

Prevalence of and Factors Associated with Advanced HIV Disease in Wangaya Denpasar General Hospital Period from January 2022 to December 2023



AAA Mita Astari¹, Ketut Suryana²

^{1,2}Department of Internal Medicine, Wangaya HIV Study Group, Merpati Clinic, Wangaya General Hospital in Denpasar, Bali, Indonesia

Corresponding author:

Ketut Suryana

ketutsuryana@gmail.com

ABSTRACT

Objective: Advanced HIV disease (AHD) remains a significant health problem and cause of mortality among people living with HIV/AIDS. Various psychosocial factors, including social support, human resources, and depression, are associated with AHD. This study aimed to determine the prevalence of and factors associated with AHD at Wangaya Denpasar General Hospital from January 2022 to December 2023.

Methods: This cross-sectional study included all newly diagnosed AHD patients at Merpati clinic, Wangaya General Hospital, from January 2022 to December 2023, who met the inclusion and exclusion criteria. Data were collected through a review of patients' complete medical records.

Results: Of 128 newly diagnosed people living with HIV/AIDS (PLWHA), 84 (65.6%) were defined as having AHD. The majority of PLWHA with AHD were male (73.8%), under 50 years old (82.1%), without college education (94.0%), unemployed (83.3%), married (54.8%), had medical insurance (90.5%), contracted HIV through heterosexual contact (90.5%), were referred from other medical facilities (82.1%), and had social support (98.8%). Factors significantly associated with AHD included lack of college education ($p=0.000$), unemployment ($p=0.000$), marital status ($p=0.037$), and referral source ($p=0.010$).

Conclusion: Lack of college education, unemployment, marital status, and referral from other medical facilities were associated with AHD. To reduce AHD-related morbidity and mortality, it is crucial to strengthen HIV/AIDS education and training programs, and scale up HIV testing through provider-initiated testing and counseling. This approach may enable clinicians to prevent and diagnose HIV earlier.

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Correspondence to:

Ketut Suryana

ketutsuryana@gmail.com

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Keywords:

HIV/AIDS, Advance HIV Disease, Factors associated

INTRODUCTION

The Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) pose significant health challenges worldwide (UNAIDS, 2023). Ensuring effective HIV testing is crucial, guided by the 5C principles: informed consent, confidentiality, counseling, accurate test results, and connections to care, treatment, and prevention services (PNPKHIV, 2019).

UNAIDS estimates that by 2022, approximately 39 million people globally are living with HIV, with 1.3 million newly diagnosed cases and 630,000 AIDS-related deaths (UNAIDS, 2023). In Indonesia, the HIV control agency (PIMS) reported 10,525 cases in the first quarter of 2022 across 34 provinces, with 30.2% of cases among homosexual individuals (MSM and transgender individuals) (Kemenkes RI, 2022). Bali, specifically, witnessed 30.9% of AIDS cases occurring in the 30-39 age group (Provinsi Bali, 2020).

Despite progress, challenges persist. In 2021, 650 people succumbed to AIDS-related complications, highlighting the importance of addressing advanced HIV disease (WHO, 2023). Advanced HIV disease, defined as a CD4+ count below 200 cells/mm³ or WHO stage 3 or 4, remains a critical concern (Hartley, 2021).

Risk factors play a pivotal role. People who use drugs (PWID) and heterosexual individuals face higher risks of advanced HIV disease, while MSMs exhibit better testing rates (Hu et al., 2019). However, effective testing strategies for heterosexuals remain elusive, necessitating comprehensive screening programs to reduce delayed diagnoses.

Psychosocial factors also influence outcomes. Social support, human resources, and awareness impact advanced HIV disease (Jiang et al., 2020). Researchers aim to explore demographic and structural factors related to advanced HIV disease, providing valuable insights for comprehensive HIV management (Jiang et al., 2020).

METHODS

Study Design

This cross-sectional study was conducted from May 30 to July 30, 2024, at Wangaya Regional General Hospital in Denpasar, Bali, Indonesia. The study included 126 participants and received ethical clearance from the hospital's Ethics Committee.

