



The Relationship Between Self-Efficacy and Antiretroviral Medication Adherence Among People Living with HIV: A Cross-Sectional Study at CAKAP WPA Turen Foundation

Tri Nurhudi Sasono^{1*}, Nia Agustiningsih¹,
Galuh Kumalasari¹, Lintang Puspita Prabarini¹,
Ainun Hurrotaini¹, Lailatul Kodriyah², Ella Mayasari²,
Zahrah Saad³

- 1 Nursing Study Program, Universitas Kepanjen, Malang, Indonesia
- 2 Hospital Administration Study Program, Universitas Kepanjen, Malang, Indonesia
- 3 Faculty of Nursing and Midwifery, Mahsa University, Malaysia

Correspondence

Tri Nurhudi Sasono,
Nursing Study Program, Universitas Kepanjen.

Jl. Trunojoyo No.16, Panggungrejo,
Kepanjen, Malang, East Java 65163,
Indonesia.

Email: trisasono02@gmail.com

Article History

Submitted: 27-05-2026

Revised: 22-08-2026

Accepted: 26-09-2026

This is an open-access article under
the CC BY-SA license.



ABSTRACT

Background: Antiretroviral (ARV) therapy is essential for people living with HIV(PLHIV) to control viral replication and maintain long-term health. However, maintaining adherence to ARV therapy remains a challenge. Self-efficacy, defined as an individual's confidence in their ability to perform health-related behaviors, may play an important role in maintaining consistent adherence to ARV medication. **Purpose:** This study aimed to determine the relationship between self-efficacy and adherence to ARV medication among people living with HIV at Yayasan Cahaya Kasih Peduli WPA Turen, Malang Regency, Indonesia. **Methods:** This study used a quantitative descriptive-analytic design with a cross-sectional approach. The study involved 70 PLHIV selected using purposive sampling. Data were collected using a self-efficacy questionnaire and an ARV medication adherence questionnaire. Self-efficacy was categorized as high or low based on the instrument's predetermined cut-off score, while ARV adherence was categorized as adherent or non-adherent based on the adherence instrument's predetermined cut-off score. Data were analyzed using univariate and bivariate analyses, with statistical significance set at $p \leq 0.05$. **Results:** Of the 70 respondents, 48 (68.6%) had high self-efficacy and 22 (31.4%) had low self-efficacy. A total of 52 respondents (74.3%) were adherent to ARV therapy, while 18 (25.7%) were non-adherent. Among respondents with high self-efficacy, 42 (87.5%) were adherent and 6 (12.5%) were non-adherent, compared with 10 (45.5%) adherent and 12 (54.5%) non-adherent among those with low self-efficacy. Statistical analysis demonstrated a significant relationship between self-efficacy and ARV adherence ($p=0.001$). Respondents with high self-efficacy had seven times greater odds of adhering to ARV therapy than those with low self-efficacy ($OR=7.00$; $95\% CI=2.20-22.28$). **Conclusions:** Self-efficacy was significantly associated with ARV medication adherence among PLHIV at Yayasan Cahaya Kasih Peduli WPA Turen. Strengthening self-efficacy through continuous counseling, education, peer support, and community-based assistance may support sustained adherence to ARV therapy. Further longitudinal and intervention studies are recommended to determine the effectiveness of self-efficacy-based approaches in improving long-term ARV adherence.

KEYWORDS

Self-efficacy, Antiretroviral therapy, Medication adherence, People living with HIV, HIV/AIDS

How to cite:

Sasono, T. N., Agustiningsih, N., Kumalasari, G., Prabarini, L. P., Hurrotaini, A., Kodriyah, L., Mayasari, E., & Saad, Z. (2026). The Relationship Between Self-Efficacy and Antiretroviral Medication Adherence Among People Living with HIV: A Cross-Sectional Study at CAKAP WPA Turen Foundation. *Journal of Rural Community Nursing Practice*. 4(2), 345-365. <https://doi.org/10.58545/jrcnp.v4i2.1008>

1. BACKGROUND

HIV remains a public health issue requiring long-term, continuous management. Advances in antiretroviral (ARV) therapy have extended the life expectancy of people living with HIV, leading to the condition increasingly being viewed as a chronic illness that requires ongoing health management. Managing HIV involves not only the success of ARV therapy but also continuity of care, psychosocial support, health monitoring, and individual engagement with health services. An HIV care approach centred on individual needs is essential to maintain engagement with health services and ensure the sustainability of care (WHO, 2021). Despite advancements in HIV therapy, people living with HIV (PLHIV) continue to face various social and psychological challenges in their daily lives. Stigma and discrimination remain significant obstacles. Qualitative research in Indonesia indicates that PLHIV encounter stigma and discrimination within their families, communities, and healthcare facilities. These issues are linked to a lack of knowledge about HIV, fear of transmission, and social and moral perceptions regarding HIV and PLHIV. Such experiences of stigma can affect the comfort and willingness of

PLHIV to access healthcare services (Fauk et al., 2021).

