Jurnal Berkala Epidemiologi
Volume 12 No 1. January 2024. 44 – 53
p-ISSN: 2301-7171; e-ISSN: 2541-092X

DOI: 10.20473/jbe.v12i12024.44 – 53
https://e-journal.unair.ac.id/JBE/index
Email: jbe@fkm.unair.ac.id / jbepid@gmail.com

JBE Jurnal Berkala EPIDEMIOLOGI

Jurnal Berkala
EPIDEMIOLOGI
PERIODIC EPIDEMIOLOGY JOURNAL

ORIGINAL ARTICLE

ADHERENCE DETERMINANT ANALYSIS OF PLHIV ON ARV (ANTIRETROVIRAL) THERAPY IN SITUBONDO DISTRICT

Analisis Determinan Kepatuhan ODHA dalam Menjalani Terapi ARV (Antiretroviral) di Kabupaten Situbondo

Winda Cindy Wulandari[1], Mei Syafriadi[2], Rini Riyanti[3], Wiwien Sugih Utami[4], Rondhianto[5]
[1]Health Sciences Postgraduate Program, Universitas Jember, Jember, Indonesia, 68121, 212520102028@mail.unej.ac.id
[2]Faculty of Dentistry, Universitas Jember, Jember, Indonesia, 68121, didiriadihsb.fkg@unej.ac.id
[3]Faculty of Medicine, Universitas Jember, Jember, Indonesia, 68121, riniriyanti.fk@unej.ac.id
[4]Faculty of Medicine, Universitas Jember, Jember, Indonesia, 68121, wiwien.dr@unej.ac.id
[5]Faculty of Nursing, Universitas Jember, Jember, Indonesia, 68121, rondhianto@unej.ac.id
Corresponding Author: Mei Syafriadi, didiriadihsb.fkg@unej.ac.id, Faculty of Dentistry, Universitas Jember, Jember, 68121, Indonesia

ARTICLE INFO

Article History:
Received, May, 29th, 2023
Revised form, August, 28th, 2023
Accepted, October, 18th, 2023
Published online, January, 26th, 2024

Keywords:
Human Immunodeficiency Virus (HIV);
Acquired Immune Deficiency Syndrome (AIDS);
Antiretroviral (ARV);
People Living with HIV/AIDS (PLHIV)

Kata Kunci:
Human Immunodeficiency Virus (HIV);
Acquired Immune Deficiency Syndrome (AIDS);
Antiretroviral (ARV);
ODHA (Orang Dengan HIV/ AIDS)

ABSTRACT

Background: Human Immunodeficiency Virus (HIV) infection causes Acquired Immune Deficiency Syndrome (AIDS), a collection of symptoms arising from the deteriorating immunity. The number of people living with HIV worldwide continues to increase year-by-year. Those infected with HIV need antiretroviral (ARV) therapy to suppress the amount of HIV in the body. **Purpose:** This study aimed to investigate the determinants of adherence in people living with HIV/AIDS (PLHIV) undergoing ARV therapy in Situbondo Regency. **Methods:** This study employed a quantitative analytic observational approach with a cross-sectional design. Data analysis involved both descriptive and multivariate analysis. The population for this study consisted of 328 individuals, from which 212 were selected as samples, all being PLHIV on ART as of April 2022, sourced from ARV treatment services in Situbondo district. **Results:** The research analysis was based on predisposing factors, measured using three indicators: work, knowledge, and belief in ARVs. Supporting aspects were measured by two factors: ownership of health insurance and adherence counselling. Reinforcing factors were measured using two indicators: family support and stigma in the community. **Conclusion:** The study concluded that predisposing and reinforcing factors significantly influenced PLHIV adherence to antiretroviral therapy. However, supporting factors did not show a significant influence on adherence in PLHIV undergoing antiretroviral therapy in the Situbondo District.

