage to HIV-positive individuals. This study did not directly assess stigma levels; further research incorporating stigma measurement is recommended to better understand these relationships [11].

Recent studies conducted across Saudi Arabia have revealed similar misconceptions and overall levels of knowledge among the general population and students, underscoring the need for region-wide education initiatives [8–10].

The study revealed significant associations between demographic features and perceptions about HIV/AIDS. Educational level, age, marital status, and healthcare work status were influential factors. For example, higher educational attainment was generally associated with better knowledge about HIV transmission and treatment. Conversely, younger participants and those with lower educational levels were more likely to hold misconceptions about HIV. HIV is more prevalent among young people aged 18–24; Saudi Arabia, with more than half of its population under 25 years of age, faces particular vulnerability to HIV spread. This demographic group requires targeted educational approaches to maximize impact on HIV knowledge, especially given their theoretical access to internet-based and updated information [13–14].

Healthcare workers displayed a higher level of knowledge about HIV/AIDS compared to non-healthcare workers. This is expected given their professional background, but it also highlights the critical role healthcare professionals play in disseminating accurate information and educating the broader community. Therefore, strengthening training programs for healthcare workers can further enhance community education efforts.

Gender differences were also evident in the study, with males and females showing varied levels of knowledge and misconceptions. For instance, females were more likely to believe that HIV could be transmitted through shared public restrooms. Conversely, males presented better overall knowledge of HIV, which is consistent with findings from other studies. Various factors, such as access to education, cultural influences, and targeted health campaigns, often contribute to this disparity in HIV knowledge between genders. It is worth noting that approximately 90% of HIV cases in Saudi Arabia occur in males. This suggests that gender-specific educational interventions might be necessary to address misconceptions and improve overall HIV awareness [13, 15].

The study found that most participants were aware of the availability of confidential HIV diagnostic methods in government centers and hospitals. This is a positive indicator of trust in the healthcare system's ability to manage HIV confidentially. However, continuous efforts are needed to encourage regular testing and early diagnosis, which are crucial for effective HIV management and prevention.

Awareness about the lack of a definitive cure for HIV, but the availability of treatments to control the virus was relatively high among participants. Nonetheless, a significant proportion of the population was unaware of preventive treatments before and after exposure to HIV. Enhancing knowledge about pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) can play a vital role in reducing new HIV infections.

The study also highlighted misconceptions regarding the potential for HIV-positive mothers to breastfeed without transmitting the virus. According to current WHO guidelines and evidence, with maternal antiretroviral therapy and appropriate infant prophylaxis, the risk of Mother-To-Child Transmission (MTCT) can be substantially reduced to <2%. Exclusive formula feeding remains a safe option, though with effective maternal and infant treatment regimens, some women may choose to breastfeed under medical supervision.

5. LIMITATIONS

This study has several limitations that must be acknowledged. Firstly, the reliance on self-reported data collected through online and paper-based questionnaires may introduce sampling bias, as those with internet access or a greater inclination towards health surveys might not accurately represent the broader population.

Additionally, the cross-sectional design captures information at a single point in time, making it difficult to infer causality or changes in knowledge and perceptions over time. The structured questionnaire, while comprehensive, may not fully capture the nuances of participants' knowledge and perceptions, which could be better explored through open-ended questions or qualitative methods. Furthermore, the study does not assess the direct impact of existing health education programs on HIV awareness, which would require longitudinal studies and intervention-based research.

Information on non-responders and reasons for non-participation was not collected, which may introduce non-response bias and limit the ability to compare participants with those who declined or did not complete the survey.

Finally, unaccounted confounding variables, such as socioeconomic status, access to healthcare, and personal experiences with HIV/AIDS, may influence the findings. Moreover, given the sensitivity of the topic, responses may have been influenced by social desirability bias, with participants potentially overstating their knowledge or providing answers they perceived as socially acceptable. Addressing these limitations in future research can enhance the understanding of HIV/AIDS awareness and inform more effective public health interventions.

CONCLUSION AND IMPLICATIONS FOR PUBLIC HEALTH POLICY

These findings highlight the urgent need for comprehensive, targeted public health interventions in the Eastern Province of Saudi Arabia. Educational programs should be tailored to address the specific needs of various demographic groups, particularly those with lower levels

of education. These initiatives should focus on correcting misconceptions and providing accurate information about HIV transmission, prevention, and treatment.

To enhance the reach and impact of these educational efforts, it is crucial to engage community leaders and leverage media platforms. By fostering a well-informed public, the region can more effectively combat the spread of HIV and support those living with the virus.

While significant strides have been made in HIV education and prevention, this study reveals ongoing challenges in the Eastern Province. Addressing these gaps through targeted, demographic-specific interventions can significantly improve HIV awareness, reduce new infections, and contribute to a healthier society. By implementing these strategies, the region can make substantial progress in its fight against HIV and improve overall public health outcomes.

AUTHORS' CONTRIBUTIONS

All authors contributed to the conception and design of the study, data collection and analysis, writing, and approval of the final manuscript.

LIST OF ABBREVIATIONS

HIV	=	Human Immunodeficiency Virus
AIDS	=	Acquired Immunodeficiency Syndrome
IRB	=	Institutional Review Board
MOH	=	Ministry of Health
KSA	=	Kingdom of Saudi Arabia
PrEP	=	Pre-Exposure Prophylaxis
PEP	=	Post-Exposure Prophylaxis
UNAIDS	=	Joint United Nations Program on HIV/AIDS
MTCT	=	Mother-to-Child Transmission

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of the Ministry of Health, Dammam Medical Complex-DMC-D, Eastern Health Cluster, Ministry of Health, Saudi Arabia (Approval No: IM-21, Date: 13/02/2024).

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

The study involved an anonymous questionnaire and did not collect any personal or sensitive health information. All participants were informed about the purpose of the study, and verbal consent was obtained prior to participation.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article

FUNDING

This research received no external funding and was conducted independently by the authors.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this study. All authors have disclosed no financial or personal relationships that could be perceived as influencing the research presented.

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