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## Differences in ART Adherence Before and After a Hypnotherapy Intervention Among PLHIV in Urban Primary Health Care Facilities in Jambi City

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### Abstract

**Background:** In metropolitan areas, HIV/AIDS continues to be a significant public health concern. Despite the widespread availability of antiretroviral medication (ART) in primary healthcare institutions, long-term treatment success still depends on continued drug adherence and patient retention. ART adherence among people living with HIV (PLHIV) may be adversely affected by psychological factors such as anxiety, internalized stigma, low motivation, and decreased self-efficacy.

**Aims:** The purpose of this study was to investigate how hypnotherapy affected ART adherence in HIV-positive individuals getting treatment at urban primary healthcare institutions in Jambi City.

**Methods:** A pre-experimental study with a one-group pretest-posttest design was conducted. Thirty PLHIV receiving antiretroviral therapy (ART) at the Aur Duri, Kenali Besar, and Rawasari Public Health Centers in Jambi City were recruited using purposive sampling. These health centers were selected because they provide active ART services and HIV counseling. ART adherence was measured before and after the hypnotherapy intervention using the Simplified Medication Adherence Questionnaire (SMAQ). Data were analyzed using the Wilcoxon signed-rank test.

**Result:** Before and after the intervention, the mean ART adherence score was  $4.27 \pm 2.08$  and  $5.40 \pm 1.04$ , respectively. There were 15 participants (50.0%) who exhibited improved adherence, 15 participants (50.0%) who showed no change, and no participants who showed a decrease in adherence. ART adherence before and after the hypnotherapy intervention differed statistically significantly, according to the Wilcoxon signed-rank test ( $Z = -3.469$ ;  $p = 0.001$ ).

**Conclusion:** Antiretroviral medication (ART) adherence among HIV-positive individuals in urban primary healthcare settings was considerably enhanced by hypnotherapy. These results imply that hypnotherapy could be used as an additional community nursing intervention to promote long-term adherence to ART.

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## INTRODUCTION

In Indonesia, HIV/AIDS is still a major public health concern. Living with HIV is no longer seen as an acute, fatal illness but rather as a chronic, long-term condition. The emphasis of HIV care has shifted from survival to maintaining long-term adherence, quality of life, mental health, and sustained involvement in care as life expectancy increases due to widespread availability to antiretroviral medication. In addition to pharmacological treatment, this strategy requires comprehensive therapies that address behavioral and psychosocial determinants of adherence.

Antiretroviral therapy (ART) long-term adherence is influenced by a variety of psychosocial, behavioral, and structural factors in addition to pharmaceutical accessibility. HIV-related stigma,

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depression, anxiety, lack of social support, treatment exhaustion, substance abuse, and low self-efficacy have all been identified as important indicators of non-adherence among HIV-positive individuals. Strong patient-provider relationships, family support, successful counseling, and behavioral treatments, on the other hand, are crucial for attaining viral suppression and encouraging long-term treatment adherence. When behavioral interventions focus on motivation, self-regulation, and patient engagement, they continue to be among the most successful methods for enhancing medication adherence across chronic diseases (Langebeek et al., 2014; Bezabhe et al., 2016; Langebeek et al., 2014; Mills et al., 2006; Ortego et al., 2011).

Inadequate adherence to antiretroviral medication (ART) and departure from HIV medical services are still mostly caused by HIV-associated stigma. According to recent research, stigma negatively affects long-term care engagement and medication adherence for people living with HIV (PLHIV) (Nawfal et al., 2024; van der Kooij et al., 2023).

particularly in metropolitan areas where long-term treatment success is not always correlated with service accessibility. Despite the widespread availability of antiretroviral medication (ART) in basic healthcare settings, adherence and retention continue to be major obstacles. Achieving the worldwide 95-95-95 target involves not just availability to medication but also continuous patient involvement, adherence behavior, and psychosocial support (Joint United Nations Programme on HIV/AIDS (UNAIDS), 2024; World Health Organization, 2021).

Adherence to antiretroviral therapy (ART) is a complex health behavior that is influenced by knowledge, perceived advantages, perceived hurdles, motivation, self-efficacy, stigma, family support, and the quality of the therapeutic relationship. According to the Health Belief Model (HBM), treatment adherence is improved when people believe they can overcome potential obstacles, acknowledge the advantages of antiretroviral therapy (ART), and view HIV as a serious health problem. While Self-Efficacy Theory emphasizes people's confidence in their ability to maintain long-term medication adherence, Theory of Planned Behavior (TPB) emphasizes the impact of attitudes, subjective norms, and perceived behavioral control on adherence intentions (Ajzen, 1991; B. Nachega et al., 2011; Bandura, 1997; Rosenstock et al., 1988).

Further understanding of how long-term drug adherence is maintained after the initial establishment of behavioral intentions is offered by more recent behavioral theories. While the Health Action Process Approach emphasizes the functions of self-regulation, action planning, and coping planning as crucial processes that bridge the gap between intention and actual behavior, Self-Determination Theory emphasizes the significance of intrinsic motivation in sustaining health-related behaviors over time. Additionally, capability, opportunity, and motivation are identified by the Behavior Change Wheel as essential elements that support long-term behavioral change. By elucidating how consistent medication-taking behavior becomes ingrained in daily routines and is sustained over time, these modern theoretical frameworks collectively broaden the perspectives provided by the Health Belief Model and the Theory of Planned Behavior (Michie et al., 2011; Ryan & Deci, 2019).