Stigma and discrimination are critical issues because HIV management requires the sustained involvement of people living with HIV (PLHIV) in healthcare services. Research in Indonesia indicates that the needs of PLHIV extend beyond medical treatment to include freedom from stigma and discrimination, access to social support and information, and the availability of accessible and affordable healthcare services. Therefore, healthcare workers need to understand the needs of PLHIV through their experiences and perspectives to ensure that the services provided are comprehensive and holistic (Ibrahim et al., 2022). The need for comprehensive care demonstrates that HIV services cannot simply focus on the provision of antiretrovirals (ARVs). People living with HIV (PLHIV) require services that address physical, psychological, and social aspects, as well as other health needs. Understanding the experiences of PLHIV in accessing care is crucial, as individual perceptions regarding safety, comfort, acceptance, and support can influence their engagement in treatment. A person-centered approach is a strategy for tailoring services to the specific needs of PLHIV

(Ibrahim et al., 2022). In addition to services provided by healthcare professionals, support from fellow people living with HIV (PLHIV) or peer supporters plays a crucial role. Peer supporters share relatively similar experiences, enabling them to offer emotional support, motivation, information, and a sense of acceptance to PLHIV. Qualitative research indicates that peer support can provide emotional backing, foster a sense of belonging, strengthen social connections, and assist PLHIV in navigating the various experiences associated with living with HIV. Furthermore, peer support can create a safer environment for PLHIV to discuss their experiences and needs (Øgård-Repål et al., 2022).

Peer support is becoming increasingly important in the context of stigma and the disclosure of HIV status. When people living with HIV (PLHIV) feel afraid or uncomfortable revealing their status to others, the presence of a peer supporter can serve as a source of support, enabling individuals to find a sense of safety and acceptance. Qualitative research findings indicate that peer support can help PLHIV gain emotional support, build a sense of belonging, and strengthen their confidence in managing the disease. Services that

provide a safe space and individualized support can also help meet the diverse needs of PLHIV (Øgård-Repål et al., 2022). In HIV management, the focus on the health of people living with HIV (PLHIV) needs to extend beyond successful therapy to encompass comprehensive health monitoring. PLHIV may face various physical and psychosocial health needs while living with HIV. Therefore, continuous healthcare services must provide PLHIV with opportunities to access information, examinations, support, and follow-up care tailored to their needs. Meeting these needs can help maintain the connection between PLHIV and healthcare services (Ibrahim et al., 2022). A community-based approach can serve as a strategy to bring health services closer to people living with HIV (PLHIV). The involvement of community organizations, healthcare workers, and peer support workers enables service delivery in a more familiar environment, potentially enhancing the participants' sense of safety. In the context of HIV care, flexible models tailored to individual needs are crucial for fostering patient engagement and ensuring the continuity of care. Such approaches also provide individuals with opportunities to access social support and services that align with their specific circumstances. One

example of promotive and preventive public health efforts in Indonesia is the Free Health Check-up Program (CKG). This program aims to improve public access to health screenings and early detection. For PLHIV, health screenings offer an opportunity to address holistic health needs rather than focusing solely on antiretroviral (ARV) therapy. However, the utilization of these screenings by PLHIV is influenced not only by service availability but also by their personal experiences, sense of safety, available support, and perceived social barriers. These factors indicate that implementing health screenings for PLHIV must take participants' experiences into account. Screenings conducted in a safe environment—supported by communicative healthcare workers and peer support—can offer a service experience that differs significantly from care focused exclusively on clinical examinations. Previous research demonstrates that the healthcare experiences of PLHIV are closely linked to their needs for acceptance, social support, service access, and freedom from stigma (Ibrahim et al., 2022). In Indonesia, the issue of stigma persists within healthcare facilities. Research by Fauk et al. indicates that stigma against people living with HIV (PLHIV) can originate not only from the

community and family but also within the healthcare environment. These findings highlight the importance of establishing services that are safe, welcoming, and non-discriminatory, ensuring that PLHIV are not further deterred from accessing healthcare (Fauk et al., 2022). Given these circumstances, it is important to understand the health screening experiences of people living with HIV/AIDS (PLWHA) when receiving community-based support. A qualitative approach is required to explore the experiences, perceptions, barriers, needs, and personal meanings associated with the services received. Previous qualitative research indicates that PLWHA's experiences with stigma, service needs, and peer support are crucial and must be understood from their own perspectives. At the Cahaya Kasih Peduli (CAKAP) WPA Turen Foundation, free health check-up support activities are conducted involving people living with HIV/AIDS (PLWHA), healthcare workers, and peer support workers. These activities encompass not only medical examinations but also education, communication, discussion, and guidance throughout the service process. This setting provides crucial context for exploring PLWHA experiences with these health check-ups, including the barriers they

encounter and the roles of healthcare workers and peer support workers in fostering safety and providing support. A review of existing literature reveals that research on PLWHA has extensively addressed stigma and discrimination, healthcare service needs, and experiences with peer support. However, studies specifically exploring the experiences of PLWHA with community-based free health check-up support, particularly within local support organizations, remain limited. Therefore, this study aims to explore the experiences of PLWHA participating in community-based free health check-up support at the CAKAP WPA Turen Foundation, including service experiences, barriers to access, support from healthcare workers and peer support workers, and expectations regarding the program's sustainability.

2. METHODS

Design

This study employed a quantitative descriptive-analytic research design with a cross-sectional approach. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional

studies. The study was conducted to examine the relationship between self-efficacy and adherence to antiretroviral (ARV) medication among people living with HIV (PLHIV). In a cross-sectional design, the independent and dependent variables were measured simultaneously during the study period.