ABSTRAK

Latar Belakang: *Infeksi Human Immunodeficiency Virus (HIV)*

How to Cite: Wulandari, W. C., Syafriadi, M., Riyanti, R., Utami, W. S., & Rondhianto, R. (2024). Adherence determinant analysis of PLHIV on ARV (antiretroviral) therapy in Situbondo district. *Jurnal Berkala Epidemiologi*, *12*(1), 44-53. https://dx.doi.org/10.20473/jbe.v12i12024.44-53

menyebabkan Acquired Immune Deficiency Syndrome (AIDS) yang merupakan sekumpulan gejala yang timbul akibat menurunnya imunitas. Jumlah penderita HIV di dunia terus mengalami peningkatan dari tahun ketahun. Orang yang terinfeksi HIV membutuhkan terapi Antiretroviral (ARV) untuk menekan jumlah virus HIV di dalam tubuh ***Tujuan:*** *untuk mengetahui determinan kepatuhan ODHA dalam menjalani terapi ARV di Kabupaten Situbondo.* ***Metode:*** *Jenis dan pendekatan dalam penelitian ini adalah penelitian observasional analitik kuantitatif dengan rancangan cross sectional. Analisis data dalam penelitian menggunakan analisis deskriptif dan multivariat. Populasi dalam penelitian ini adalah 328 orang dan dipilih 212 orang sebagai sampel ODHA on ART hingga bulan April 2022 dari layanan pengobatan ARV di kabupaten Situbondo.* ***Hasil****: Analisis penelitian didasarkan pada faktor predisposisi yang diukur dengan tiga indikator yaitu pekerjaan, pengetahuan dan keyakinan terhadap ARV. Faktor pendukung diukur dengan dua indikator yaitu kepemilikan jaminan kesehatan dan konseling kepatuhan dan faktor penguat juga diukur dengan dua indikator yaitu dukungan keluarga dan stigma di masyarakat.* ***Simpulan:*** *kesimpulan menunjukkan terdapat factor prediposisi dan faktor penguat dan tidak terdapat pengaruh factor pendukung terhadap kepatuhan ODHA dalam menjalani terapi antiretroviral di Kabupaten Situbondo.*

INTRODUCTION

Human Immunodeficiency Virus (HIV) is a virus that attacks the immune system, specifically white blood cells called CD4 cells (1). As of March 2022, the number of newly-diagnosed People Living with HIV/AIDS (PLHIV) who were still alive and aware of their HIV status was 393.538, with 41% of them already on ART (PLHIV currently undergoing antiretroviral therapy) (2). PLHIV require Antiretroviral (ARV) therapy to suppress the amount of HIV in the body (3).

All PLHIV should receive ARV therapy regardless of their CD4 levels and clinical stage. The HIV Prevention Trial Network (HPTN) 052 has demonstrated that ARV therapy is the most effective measure to prevent HIV transmission today. Early treatment has been shown to prevent severity, provide clinical benefits, increase life expectancy, reduce the incidence of infection in the population, and decrease HIV transmission to non-HIV sexual partners (serodiscordant partners) by 93%. Suppression of Viral Load (VL) levels with ARV therapy is associated with lower viral concentrations in genital secretions in both males and females (4). Adherence to ARV therapy is one of the essential factors in the successful treatment of PLHIV, as continuous ARV therapy can improve their quality of life (5).

Predisposing factors that affect PLHIV adherence to ARV therapy include age, gender, marital status, occupation, education, history of changing ARVs, history of side effects, clinical stage, belief in ARVs, and perceived benefits (6). Previous studies have shown that age, gender, income, education level, duration of ARV therapy, occupation, history of side effects, clinical stage, belief in ARVs, knowledge, marital status, and perceived benefits significantly affect adherence to ARV therapy (7,8). Supporting factors that influence PLHIV adherence to ARV therapy include healthcare facilities, the composition of ARV therapy, access to health services, adherence counseling services, and health insurance. These factors significantly affect PLHIV adherence to ARV therapy (9). Additionally, their adherence to ARV therapy is influenced by several reinforcing factors, including the supporting attitude of health workers, family support, stigma in the community, and community support, all of which significantly impact ARV therapy adherence (10,11).

Haj (2020) argued that the majority of HIV patients who experienced Loss to Follow Up (LFU) were non-adherent patients (58.80%) (12). Further, he also noted that adherence to consuming ARVs is a factor that influences a person's behavior in becoming LFU. Meanwhile, PLHIV decision to stop ARV therapy is linked to a greater risk of death due to the deteriorating immune system initially controlled by ARV therapy, rendering the PLHIV vulnerable to opportunistic infections, ultimately leading to death (13).

Previous studies have shown inconsistencies in the factors affecting adherence. However, this issue is still understudied in the Indonesian context. Even the Ministry of Health of Indonesia has not conducted research on PLHIV adherence to ARV therapy to mitigate the increasing number of LFU cases. Meanwhile, the HIV/AIDS Information System data as of April 2022 revealed that only 28% of PLHIV were on ART, while 25% were LFU, and 22% had passed away. Therefore, this study aimed to determine the determinants of PLHIV adherence to ARV therapy in Situbondo Regency, East Java, Indonesia.