Participants

The study included all newly diagnosed HIV/AIDS patients at Wangaya Regional General Hospital from January 2022 to December 2023 who met the inclusion criteria: age over 18 years, WHO HIV stage 3-4 or CD4 count <200 cells/ml. Exclusion criteria were unconscious patients without family members present and incomplete medical records. Purposive consecutive sampling was used to select participants.

Variables and data source

Data were collected from patients' medical records, including demographic and socioeconomic information such as sex, age, education, occupation, marital status, medical insurance, transmission route, sample source, social support, and AHD diagnosis (WHO stage 3 or 4, or CD4 count <200 cells/mm³).

Statistical analysis

Data were processed using Microsoft Excel and analyzed with IBM SPSS version 24.0. Univariate analysis explored individual variables. Bivariate analysis using Chi-square tests identified factors associated with AHD, with $p < 0.05$ considered statistically significant. Variables with $p < 0.25$ in bivariate analysis were included in multivariate logistic regression analysis.

RESULTS

Table 1. Demographic and socioeconomic data of Advance HIV Disease.

Variable	Categories	(N)	(%)
Stage HIV	Stage 3&4 or CD4 count <200 sel/mm3	84	65,6
Sex	Male	62	73,8
	Female	22	26,2
Age (years)	<50	69	82,1
	≥50	15	17,9
Education	College or above	5	6,0
	High School or below	79	94,0
Employment	Currently employed	14	16,7
	Unemployed	70	83,3
Marital status	Married	46	54,8
	Unmarried (divorce/single)	38	45,2
Medical Insurance	Yes	76	90,5
	No	8	9,5
Jalur Penularan	Heterosexual	76	90,5
	MSM*	8	9,5
Sample source	Medical facilities	69	82,1
	VCT clinics*	15	17,9
Social support	Yes	83	98,8
	No	1	1,2

In this study, we examined a cohort of 128 newly diagnosed HIV patients. Among them, 84 cases were classified as Advanced HIV Disease (AHD), representing 65.5% of the total sample. The majority of participants were male (73.8%), while 22 were female (26.2%). The age distribution revealed that 82.1% of patients were younger than 50 years old, with the remaining 17.9% aged 50 or older. Furthermore, 94.0% of participants had a high school education or lower, and 83.3% were unemployed. Regarding marital status, 54.8% of participants were married, while the rest were either single or divorced. Notably, 90.5% of patients had medical insurance coverage, with only eight individuals (9.5%) lacking insurance. Heterosexual contact was the most common mode of transmission, accounting for approximately 90.5% of cases. Interestingly, 82.1% of patients reported referral from other medical facilities, while 17.9% were diagnosed at

voluntary counseling and testing (CT) clinics. Lastly, it is worth noting that individuals presenting with AHD reported having social support during testing, with a high rate of 98.8%.

Table 2. Bivariate and Multivariate logistic regression analysis on the associated factors with Advanced HIV Disease.

Variable	Non-AHD(%)	AHD(%)	Crude OR(95% CI)	p	Adjusted OR (95% CI)*	p
Total	44 (34.4)	84 (65.6)				
Education						
• College or above	34(77.2)	5(6.0)	0,01 (0,00-0,05)	0.000	29,85(5,24-169,90)	0.000
• High school or below	10 (22.8)	79(94.0)				
Employment						
• Currently employed	42 (95.4)	14 (16.7)				
• Unemployed	2 (4.6)	70(83.3)	0,01 (0,00-0,04)	0.000	80,99 (11,41-574,81)	0.000
Marital status						
• Married	36 (81.8)	46 (54.8)	0,26 (0,11-0,64)	0.002	59,81(2,68-1334,18)	0.037
• Unmarried (divorce/single)	8 (18.2)	38 (45.2)				
Medical Insurance						
• Yes	44 (100)	76 (90.5)		0.034		
• No	0	8 (9.5)				
Transmission route						
• Heterosexual	40 (90.9)	76 (90.5)	0,95(0,27-3,34)	0.936		
• MSM	4 (9.1)	8 (9.5)				
Sample source						
• Medical facilities	43 (97.7)	69 (82.1)	0,10(0,01-0,83)	0.011	6.24 (1,12-34,81)	0.010
• VCT clinics	1 (2.3)	15 (17.9)				
Social support						
• Yes	44 (100)	83 (98.8)		0.467		
• No	0	1 (1.2)				

*Only variable with p value <0.25 were included in multivariate analysis.