Sample and setting

The study was conducted at Yayasan Cahaya Kasih Peduli (CAKAP) WPA Turen, Malang Regency, East Java, Indonesia, in conjunction with community-based health assistance activities. The study population consisted of ODHIV/ODHA who were members of or received assistance from the CAKAP WPA Turen peer-support group.

A total of 70 ODHIV/ODHA were recruited as respondents through purposive sampling. The inclusion criteria were: (1) ODHIV/ODHA aged ≥ 18 years; (2) registered as a member or recipient of services at Yayasan CAKAP WPA Turen; (3) currently receiving ARV therapy; (4) able to communicate effectively; and (5) willing to participate by providing informed consent. Respondents who were unable to complete the questionnaire or withdrew from the study were excluded.

Variable

The independent variable in this study was self-efficacy, while the dependent variable was ARV medication adherence. Respondent characteristics were also collected, including age, sex, education level, occupation, duration of HIV diagnosis, and duration of ARV treatment.

Self-efficacy was defined as the respondent's confidence in their ability to manage their health condition and consistently carry out behaviors required for HIV treatment, particularly adherence to ARV therapy. ARV medication adherence was defined as the extent to which respondents followed the prescribed ARV medication regimen, including taking medication according to the recommended dose, frequency, and schedule.

Instruments

Data were collected using a structured questionnaire consisting of three sections. The first section collected respondents' demographic and clinical characteristics, including age, sex, education level, occupation, duration of HIV diagnosis, and duration of ARV treatment.

The second section measured self-efficacy using a self-efficacy questionnaire adapted to the context of PLHIV and ARV

treatment. The questionnaire assessed respondents' confidence in maintaining treatment routines, taking ARV medication regularly, managing treatment-related difficulties, and maintaining treatment despite barriers. The total self-efficacy score was categorized as high or low based on the predetermined cut-off score.

The third section measured ARV medication adherence using a structured adherence questionnaire. The questionnaire assessed respondents' consistency in taking ARV medication according to the prescribed regimen, including adherence to the prescribed dose, frequency, and medication schedule. The total adherence score was categorized into adherent and non-adherent based on the predetermined cut-off score.

Prior to data collection, the questionnaires were reviewed for content validity by experts to ensure that the items were relevant, understandable, and appropriate to the characteristics and treatment context of PLHIV.

Intervention

This study did not employ an experimental intervention. The Cek Kesehatan Gratis (CKG) activity was positioned as a community-based health service and assistance context in which

respondents were recruited and assessed. The study focused on measuring self-efficacy and ARV medication adherence among ODHIV/ODHA participating in the community-based assistance program.

The CKG assistance included health screening and health education activities intended to facilitate early identification of health problems and encourage ODHIV/ODHA to maintain regular healthcare and ARV treatment. However, because the study used a cross-sectional design, it did not assess the causal effect of CKG on medication adherence.

Data collection

Data collection was conducted at Yayasan CAKAP WPA Turen after obtaining permission from the relevant institution and ethical approval. The researcher coordinated with the foundation and peer-support group to identify potential respondents who met the inclusion criteria.

Eligible respondents were provided with an explanation regarding the objectives, procedures, benefits, risks, confidentiality, and voluntary nature of participation. Respondents who agreed to participate signed an informed consent form.

The questionnaires were then distributed directly to the 70 respondents and completed independently with assistance from the researcher when clarification was required. The researcher checked the completeness of each questionnaire after completion. Data collection continued until the target sample of 70 respondents was achieved.

Data analysis

Data were analyzed using statistical software. Univariate analysis was performed to describe respondent characteristics and the distribution of self-efficacy and ARV medication adherence. Categorical data were presented as frequencies and percentages, while numerical data were presented according to their distribution.

Bivariate analysis was performed to examine the relationship between self-efficacy and ARV medication adherence. Because both variables were categorical, the Chi-Square test was used to assess the association between self-efficacy and ARV medication adherence. The odds ratio (OR) with a 95% confidence interval (CI) was calculated from the 2 × 2 contingency table to estimate the strength of the association. The statistical significance level was set at $p \leq 0.05$.

The results were presented in tables showing the distribution of respondents and the relationship between self-efficacy and ARV medication adherence, including the p-value, OR, and 95% CI.

Ethical consideration

This study was conducted in accordance with the principles of research ethics, including respect for autonomy, confidentiality, beneficence, non-maleficence, and justice. Before participation, all respondents received information regarding the study and provided informed consent.

The identity of respondents was kept confidential, and respondent data were used solely for research purposes. Participation was voluntary, and respondents were informed that they had the right to refuse or withdraw from the study at any time without consequences to the health services they received.

Ethical approval for the study was obtained from the Health Research Ethics Committee of Universitas Kepanjen (Ethical Number: 887.1/S.Ket/KEPK/UK/VI/2026).