METHODS

This study was framed by quantitative analytic observational research utilizing a cross-sectional design. The cross-sectional design was chosen due to its relative ease and cost-effectiveness, its usefulness in identifying factors related to medication adherence, and its potential to generate new hypotheses. Cross-sectional research involves the measurement or observation of independent and dependent variable data at a single point in time.

The independent variables in this study were: predisposing factors (age, gender, marital status, occupation, education, knowledge, history of changing ARVs, history of side effects, clinical stage, belief in ARVs, and perceived benefits), where knowledge refers to the respondents' understanding of ARV therapy, and belief pertaining to the respondents' level of conviction in the benefits and efficacy of ARVs in treating their disease.

The dependent variable in this study was the adherence to ARV therapy, assessed through the Morisky Medication Adherence Scale-8 (MMAS-8) compliance assessment questionnaire. The questionnaire covers various aspects, including whether respondents have ever forgotten to take their medication, whether they have missed medication in the last two weeks, whether they have stopped medication without informing their doctor, whether they have forgotten to take medication while traveling, whether they missed taking medicine the day before, whether they have discontinued medicine when feeling well, whether they feel bothered by the daily medication regimen, and the frequency of forgetting to take medicine daily.

In this type of research, the independent and dependent variables were assessed simultaneously, with no follow-up required. It's important to note that not all research subjects needed to be observed on the exact same day or time. Through this study, we aimed to establish the prevalence or impact of a phenomenon (the dependent variable) and its relationship to the causes (independent variables).

This study was conducted on HIV/AIDS patients seeking treatment in Situbondo Regency in February 2023. The study population consisted of 328 HIV patients or People Living with HIV (PLHIV) on Antiretroviral Therapy (ART) as of April 2022, receiving ARV treatment services in Situbondo District. The sample for this study was composed of PLHIV who had undergone first-line ARV treatment and an assessment of adherence to ARV medication for three consecutive months in 2022. The inclusion criteria were PLHIV who lived in Situbondo, while the exclusion criteria were as follows:

1. PLHIV under 18 years old.
2. PLHIV working as Female Sex Workers (FSWs).
3. PLHIV from the WBP group (inmates of correctional facilities).
4. PLHIV working outside Situbondo Regency.
5. PLHIV whose ARVs are collected by family or a PMO (Supervisor for medication intake)

Based on the inclusion and exclusion criteria, 212 individuals were included in the sample frame and subsequently selected as the sample. Data in this study were analyzed by descriptive and multivariate analysis. Descriptive analysis was utilized to outline the characteristics of the respondents and research variables. Categorical research variables were presented in the form of proportions. For multivariate analysis and hypothesis testing, the Partial Least Square (PLS) method was used. One distinguishing feature of this research is the hypothesis testing using Smart PLS. This study gained ethical clearance from the Ethics Committee of the Faculty of Public Health, the University of Jember, number: 299/KEPK/FKM-UNEJ/II/2023.

RESULTS

Description of Research Variable Indicators

Based on the research results, the following are the characteristics of 139 respondents. The majority of respondents were 26-45 years old (75.54%); 74 (53.24%) were male; 91 (65.47%) were married; 92 (66.19%) were employed. The

highest level of education among the respondents was high school, accounting for 52 respondents (37.41%). 86 respondents (61.87%) had good knowledge; 106 (76.26%) had never changed their ARV medication; 107 (76.98%) had experienced side effects; 45 (32.37%) were at stage 4 when they first started ARVs; 62 (44.6%) felt very confident about ARVs; 106 (76.26%) perceived ARVs as very useful; 134 people (96.40%) had easy access to ARV treatment services; 90 (64.75%) had health insurance; 119 (85.61%) always received compliance counseling services; 137 people (98.56%) perceived that the health workers had positive attitude towards them; 113 (81.29%) received family support; 80 (57.55%) had never experienced stigma in society, and the majority (53 respondents or 38.13%) demonstrated high compliance with ARV therapy.

Description of Predisposing Factors Based on ART Adherence

The cross-tabulation results of 11 predisposing factor indicators and compliance to undergo ART are presented in Table 1. The majority of respondents are adults (aged 26-45 years), comprising of 75.54% of the total, with 40% showing high compliance. Regarding gender indicators, both male and female exhibit high compliance, with proportions of 37.8% and 38.5%, respectively.