DISCUSSION

In this study, we investigated the prevalence of Advanced HIV Disease (AHD) and its associated risk factors. Our sample consisted of 126 newly diagnosed HIV patients, among whom 84 cases were classified as AHD (65.5%). The majority of participants were male (73.8%), while 26.2% were female. The age distribution revealed that 82.1% of patients were younger than 50 years old, with the remaining 17.9% aged 50 or older.

Previous research has reported similar findings regarding AHD frequency. Stöger et al. (2022) observed comparable results in a total sample of 2498 individuals, with 1553 cases of AHD and 945 cases of non-AHD. Notably, older age groups (33-48 years old) were more affected by AHD. Pablo F. et al. (2020) conducted a study across Latin America (Argentina, Brazil, Chile, Honduras, Mexico, Peru) and found a male predominance (6952 cases) over women, particularly in the age range of 28-42 years.

In Vietnam, Dat et al. (2021) reported that AHD (809 cases) exceeded non-advanced HIV disease. Men (872 cases) were predominantly affected, with the highest prevalence observed in the 18-35 age group (657 cases). Nyuma et al. (2022) studied CD4 outcomes and identified 48 AHD patients out of 77, primarily aged 31-45 years old. Similarly, a study in Botswana (Lebelonyane et al., 2020) revealed 223 cases of AHD out of 430, with a male predominance (219 cases) and an age range of 32-46 years.

Our analysis also explored the association between AHD and educational status. Based on processed data, we found a significant correlation ($p < 0.05$) between AHD and educational attainment (high school or below). This aligns with previous studies. S.S. Li et al. (2024) conducted a retrospective cohort study in southwestern China, demonstrating that education plays a role in AHD risk ($p = 0.0001$). Similarly, Oboho et al. (2024) examined AHD in eastern Africa and Nigeria, emphasizing the importance of educational level ($p = 0.001$).

Jiang et al. (2020) investigated risk factors in newly diagnosed HIV patients in Guangdong Province, China, and identified a correlation between AHD and education ($p = 0.0046$). However, challenges persist, including low HIV knowledge and limited access to testing and treatment,

especially in rural Ethiopian communities (Lifson et al., 2019). Public awareness remains crucial in preventing HIV infections (Jiang et al., 2020).

In this study, we explored the relationships between employment status, marital status, and health insurance coverage in the context of Advanced HIV Disease (AHD). Our findings shed light on the impact of these factors on disease progression. We observed a significant association between unemployment and AHD ($p < 0.05$). Specifically, unemployed individuals were more likely to experience AHD. This result aligns with previous research conducted in rural Ethiopia (Lifson et al., 2019) and across Uganda, Tazmania, and Kenya (Oboho et al., 2024). Additionally, a study in Myanmar spanning from 2003 to 2019 revealed a higher prevalence of AHD among the unemployed (Mesic et al., 2023).

Our bivariate analysis demonstrated a significant relationship between marital status and AHD ($p = 0.002$). Notably, married individuals were more affected by AHD compared to unmarried or divorced individuals. Similar results were reported in Botswana, where the prevalence of AHD was higher among married participants (Lebelonyane et al., 2020). Hongbo Jiang's study also highlighted this association, emphasizing that partners of HIV-reactive individuals faced increased risk, even when unaware of their partner's risky behavior (Jiang et al., 2020).