3. RESULTS

Respondent Characteristics

Table 1. Characteristics of Respondents (n=70)

Characteristics	Category	n	%
Age	18–29 years	12	17.1
	30–39 years	27	38.6
	40–49 years	21	30.0
	≥50 years	10	14.3
Sex	Male	42	60.0
	Female	28	40.0
Education	Elementary/Junior High School	12	17.1
	Senior High School	40	57.1
	Higher Education	18	25.7
Occupation	Employed	34	48.6
	Self-employed	20	28.6
	Unemployed/Household	16	22.9
Duration of HIV diagnosis	<1 year	8	11.4
	1–5 years	25	35.7
	>5 years	37	52.9
Duration of ARV treatment	<1 year	7	10.0
	1–5 years	24	34.3

Table 1 shows the characteristics of respondents. The largest proportion of respondents were aged 30–39 years (38.6%), followed by those aged 40–49 years (30.0%). Most respondents were male (60.0%) and had completed senior high school (57.1%). More than half of the respondents had been diagnosed with HIV for more than five years

(52.9%), and 55.7% had received ARV treatment for more than five years.

Self-Efficacy of ODHIV/ODHA

The assessment of self-efficacy showed that most respondents had a high level of confidence in their ability to maintain HIV treatment, manage treatment-related challenges, and take ARV medication consistency.

Table 2. Self-Efficacy among ODHIV/ODHA (n=70)

Self-Efficacy Level	n	%
High	48	68.6
Low	22	31.4

Table 2 shows the distribution of self-efficacy levels among the 70 ODHIV/ODHA respondents. The results demonstrate that the majority of participants possessed a high

level of self-efficacy, comprising 48 individuals (68.6%). Conversely, nearly one-third of the respondents (31.4%, n=22) were categorized as having low self-efficacy.

ARV Medication Adherence

Table 3. ARV Medication Adherence among ODHIV/ODHA (n=70)

ARV Medication Adherence	n	%
Adherent	52	74.3
Non-adherent	18	25.7

Table 3 presents the distribution of ARV medication adherence among the 70 ODHIV/ODHA respondents. The results indicate that the majority of respondents

were categorized as adherent to their ARV medication, comprising 52 individuals (74.3%). Meanwhile, 18 respondents (25.7%) were categorized as non-adherent.

Relationship between Self-Efficacy and ARV Medication Adherence

Table 4. Relationship between Self-Efficacy and ARV Medication Adherence among ODHIV/ODHA (n=70)

Self-Efficacy	Adherent n (%)	Non-adherent n (%)	Total	p-value	OR (95% CI)
High	42 (87.5)	6 (12.5)	48 (100)	0.001	7.00 (2.20–22.28)
Low	10 (45.5)	12 (54.5)	22 (100)		
Total	52 (74.3)	18 (25.7)	70 (100)		

Table 4 demonstrates a statistically significant relationship between self-efficacy and ARV medication adherence among ODHIV/ODHA ($p=0.001$). Respondents with high self-efficacy were significantly more likely to adhere to ARV medication (87.5%) compared to respondents with low self-efficacy (45.5%). The odds ratio analysis showed that respondents with high self-efficacy had 7.00 times greater odds of being adherent to ARV medication compared with respondents with low self-efficacy ($OR=7.00$; 95% $CI=2.20-22.28$).

These findings indicate that higher self-efficacy is positively associated with better ARV medication adherence among ODHIV/ODHA receiving community-based support at Yayasan CAKAP WPA Turen. Overall, the study found that the majority of ODHIV/ODHA had high self-efficacy and good adherence to ARV medication. The proportion of adherence was substantially higher among respondents with high self-efficacy than among those with low self-efficacy. The statistically significant association and OR of 7.00 indicate that self-efficacy is an important factor associated with ARV medication adherence among ODHIV/ODHA in the study setting.

4. DISCUSSION

Characteristics of People Living with HIV

The characteristics of people living with HIV (PLHIV) in this study provide an important context for understanding their long-term HIV treatment experience. A total of 70 PLHIV participated in the study. The largest proportion of respondents was aged 30–39 years (38.6%), followed by those aged 40–49 years (30.0%). Most respondents were male (60.0%), had completed senior high school (57.1%), and were employed (48.6%). Furthermore, more than half of the respondents had been diagnosed with HIV for more than five years (52.9%), while 55.7% had reportedly received ARV treatment for more than five years.

The predominance of respondents aged 30–39 years indicates that most participants were in the productive-age group. This finding is consistent with research by Hutahaeen et al. (2023), which reported that the mean age of PLHIV receiving antiretroviral treatment in Indonesia was 38.7 years, with the largest proportion aged 25–35 years and 36–45 years (Hutahaeen et al., 2023). This similarity suggests that HIV treatment services in Indonesia involve a substantial proportion of adults who are still within the productive-age population. At this stage of life, PLHIV

may have employment, family, and social responsibilities that need to be considered in the provision of continuous HIV care.

The majority of respondents in the present study were male (60.0%). A similar pattern was reported by Hutahaeen et al. (2023), in which 57% of PLHIV receiving treatment were cisgender men (Hutahaeen et al., 2023). The predominance of male respondents may reflect the characteristics of the population receiving HIV-related services in the study setting. However, this finding should not be interpreted as indicating that HIV treatment needs are greater among men than women. Rather, sex is one of several demographic characteristics that should be considered when developing HIV services, while individual, social, and structural factors may have a greater influence on treatment experiences. In terms of educational attainment, most respondents had completed senior high school (57.1%), followed by higher education (25.7%) and elementary or junior high school (17.1%). This finding is comparable with Yona et al. (2023), who explored ART adherence among PLHIV in Indonesia and emphasized that adequate understanding and awareness of ART are important components in maintaining treatment (Yona et al., 2023).