Description of Supporting Factors Based on ART Adherence

Supporting factors consist of three indicators that can be described based on the adherence to ARV therapy. Table 2 illustrates that the majority of respondents with high adherence have easy access to ARV treatment services (38.10%), possess health insurance (42.20%), and consistently receive adherence counseling every time they attend the service (38.70%).

Description of Reinforcing Factors Based on ART Adherence

Reinforcing factors consist of three indicators described based on adherence to ARV therapy. Table 3 shows that the majority of respondents with high adherence indicated that they receive positive attitudes from health workers (38.70%), receive family support (43.40%), and have never experienced community stigma (46.50%). Conversely, most respondents with low adherence did not receive family support (53.80%) and had experienced stigma (52.50%).

Based on the processed research data using Smart PLS version 3.0, the research path model is depicted in Figure 1. As shown in Figure 1, the predisposing factor was measured by three indicators: work, knowledge, and belief in ARVs. Supporting factors were measured by two indicators: health insurance ownership and adherence counseling. Additionally, reinforcing factors were measured by two indicators: family support and community stigma.

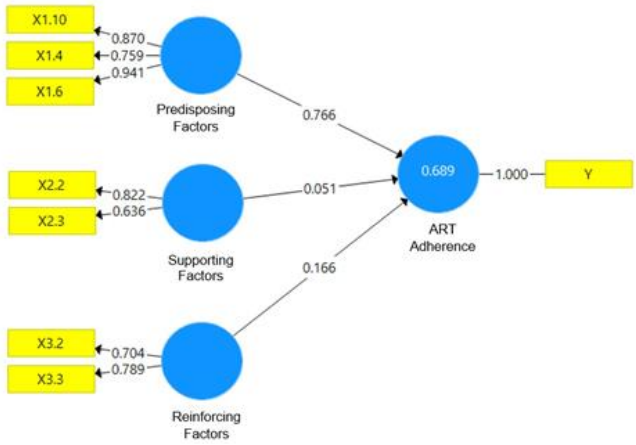

Figure 1. Final Path Diagrams

The results of this study indicate that the predisposition factors, comprising three indicators (work, knowledge, and belief in ARVs), significantly affected ART adherence. This was evidenced by the T-statistics value of 20.15 (> 1.96) and the p-value of 0.01 (< 0.05). The relationship between the predisposing factors and ART adherence was positive, with an effect magnitude of 0.76.

The relationship between supporting factors and ART adherence was also positive, with an effect magnitude of 0.051. However, supporting factors, consisting of two indicators (ownership of health insurance and adherence counseling), did not significantly affect ART adherence, as evident from the T-statistics value of 0.86 (<1.96) and the p-value of 0.38 (>0.05). Therefore, it can be concluded that the supporting factors did not significantly affect PLHIV's compliance with ART due to the insignificant percentage difference.

On the other hand, reinforcing factors, comprising two indicators (family support and community stigma), significantly affect PLHIV's compliance with antiretroviral therapy. This was supported by the T-statistics value of 3.23 (>1.96) and the p-value of 0.01 (<0.05). The relationship between reinforcing factors and ART adherence was positive, with an effect magnitude of 0.16.

Table 1
Cross Tabulation of Predisposing Factors with ART Adherence

Variable	ART Adherence		
	Low (%)	Middle (%)	High (%)
Age			
18-25 (teenager)	8 (72,70)	2 (18,20)	1 (9,10)
26-45 (mature)	30 (28,60)	33 (31,40)	42 (40)
> 45 (elderly)	7 (30,40)	6 (26,10)	10 (43,50)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Gender			
Male	27 (36,5)	19 (25,7)	28 (37,8)
Female	18 (27,7)	22 (33,8)	25 (38,5)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Marital status			
Not married	14 (56)	6 (24)	5 (20)
Divorcee	5 (21,7)	10 (43,5)	8 (34,8)
Married	26 (28,6)	25 (27,5)	40 (44)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Occupation			
Unemployed	31 (66)	10 (21,3)	6 (12,8)
Employed	14 (15,2)	31 (33,7)	47 (51,1)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Education			
No School	1 (16,7)	2 (33,3)	3 (50)
Elementary School	11 (37,9)	6 (20,7)	12 (41,4)
Junior High School	9 (32,1)	8 (28,6)	11 (39,3)
Senior High School	15 (28,8)	14 (26,9)	23 (44,2)
College	9 (37,5)	11 (45,8)	4 (16,7)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**