In our analysis, we found that health insurance coverage was significantly associated with AHD ($p = 0.034$). Respondents with health insurance were more likely to be diagnosed at HIV stages 3 and 4. This finding is consistent with other studies, such as Jiang et al.'s research, which emphasized the importance of health insurance in managing HIV (Jiang et al., 2020). However, it is essential to recognize that global health insurance coverage remains inadequate, necessitating efforts to achieve the AIDS 2020 targets and ensure long-term coverage for HIV-related care (UNAIDS, 2018).

In this study, we investigated the relationship between transmission routes, sample sources, and social support concerning Advanced HIV Disease (AHD). We examined the association between transmission routes and AHD, focusing on heterosexual, homosexual, and needle drug injection contacts. Contrary to expectations, our analysis revealed no significant relationship ($p > 0.05$). This result aligns with S.S. Li's research, which emphasized the need for evaluating risk factors and interventions to address high-risk populations (Li et al., 2024).

Interestingly, previous studies have highlighted male subpopulations aged >50 years as being particularly affected by heterosexual transmission, contributing to HIV epidemics in certain regions.

Our study found a significant association between sample sources from other medical facilities and AHD ($p = 0.011$). Participants referred from health facilities (308 individuals) outnumbered those who directly visited voluntary counseling and testing (VCT) clinics (78 individuals). Stigma and discrimination at VCT clinics may explain this trend, while VCT clinics play a crucial role in providing HIV knowledge, counseling, and risk reduction strategies (Jiang et al., 2020). Similar results were reported by S.S. Li et al., where both rural and urban respondents were more likely to seek referrals from other medical facilities than to visit VCT clinics directly (Li et al., 2024). Bridget Ainembabazi's research also highlighted the impact of distance, as participants preferred nearby health facilities over distant VCT clinics (Ainembabazi et al., 2024).

Surprisingly, our bivariate analysis did not establish a statistically significant relationship between social support and AHD ($p = 0.467$). Despite respondents often seeking companionship during testing and treatment, this factor did not influence AHD outcomes significantly. This finding echoes research in Kampala, Uganda, where relatives' advice to undergo HIV testing did not necessarily translate into improved subsequent care. Late social support may contribute to disease severity (Ainembabazi et al., 2024).

The study had strict inclusion and exclusion criteria to ensure relevance and quality of data. Inclusion criteria included advanced breast cancer patient populations who were menopausal, with positive hormone receptor (HR) status, using randomized controlled trial (RCT) methods, known population size, publication language in English, and publication year after 2013. Meanwhile, the exclusion criteria included patient populations who were not at an advanced stage of breast cancer, who were pre-menopausal, with negative HR status, using journal review methods, and unclear study results. Aromatase inhibitors are beneficial in treating breast cancer in patients with hormone receptor positive (HR+) status. Functioning by explicitly blocking the enzyme aromatase, which is critical in converting androgens into estrogens, Aromatase Inhibitors reduce the availability of estrogens that fuel cancer growth. Although adjunctive therapies such as metformin or saracatinib may complement the administration of Aromatase Inhibitors, their impact is not significant. However, keep in mind, the use of Aromatase Inhibitors also has side effects, including the risk of increased depression and anxiety in patients, which need to be

carefully managed during treatment. As such, appropriate psychosocial interventions and mental health monitoring are essential to support overall therapeutic success.

CONCLUSION

The prevalence of Advanced HIV Disease patients for the period January 2022-December 2023 at Wangaya Regional Hospital was 84 respondents (65.6%) from a total sample of 128 respondents. The most distribution of risk factors for AHD is as follows: the level of education of non-graduates, unemployed, the marital status is married, with medical insurance, the route of transmission is more heterosexual contact, none of the respondents even use IV- drugs, referrals other medical facilities, having social support. From the results of this research, there is a significant association between non-graduate, unemployed, married, and referral from another health facility.

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AUTHORS CONTRIBUTIONS

All authors contributed to the concept of study. All authors also had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

CONFLICTS OF INTERESTS

All authors have disclosed no conflicts of interest

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