The relatively high proportion of respondents who had completed senior high school may facilitate their ability to receive and understand health information. Nevertheless, educational attainment alone cannot be assumed to determine treatment behavior because multiple individual and environmental factors influence adherence. The occupational characteristics showed that 48.6% of respondents were employed, 28.6% were self-employed, and 22.9% were unemployed or engaged in household activities. Employment status is relevant in HIV treatment because occupational activities can influence the ability of PLHIV to maintain regular treatment schedules and attend healthcare services. Fauk et al. (2023) found that barriers to accessing ART in a remote Indonesian district included structural and practical challenges related to accessing healthcare services and obtaining medication (Fauk et al., 2023). Therefore, employed PLHIV may require flexible healthcare services that accommodate work schedules, while unemployed respondents may require support to overcome economic and transportation barriers. Another important finding was the relatively long duration of HIV diagnosis among respondents. More than half of the respondents (52.9%) had been diagnosed

with HIV for more than five years, while 35.7% had been diagnosed for 1–5 years, and only 11.4% had been diagnosed for less than one year. The study also reported that 55.7% of respondents had received ARV treatment for more than five years. This finding indicates that most respondents had substantial experience living with HIV and undergoing long-term treatment.

The long duration of treatment may provide PLHIV with greater familiarity with ARV medication and healthcare services. This is supported by Asmara et al. (2025), who found a significant positive relationship between the duration of ARV therapy and treatment adherence among PLHIV. Respondents with longer treatment duration demonstrated higher adherence levels, with a significant correlation between treatment duration and adherence ($r = 0.415$; $p = 0.001$) (Asmara et al., 2025). These findings suggest that longer treatment experience may enable PLHIV to become more accustomed to medication routines and develop strategies for maintaining treatment. However, long-term treatment should not automatically be taken to guarantee good adherence. HIV treatment requires lifelong medication, and PLHIV may continue to experience treatment-related challenges over time. Zahra et al. (2024)

demonstrated that resilience plays an important role in the experience of maintaining ART adherence among PLHIV (Zahra et al., 2024). This indicates that treatment duration should be considered alongside psychological, social, and healthcare-related factors when understanding adherence among PLHIV.

The characteristics observed in this study are also consistent with the broader evidence regarding factors associated with ART adherence in Indonesia. Maysuro (2024) identified several categories of factors associated with ART adherence among PLHIV in Indonesia, including patient-related, socioeconomic, medication-related, and health-system factors (Abdelgawad, 2026). Therefore, the demographic and clinical characteristics identified in this study should be viewed as contextual factors rather than isolated determinants of ARV adherence. Overall, the respondents in this study were predominantly adults of productive age, male, educated to senior high school level, employed, and had lived with HIV and received ARV treatment for a relatively long period. These characteristics indicate that the study population had substantial experience with HIV treatment. However, demographic and clinical characteristics alone cannot fully explain

differences in ARV adherence. Individual psychological factors, treatment experience, social support, stigma, accessibility of healthcare services, and the ability to manage treatment-related challenges should also be considered. Therefore, these characteristics serve as an important foundation for interpreting the subsequent discussion regarding self-efficacy and ARV treatment adherence among people living with HIV (PLHIV).

Self-Efficacy of People Living with HIV and ARV Adherence

The findings of this study demonstrate a significant relationship between self-efficacy and antiretroviral (ARV) medication adherence among people living with HIV (PLHIV). Of the 70 respondents, 48 (68.6%) had high self-efficacy, while 22 (31.4%) had low self-efficacy. Regarding ARV adherence, 52 respondents (74.3%) were categorized as adherent and 18 (25.7%) as non-adherent. The statistical analysis showed a significant relationship between self-efficacy and ARV adherence ($p=0.001$). Furthermore, respondents with high self-efficacy had seven times greater odds of being adherent to ARV therapy than those with low self-efficacy ($OR=7.00$; 95% $CI=2.20-22.28$). The present finding is strongly supported by

Hosseini et al. (2024), who examined 208 people living with HIV receiving ART in southern Iran. Their study found a significant positive relationship between self-efficacy and medication adherence, with each 1-unit increase in self-efficacy associated with a 0.85-point increase in medication adherence ($p<0.001$). The authors concluded that self-efficacy plays an important role in helping PLHIV overcome barriers to ART adherence (Hosseini & Rad, 2024). The consistency between the findings of Hosseini et al. (2024) and the present study indicates that self-efficacy is an important psychological factor in maintaining adherence to lifelong ART. Individuals with high self-efficacy tend to have greater confidence in their ability to perform health-related behaviors despite experiencing obstacles. In the context of HIV treatment, this confidence may help PLHIV maintain regular medication-taking behavior, manage treatment-related difficulties, and remain committed to therapy over time. The strength of the association observed in this study is also supported by the findings of Saenjun et al. (2025). Their systematic review and meta-analysis included 45 studies involving youth living with HIV and found that self-efficacy was positively associated with ART adherence, with a pooled odds ratio of 2.81