(Continued)

Table 1
Continued

Variable	ART Adherence		
	Low (%)	Middle (%)	High (%)
Knowledge			
Not enough	44 (83)	7 (13,2)	2 (3,8)
Good	1 (1,2)	34 (39,5)	51 (59,3)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
History of changing ARVs			
Once	20 (60,6)	4 (12,1)	9 (27,3)
Never	25 (23,6)	37 (34,9)	44 (41,5)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
History of side effects			
Once	39 (36,4)	30 (28)	38 (35,5)
Never	6 (18,8)	11 (34,4)	15 (46,9)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Clinical stage			
Stage 1	6 (26,1)	3 (13)	14 (60,9)
Stage 2	8 (29,6)	13 (48,1)	6 (22,2)
Stage 3	16 (36,4)	15 (34,1)	13 (29,5)
Stage 4	15 (33,3)	10 (22,2)	20 (44,4)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Belief in ARVs			
Not sure	41 (100)	0 (0,0)	0 (0,0)
Sure enough	1 (2,8)	19 (52,8)	16 (44,4)
Very confident	3 (4,8)	22 (35,5)	37 (59,7)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**
Perceived Benefits			
Useless	4 (44,4)	0 (0,0)	5 (55,6)
Beneficial	10 (41,7)	7 (29,2)	7 (29,2)
Very helpful	31 (29,2)	34 (32,1)	41 (38,7)
Total	**45 (32,4)**	**41 (29,5)**	**53 (38,1)**

Table 2
Cross Tabulation of Supporting Factors with ART Adherence

Variable	ART Adherence		
	Low (%)	Middle (%)	High (%)
Access to ARV treatment services			
Difficult	3 (60)	0 (0)	2 (40)
Easy	42 (31.30)	41 (30.60)	51 (38.10)
Health Insurance			
No	18 (36.70)	16 (32.70)	15 (30.60)
Yes	27 (30)	25 (27.80)	38 (42.20)
Adherence counseling services			
Not always (Sometimes / Never)	9 (45)	4 (20)	7 (35)
Always get counseling	36 (30.30)	37 (31.10)	46 (38.70)

Table 3
Cross Tabulation of Reinforcing Factors with ART Adherence

Variable	ART Adherence		
	Low (%)	Middle (%)	High (%)
Attitude of Health Officers			
Negative Attitude	1 (50)	1 (50)	0 (0)
Positive Attitude	44 (32.10)	40 (29.20)	53 (38.70)
Family Support			
No Support	14 (53.80)	8 (30.80)	4 (15.40)
Get Support	31 (27.40)	33 (29.20)	49 (43.40)
Stigma in society			
Once	31 (52.50)	18 (30.50)	10 (16.90)
Never	26 (25.70)	28 (27.70)	47 (46.50)

DISCUSSION

The Effect of Predisposing Factors on Adherence of People Living with HIV in Antiretroviral Therapy in Situbondo District

Occupation's Effect on Adherence to ARV Therapy

Demographic data in this study indicate a higher proportion of housewives (30.90%) compared to those in other occupations such as private employees, farmers, self-employed individuals, government employees (state apparatus/Army/policemen/women), and state-owned enterprise employees, with some respondents being unemployed. According to Claudia et al (14), homemakers constitute a relatively large percentage of HIV infections, at 36.67%. This is often influenced by husbands engaging in risky behaviors and being at risk of HIV/AIDS. Occupational status is significantly associated with adherence to ARV therapy (15).

The results of this study indicate that the majority of respondents with high adherence are those with working status (51.10%), particularly private and self-employed individuals. This aligns with the findings of Haryadi et al (16) where the majority of respondents were in private jobs, constituting 56.40% of the sample. Remote work is often associated with risky behaviors in men due to high mobility outside the home, potentially leading to engagement in risky or commercial sexual behaviors (17). People with stable jobs and a good income tend to adhere more to ARV treatment as they are better equipped to meet their treatment requirements.