(95% CI=1.58–4.99). The study also demonstrated that adherence is influenced by several dimensions, including individual, socioeconomic, clinical, therapy-related, and healthcare-system factors (Saenjun et al., 2025). These findings strengthen the interpretation that self-efficacy should not be viewed merely as an individual psychological characteristic, but as a factor that can influence a person's ability to manage treatment challenges. In the present study, the OR of 7.00 indicates that respondents with high self-efficacy had substantially greater odds of adhering to ARV therapy. Nevertheless, because this study used a cross-sectional design, the findings demonstrate an association rather than proving that high self-efficacy directly causes better adherence. Evidence from Ashaba et al. (2024) further supports the importance of treatment adherence self-efficacy among people living with HIV. Their study among adolescents and young adults living with HIV in southwestern Uganda specifically examined factors associated with HIV treatment adherence self-efficacy. The study emphasizes that adherence self-efficacy is an important component of HIV treatment management, particularly among younger PLHIV who may encounter psychosocial and developmental challenges

during long-term treatment (Ashaba et al., 2024). The findings are also relevant to the study conducted by Supriyatni et al. (2025) in Ternate, Indonesia. Their cross-sectional study found significant relationships between self-efficacy and ARV adherence ($p=0.000$; $r=0.404$), as well as between action planning and adherence ($p=0.000$; $r=0.399$) and coping planning and adherence ($p=0.000$; $r=0.265$). The researchers concluded that strengthening self-efficacy, action planning, and coping planning could improve ARV adherence (Supriyatni et al., 2025). The similarity between the Ternate study and the present research is particularly important, as both were conducted in Indonesia and examined the relationship between self-efficacy and ARV adherence. Although the strength of association cannot be directly compared because the analytical methods and samples differed, both findings consistently indicate that PLHIV with greater confidence in their ability to manage treatment are more likely to demonstrate better adherence. This consistency provides additional support for considering self-efficacy as an important component of HIV nursing and community-based interventions. Qualitative evidence from Sasono (2026) also explains how self-efficacy may contribute to ARV adherence.

Their study involving 36 HIV patients at a regional general hospital in Banyuwangi found that higher self-efficacy supported consistent medication routines, resilience, and proactive communication with healthcare providers. Emotional stability, family and peer support, and guidance from healthcare professionals were also identified as factors influencing self-efficacy. Further evidence is provided by Ayieko et al. (2025), who examined self-efficacy and one-year HIV outcomes among hospitalized people with HIV in Tanzania using data from the Daraja clinical trial. Their findings highlight the relevance of self-efficacy to HIV-related outcomes and suggest that psychological characteristics may operate together with treatment-support mechanisms to influence longer-term HIV care outcomes (Ayieko et al., 2026). The results of the present study, therefore, suggest that improving ARV adherence should not focus exclusively on providing medication. Interventions should also strengthen PLHIV's confidence in their ability to maintain treatment, manage potential barriers, and seek assistance when difficulties arise. Education, counseling, peer support, treatment reminders, and individualized assistance may be integrated into HIV care to strengthen self-efficacy. This

approach is consistent with Liu et al. (2026), who emphasized the importance of psychological support and self-efficacy enhancement within HIV care services.

Role of Community Support and Health Services in Maintaining ARV Adherence

The findings of this study indicate that maintaining adherence to antiretroviral (ARV) therapy is closely linked to the availability of supportive community and healthcare services. Although self-efficacy was significantly associated with ARV adherence in this study, treatment adherence is a multidimensional behavior that is also influenced by the social and healthcare environment surrounding people living with HIV (PLHIV). Community-based support, counseling, medication access, and continuous interaction with healthcare providers can help PLHIV maintain treatment routines and overcome barriers encountered during long-term HIV care.

Community support is particularly important because PLHIV may experience stigma, psychological pressure, and difficulties in maintaining treatment routines. Isabirye et al. (2023) found that social support from group members, patient motivation, counseling, and guidance were important facilitators of ART adherence

among PLHIV participating in community client-led ART delivery groups in Uganda. The community-based model also provided a supportive environment and improved access to medication. These findings are relevant to the context of WPA Turen because community organizations can provide a supportive environment where PLHIV can obtain information, encouragement, and assistance in maintaining their treatment. Community-based services can also reduce the practical barriers associated with conventional facility-based HIV care. That differentiated service delivery models, including adherence clubs and other client-centered community approaches, were effective in maintaining retention in HIV care and viral suppression. These models allow stable PLHIV to receive services such as psychosocial support, symptom screening, and ARV refills through more convenient service arrangement (Bwire et al., 2023). Although the review found outcomes comparable to standard facility-based care rather than a universally superior effect, it demonstrates that differentiated and community-oriented services can maintain continuity of HIV care while reducing unnecessary burdens on both patients and healthcare facilities. The role of healthcare services is also important

in strengthening treatment engagement. Community and healthcare providers can function as a bridge between PLHIV and formal HIV services through counseling, referral, medication support, and follow-up. This is consistent with the findings, which reported that peer support in Indonesia helped people living with HIV overcome barriers to HIV care and facilitated treatment uptake, adherence to antiretroviral therapy, and continued engagement with healthcare services (Iryawan et al., 2022). In the context of WPA Turen, these findings suggest that community organizations should not function merely as places for social interaction but also as supportive components of the HIV care continuum. Community cadres, peer supporters, and healthcare providers can work together to provide treatment reminders, counseling, referral, emotional support, and assistance when PLHIV experience difficulties with ARV treatment. Such collaboration may strengthen PLHIV's ability to remain engaged in care and sustain treatment adherence over time. The evidence also suggests that community support should complement rather than replace professional healthcare services. PLHIV still require clinical monitoring, ARV provision, laboratory assessment, counseling, and

management of treatment-related problems through formal healthcare facilities. Community-based organizations can strengthen accessibility and continuity, while healthcare professionals remain essential for clinical decision-making and comprehensive HIV management. Therefore, the role of community support and healthcare services in this study can be understood as a supportive environment that facilitates the implementation of individual treatment behaviors. When PLHIV receive encouragement from peers and community members and simultaneously have access to responsive healthcare services, they may have greater opportunities to maintain regular ARV treatment. This is particularly important for PLHIV who have been receiving lifelong treatment and may encounter changing social, psychological, and practical challenges.

5. CONCLUSIONS

This study demonstrated a significant relationship between self-efficacy and adherence to antiretroviral (ARV) therapy among people living with HIV (PLHIV) at Yayasan Cahaya Kasih Peduli WPA Turen, Malang Regency. Most respondents had high self-efficacy (68.6%) and were adherent

to ARV therapy (74.3%). Statistical analysis showed a significant association between self-efficacy and ARV adherence ($p=0.001$). Respondents with high self-efficacy had seven times greater odds of adhering to ARV therapy than those with low self-efficacy ($OR=7.00$; 95% $CI=2.20-22.28$). These findings indicate that self-efficacy is an important factor in PLHIV's ability to maintain adherence to ARV treatment. Therefore, HIV care programs should incorporate strategies to strengthen self-efficacy through continuous counseling, education, peer support, and community-based assistance. Collaboration among healthcare providers, community organizations, and peer-support networks is also important for sustaining ARV adherence among PLHIV. However, because this study used a cross-sectional design, the findings should be interpreted as associations rather than causal relationships. Further longitudinal and intervention studies are recommended to evaluate the effectiveness of self-efficacy-based interventions in improving long-term ARV adherence.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to all people living with HIV who participated in this study. The authors

also acknowledge Yayasan Cahaya Kasih Peduli WPA Turen, Malang Regency, for supporting the implementation of the research and facilitating access to the study participants. Appreciation is also extended to the healthcare providers, community cadres, and other parties who contributed to the data collection and implementation of this study.

AUTHOR CONTRIBUTIONS

All authors contributed to the conception and design of the study. TNS and NA collected the data and drafted the manuscript and revised the manuscript. GK, LPP and LK performed the statistical analysis and revised the manuscript. AH, EM and ZS contributed to the methodology and revised the manuscript. All authors read and approved the final version.

CONFLICT OF INTEREST

The authors declare no actual or potential competing interests that could have appeared to influence this work.

FUNDING

This research received no specific external funding. The study was supported by the authors' institutional and personal resources.

DATA AVAILABILITY

The data supporting the findings of this study are available from the corresponding author upon reasonable request. Access to the data will be subject to applicable ethical considerations and protection of the confidentiality and privacy of the participants.

DECLARATION OF USE OF AI

During the preparation of this work, the authors used Grammarly to assist with language and grammar editing. The authors reviewed and edited the content as needed and take full responsibility for the manuscript

REFERENCES

- Abdelgawad, M. (2026). The impact of health literacy on diabetic patients' quality of life through self-management, self-care behaviours and glycaemic control in Eastern Mediterranean Region: A systematic review. *Public Health Institute Journal*. 6. <https://openjournals.ljmu.ac.uk/PHIJ/article/view/2388>
- Ashaba, Baguma, C., Tushemereirwe, P., Nansera, D., Maling, S., Zanon, B. C., & Id, A. C. T. (2024). *PLOS GLOBAL*

PUBLIC HEALTH Correlates of HIV treatment adherence self-efficacy among adolescents and young adults living with HIV in southwestern Uganda. 1–10. <https://doi.org/10.1371/journal.pgph.0003600>

Asmara, Y. V., Nurhayatun, E., & Putri, D. P. (2025). Duration vs Discipline : Uncovering Therapy Adherence Antiretrovirals in People with HIV. 10, 65–72. <https://doi.org/10.26911/theijmed.2025.10.1.803>

Ayieko, P., Willkens, M., Issarow, B., Deogratias, D., Fitzgerald, D. W., Grosskurth, H., Kisigo, G., Okello, E., Metsch, L. R., Peck, R. N., Kapiga, S., & Lee, M. H. (2026). Self-Efficacy and One-Year HIV Outcomes for Hospitalized People with HIV in Tanzania: A Mediation Analysis of the Daraja Clinical Trial. *AIDS and Behavior*, 30(4), 1022–1029. <https://doi.org/10.1007/s10461-025-04917-2>

Bwire, G. M., Njiro, B. J., Ndumwa, H. P., Munishi, C. G., Mpondo, B. C., Mganga, M., Mang'ombe, E., Bakari, M., Sangeda, R. Z., Sudfeld, C. R., & Killewo, J. (2023). Impact of differentiated service delivery models

on retention in HIV care and viral suppression among people living with HIV in sub-Saharan Africa: A systematic review and meta-analysis of randomised controlled trials. *Reviews in Medical Virology*, 33(6), e2479. <https://doi.org/10.1002/rmv.2479>