Knowledge

People living with HIV who possess good knowledge have a better understanding of their disease and the associated risks if they fail to comply with their treatment. Behavioral change is often rooted in one's knowledge (18). Knowledge is a critical factor influencing attitudes and behavior (19). Accurate knowledge about HIV/AIDS enables individuals to avoid risky behaviors associated with HIV/AIDS (20,21). Comprehensive knowledge about ARV therapy allows individuals to enhance their treatment compliance. An adequate level of knowledge about HIV disease and ARV treatment improves the quality of life of people living with HIV (PLHIV), reinforcing the belief that poor

adherence can lead to viral resistance and treatment failure, impacting their health.

Enhancing knowledge necessitates a multidimensional approach to meet the needs of patients. Knowledge is directly linked to the willingness to comply with treatment, with more profound knowledge correlating to increased compliance (22). Communities possessing profound knowledge about their disease tend to motivate themselves and their families to actively manage the disease's consequences, encouraging regular treatment adherence as prescribed by medical professionals (23). As information technology continues to advance and nearly every adult has access to a smartphone, accessing information becomes easier, making health promotion more effective through online channels.

Belief in ARV's

Most respondents with good knowledge had great confidence in ARVs. Belief in the benefits of ARVs influenced the decision to commence ARV therapy and adhere to it. However, it did not significantly affect adherence (p-value = 0.54). There was a high level of confidence among respondents regarding their understanding of ARV treatment as a whole. Respondents also believed that irregular drug use could lead to resistance due to the progression of the disease they are dealing with, making it worse. With this high level of confidence, we expect that respondents will adhere more to ARV therapy (5).

The substantial level of confidence was greatly influenced by the good knowledge of the respondents. This good knowledge was obtained through information provided by health workers with a positive attitude and good communication skills. Thus, it is imperative to enhance the quality and capacity of health workers to support the success of HIV treatment.

The Effect of Supporting Factors on Adherence with PLHIV in Undergoing Antiretroviral Therapy in Situbondo District

The direction of the relationship between supporting factors on ART adherence was positive, and the magnitude of the effect was 0.05. However, the supporting factors of 2 indicators (ownership of health insurance and adherence counselling) did not significantly influence ART adherence. This case can be seen from the T-statistics value of 0.86 (<1.96) or can be seen from the p-value, which was equal to 0.38 (>0.05).

Health Insurance

A total of 110 respondents (79.14%) in this study confirmed their intent to continue visiting health services to collect medicine, even if they did not have the means (of transport). Health insurance constitutes an assured benefit and a right for participants and their family members (24). As per the national health insurance guidebook (JKN) for critical populations published in 2016, health insurance benefits encompass various health services, not contingent on the number of contributions made. Non-medical benefits comprise accommodation and ambulance services. Health insurance benefits encompass promotive, preventive, curative, and rehabilitative services, including medicines and consumable medical services as per medical needs.

Challenges encountered in utilizing health insurance, affecting patient compliance, are related to a complicated health service system, lengthy waiting times, and difficulties in accessing health services. Therefore, it can be deduced that affordable financing, without being coupled with an efficient health service system, could potentially pose an obstacle impacting patient compliance in treatment.

Adherence Counseling

According to Suryanto & Nurjanah (11), counseling is crucial to provide knowledge about PLHIV and help them come to terms with their illness. This knowledge encompasses understanding ARV drug therapy, the significance of therapy adherence, possible side effects, and the duration of treatment. With heightened knowledge, it is expected that PLHIV will adhere to ARV drug therapy as per the doctor's recommendations (25). PLHIV, equipped with adequate knowledge about HIV/AIDS, adapt their behavior to manage their disease, ultimately enhancing their lifespan (26).

Health insurance and compliance counseling services align with the theory, indicating that PLHIV with health insurance exhibit higher compliance than those without, and PLHIV who consistently receive compliance counseling demonstrate higher compliance than those who do not. However, this is insufficient to attribute a significant effect of supporting factors on PLHIV's compliance in undergoing ARV therapy.

The Effect of Reinforcing Factors on Adherence of PLHIV Undergoing Antiretroviral Therapy in Situbondo District

Family support

A majority of respondents, 113 (81.29%), reported receiving support. Among them, 49 (43.40%) displayed high adherence, while the majority of those not receiving family support exhibited low adherence, at 53.80%. PLHIV require intervention through routine and consistent ARV therapy, necessitating assistance from their family and close associates to remind them to take medicine at specific times daily, carry medicine while traveling, and plan for the next dose when their supplies deplete (27).

High family support plays a pivotal role in PLHIV's compliance with ARV therapy. The emotional connection between families and PLHIV fosters a supportive environment, thereby boosting compliance with ARV therapy. Feeling accepted and appreciated encourages adherence to treatment. Support from loved ones serves as a reminder for PLHIV to adhere to their treatment, ensuring effective ARV therapy. In conclusion, better support from PLHIV's families correlates with greater compliance in ARV therapy.

Stigma in society

This study found that 59 (42.45%) respondents had experienced stigma in various environments home, workplace, and health services resulting in 52.50% of them exhibiting low adherence. Respondents acknowledged experiencing stigma in health services (50%), neighborhood (40%), and the remaining instances occurred at school/campus and work. Another study reported a high stigma (60%) among health workers in public health service institutions, including nurses, doctors, midwives, nutritionists, and analysts, towards PLHIV. High stigma levels among health workers negatively impact the provision of health services to PLHIV (28).

PLHIV experiencing high levels of stigma often display poor adherence to ARV therapy. Negative emotions lead to unfavorable reactions, including irregular adherence to ARV therapy. The societal aspect compels PLHIV to restrict interactions with others, often avoiding ARV drugs when outside their familiar environment to prevent disclosing their HIV status.

CONCLUSION

The predisposing factors, including occupation, knowledge, and belief in ARVs, significantly influenced the adherence among PLHIV undergoing antiretroviral therapy in Situbondo District. Conversely, supporting factors such as health insurance and adherence counseling services did not show any significant influence on PLHIV's adherence in undergoing antiretroviral therapy in Situbondo District. However, reinforcing factors, particularly family support and societal stigma, significantly impacted on the adherence of PLHIV undergoing antiretroviral therapy in Situbondo District.

CONFLICT OF INTEREST

The authors declare no conflict interest in this study.

AUTHOR CONTRIBUTIONS

WCW: Conceptualization, original writings preparation, methodology, software, review, visualization, editing, and validation. MS: Methodology, data curation, writing-reviewing, and supervision. RR: Methodology, writing-reviewing, and supervision.

ACKNOWLEDGMENTS

We would like to extend our uttermost gratitude to all respondents for participating in this study and to the University of Jember.

REFERENCES

1. WHO. Latest HIV estimates and update on COVID-19 distributions, July 2022. World Heal Organ. 2022;(July):1–34.
2. Ministry of Health Republic Indonesia. Executive report on the development of HIV, AIDS and sexually transmitted infectious diseases (PIMS) first quarter of 2022. Jakarta: Kemenkes RI; 2022.
3. Adiningsih S, Kridaningsih TN, Widiyanti M, Wahyuni T. predictor of anemia among people living with hiv taking tenofovir+lamivudine+efavirenz therapy in Jayapura, Papua Jurnal Berkala Epidemiologi. 2023;11(1):32–9.
4. Fokam J, Sosso SM, Yagai B, Billong SC, Djubgang Mbadie RE, Kamgaing Simo R,

et al. Viral suppression in adults, adolescents and children receiving antiretroviral therapy in Cameroon: Adolescents at high risk of virological failure in the era of "test and treat." AIDS Res Ther. 2019;16(1):10–7.