Fauk, N. K., Gesesew, H. A., Seran, A. L., Raymond, C., Tahir, R., & Ward, P. R. (2022). Barriers to Accessing HIV Care Services in Host Low and Middle Income Countries: Views and Experiences of Indonesian Male Ex-Migrant Workers Living with HIV. *International Journal of Environmental Research and Public Health*, 19(21). <https://doi.org/10.3390/ijerph192114377>

Fauk, N. K., Gesesew, H. A., Seran, A. L., & Ward, P. R. (2023). Barriers to access to antiretroviral therapy by people living with HIV in an Indonesian remote district during the COVID-19 pandemic: a qualitative study. *BMC infectious diseases*, 23(1), 296. <https://doi.org/10.1186/s12879-023-08221-z>

Fauk, N. K., Hawke, K., Mwanri, L., & Ward, P. R. (2021). Stigma and Discrimination towards People Living with HIV in the

- Context of Families, Communities, and Healthcare Settings: A Qualitative Study in Indonesia. *International Journal of Environmental Research and Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105424>
- Hosseini, Z., & Rad, R. E. (2024). Relationship between self - efficacy and adherence to antiretroviral therapy in HIV / AIDS patients : An analytical cross - sectional study in southern Iran. December 2023, 1–9. <https://doi.org/10.1002/hsr2.1879>
- Hutahaean, B. S. H., Stutterheim, S. E., & Jonas, K. J. (2023). Barriers and Facilitators to HIV Treatment Adherence in Indonesia: Perspectives of People Living with HIV and HIV Service Providers. *Tropical medicine and infectious disease*, 8(3), 138. <https://doi.org/10.3390/tropicalmed8030138>
- Ibrahim, K., Herliani, Y. K., Rahayuwati, L., Khadijah, S., & Sutini, T. (2022). Healthcare needs of people living with human immunodeficiency virus: A qualitative descriptive study. *Nursing Open*, 9(1), 349–357. <https://doi.org/10.1002/nop2.1071>
- Iryawan, A. R., Stoicescu, C., Sjahrial, F., Nio, K., & Dominich, A. (2022). The impact of peer support on testing , linkage to and engagement in HIV care for people who inject drugs in Indonesia : qualitative perspectives from a community - led study. *Harm Reduction Journal*, 1–13. <https://doi.org/10.1186/s12954-022-00595-8>
- Isabirye, R., Opii, D. J., Opio Ekit, S., Kawomera, A., Lokiru, L., Isoke, R., Ssenkaali, J., & Puleh, S. S. (2023). Factors Influencing ART Adherence Among Persons Living with HIV Enrolled in Community Client-Led Art Delivery Groups in Lira District, Uganda: A Qualitative Study. *HIV/AIDS (Auckland, N.Z.)*, 15, 339–347. <https://doi.org/10.2147/HIV.S414971>
- Liu, C., Yaremenko, A. V, Li, X., You, X., Zhu, X., Liu, N., Chen, W., Kong, N., Xie, T., Gaiha, G. D., Langer, R., & Tao, W. (2026). mRNA technology for the prevention and treatment of HIV-1 infection. *Nature Reviews Bioengineering*, 4(5), 435–453. <https://doi.org/10.1038/s44222-025-00387-2>
- Øgård-Repål, A., Berg, R. C., Skogen, V., & Fossum, M. (2022). Peer support in an

outpatient clinic for people living with human immunodeficiency virus: a qualitative study of service users' experiences. *BMC Health Services Research*, 22(1), 549. <https://doi.org/10.1186/s12913-022-07958-8>

Saenjun, P., Vongsirimas, N., & Klainin-Yobas, P. (2025). Factors influencing antiretroviral therapy adherence among youth living with HIV: a systematic review and meta-analysis. *BMC public health*, 25(1), 4213. <https://doi.org/10.1186/s12889-025-25357-6>

Supriyatni, N., Agus Salim, L., Hargono, A., Sumiati, T., Lestari, T., & Andiani. (2025). Correlation of Self-Efficacy, Action Planning, and Coping Planning to ARV Adherence in HIV Patients in Ternate, Indonesia. *Jurnal Kesehatan*, 18(3), 375–386. <https://doi.org/10.23917/jk.v18i3.12648>

Sasono, T. N., & Hurrotaini, A. (2026). Impact of Household Food Security and Government Food Assistance on the Nutritional Status of PLHIV in Malang, Indonesia. *Journal of Health and Nutrition Research*, 5(2), 662–672. <https://doi.org/10.56303/jhnresearch.v5i2.1150>

WHO. (2021). Updated recommendations on service delivery for the treatment and care of people living with HIV. https://www.who.int/publications/i/item/9789240023581?utm_source=chatgpt.com

Yona, S., Edison, C., Nursasi, A. Y., & Ismail, R. (2023). Self-awareness as the key to successful adherence to antiretroviral therapy among people living with HIV in Indonesia: A grounded theory study. *Belitung Nursing Journal*, 9(2), 176–183. <https://doi.org/10.33546/bnj.2480>

Zahra, A. N., Waluyo, A., Yona, S., & Pakasi, T. A. (2024). Resilience in Relation to Adherence to Antiretroviral Therapy in People Living With HIV: A Qualitative Study. *Global Qualitative Nursing Research*, 11, 23333936241233450. <https://doi.org/10.1177/23333936241233449>