5. Kensanovanto A, Perwitasari DA. Level of compliance and success of therapy in people with HIV/AIDS. Borobudur Pharm Rev. 2022;2(2):31–5.
6. Debby C, Sianturi SR, Susilo WH. Factors related to compliance of arv medication in HIV patients at RSCM Jakarta. J Keperawatan. 2019;10(1):16.
7. Mabunda K, Ngamasana EL, Babalola JO, Zunza M, Nyasulu P. Determinants of poor adherence to antiretroviral treatment using a combined effect of age and education among human immunodeficiency virus infected young adults attending care at letaba hospital hiv clinic, Limpopo Province, South Africa. Pan Afr Med J. 2019;32:1–14.
8. Dorcélus L, Bernard J, Georgery C, Vanessa C. Factors associated with antiretroviral therapy adherence among people living with HIV in Haiti: a cross-sectional study. AIDS Res Ther. 2021;18(1):1–9.
9. Djumadi J, Gobel FA, Arman. Factors associated with adherence to antiretroviral therapy (ARV) in HIV/AIDS sufferers at Bhayangkara Hospital, Makassar City in 2022. J Muslim Community Heal. 2023;4(1):78–90.
10. Villiera JB, Katsabola H, Bvumbwe M, Mhango J, Khosa J, Silverstein A, et al. Factors associated with antiretroviral therapy adherence among adolescents living with HIV in the era of isoniazid preventive therapy as part of HIV care. PLOS Glob Public Heal. 2022;2(6):e0000418.
11. Suryanto Y, Nurjanah U. Adherence to taking Anti-Retro Viral (ARV) medications in HIV/AIDS patients. J Ilmu Keperawatan Indones. 2021;2(1):14.
12. Haj JDK. Risk factors for lost to follow up in HIV sufferers undergoing ARV treatment at Sumberjambe Community Health Center and Sukowono Community Health Center. Universitas Jember; 2020.
13. Murray BR, Kratka A, Scherr KA, Eyal N, Blumenthal-Barby J, Freedberg KA, et al. What risk of death would people take to be cured of HIV and why? A survey of people living with HIV. J Virus Erad. 2019;5(2):109–15.
14. Claudia RO, Rahmawati D, Fadraersada J. Description of the characteristics, treatment patterns and compliance of HIV/AIDS patients in Samarinda City. Proceeding Mulawarman Pharm Conf. 2018;8(November):104–10.
15. Sutini S, Cahyati WH, Rahayu R. Socio-demographic factors associated with loss to follow up anti retro viral therapy among people living with HIV and AIDS in Semarang City. Public Heal Perspect J Sutini Sutini. 2020;5(3):2020–186.
16. Haryadi Y, Sumarni S, Angkasa M. Type of work and level of education influence adherence to taking antiretroviral drugs (ARV) in HIV/AIDS patients. J Lintas Keperawatan. 2020;1(1):1–8.
17. Azeze GA, Gebeyehu NA, Wassie AY, Mokonnon TM. Factors associated with risky sexual behaviour among secondary and preparatory students in Wolaita Sodo town, Southern Ethiopia; Institution based cross-sectional study. Afr Health Sci. 2021;21(4):1830–41.
18. Duckworth AL, Gross JJ. Behavior change. Organ Behav Hum Decis Process. 2020;161(S):39–49.
19. Rumahorbo KN, Syarifah S, Anggraini DR, Siregar KB, Amelia R, Sari MI. Factors influence the knowledge, attitudes, and behavior of community about COVID-19 vaccine in Medan City, Indonesia. Open Access Maced J Med Sci. 2022;10(E):371–7.
20. Arisdiani T, Prasetya HA, Tinggi S, Kesehatan I, Tengah J. Study of knowledge and sexual behavior in the prevention of HIV/AIDS in non-professional personnel in kendal District. 2020;1(1):177–86.
21. Shamu S, Khupakonke S, Farirai T, Slabbert J, Chidarikire T, Guloba G, et al. Knowledge, attitudes and practices of young adults towards HIV prevention: An analysis of baseline data from a community-based HIV prevention intervention study in two high HIV burden

districts, South Africa. BMC Public Health. 2020;20(1):1–10.

22. Palupi J, Maryanti SA, Subiastutik E, Firmansyah FF. The effectiveness of literacy stimulation model based on multisensory development of the results of DDST. J Phys Conf Ser. 2020;1563:12056.
23. Marianingrum D, Amelia C. The relationship between the level of knowledge and compliance with treatment for hypertension sufferers at the Baloi Permai Community Health Center, Batam City. Zo Kedokt Progr Stud Pendidik Dr Univ Batam. 2020 Jun;9(1):81–91.
24. Martha E, Lestari H, Zulfa RS, Sopamena Y. National health insurance scheme: Internal and external barriers in the use of reproductive health services among women. Kesmas. 2021;16(2):91–9.
25. Gandhi RT, Bedimo R, Hoy JF, Landovitz RJ, Smith DM, Eaton EF, et al. Antiretroviral drugs for treatment and prevention of HIV Infection in adults: 2022 recommendations of the international antiviral Society-USA Panel. Jama. 2023;329(1):63–84.
26. Fauk NK, Ward PR, Hawke K, Mwanri L. HIV stigma and discrimination: perspectives and personal experiences of healthcare providers in Yogyakarta and Belu, Indonesia. Front Med. 2021;8(May):1–11.
27. Hutahaean BSH, Stutterheim SE, Jonas KJ. Barriers and facilitators to hiv treatment adherence in Indonesia: perspectives of people living with HIV and HIV service providers. Trop Med Infect Dis. 2023;8(3):138.
28. Wilandika A. Health care provider stigma on people living with HIV / AIDS (PLWHA) in Bandung. 2019;10(1):7–15.