One of the biggest obstacles to long-term adherence to antiretroviral medication (ART) is still HIV-related stigma, which leads to treatment avoidance, delayed revelation of HIV status, social isolation, and decreased use of medical services. Higher levels of internalized stigma have been linked to lower levels of ART adherence, worse treatment engagement, and the development of depressive symptoms, according to recent research. Therefore, by increasing treatment engagement and fostering emotional well-being, psychological therapies that lessen negative self-perceptions and boost self-worth may indirectly improve ART adherence (Earnshaw et al., 2013; Katz et al., 2013; van der Kooij et al., 2023).

The present findings are consistent with prior systematic reviews suggesting that psychosocial treatments promote adherence to antiretroviral therapy (ART) by addressing the emotional and behavioral factors of treatment adherence rather than relying simply on medication education. When compared to education-only interventions, multicomponent interventions that incorporate motivational interviewing, cognitive behavioral therapy, peer support, adherence counseling, and digital follow-up have been demonstrated to produce greater improvements in medication adherence and viral suppression (Che Pa et al., 2023; Costa-Cordella et al., 2022; Xiao & Han, 2023).

Sustained medication adherence also depends on the formation of habitual behaviors and efficient self-regulation, even though these theories explain how behavioral intentions are converted into action. According to the Habit Formation Theory, taking medication on a regular basis in stable situations eventually turns into an automatic behavior, which lessens reliance on conscious motivation and promotes long-term adherence (Robinson et al., 2024). In a similar vein, self-regulation allows people to keep an eye on their behavior, get past obstacles, and sustain treatment-related objectives over time. Self-regulatory ability, habit strength, and behavioral prepotency are consistently linked to better drug adherence across populations with chronic illnesses, according to a recent meta-analysis (Liddelow et al., 2023). These mechanisms further supplement the Behaviour Change Wheel by explaining how capability, opportunity, and motivation can be translated into persistent medication adherence.

In addition to these behavioral mechanisms, self-regulation and habit development offer a conceptual foundation for psychological therapies intended to enhance long-term drug adherence. Individuals may be able to assist the development of the development of the development of daily self-regulatory self-regulatory self-regulation. These behavioral processes are especially important for interventions like hypnotherapy, which support sustained adherence after treatment intentions are formed by strengthening motivation, cognitive restructuring, and adaptive self-management (Liddelow et al., 2023; Robinson et al., 2024).

HIV is still a major public health issue in Jambi City. By the end of 2024, there were about 1,400 persons living with HIV (PLHIV), according to the Jambi City Health Office (Jambi City Health Office, 2024). Furthermore, preliminary program data from a subset of primary healthcare institutions showed that 17.6% of patients had treatment interruption or were lost to follow-up, and adherence to antiretroviral therapy (ART) remained inadequate, with an adherence rate of 61.8%. Despite the availability of ART therapies, our findings demonstrate persistent difficulties in sustaining long-term engagement in HIV care.

Focused attention, relaxation, and positive suggestion are employed in hypnotherapy, a supplementary psychological intervention, to affect emotional and cognitive reactions. Hypnotherapy may lessen stress-related reactions and improve receptivity to behavioral modification from a neuropsychological standpoint. According to the Health Belief Model (HBM), hypnotherapy may improve the perceived advantages of antiretroviral therapy (ART) while lowering perceived barriers like stigma, treatment tiredness, and fear of side effects. According to the Theory of Planned Behavior (TPB), hypnotherapy may strengthen perceived behavioral control, improve attitudes toward treatment, and boost self-efficacy by boosting people's confidence in continuing to take their medications as prescribed. Hypnotherapy may support emotional control, cognitive restructuring, and long-term treatment compliance through these interconnected mechanisms (Ajzen, 1991; Bandura, 1997; Elkins et al., 2015).

Hypnosis and hypnotherapy may lessen psychological distress, enhance anxiety, pain perception, sleep quality, emotional regulation, and promote positive behavioral change in a variety of chronic conditions, according to earlier research. Behavioral medicine research indicates that hypnosis may improve motivation and cognitive restructuring by increasing responsiveness to therapeutic suggestions, which may indirectly support treatment adherence, despite the paucity of evidence among PLHIV (Elkins et al., 2015; Hammond, 2010; Šuser et al., 2016).

Clinical research also suggests that hypnosis may improve symptom management and facilitate behavioral change across various chronic medical conditions (Jensen et al., 2015). These findings indicate that hypnosis has broader therapeutic applications beyond symptom relief by supporting positive health-related behaviors. Although evidence among PLHIV remains limited, these potential mechanisms provide a rationale for investigating hypnotherapy as an adjunctive intervention to improve ART adherence (Jensen et al., 2015).

Antiretroviral medication (ART) adherence has been shown to improve with psychosocial interventions such as peer support programs, cognitive behavioral therapy and motivational interviewing. However, there is still little data on the use of hypnosis among HIV-positive individuals, especially in low- and middle-income nations. To the best of our knowledge, no prior research has assessed structured hypnotherapy as an additional nursing intervention in Indonesian primary healthcare settings. The need to look into whether hypnotherapy can be a useful

Supplemental intervention for enhancing ART adherence in primary healthcare is highlighted by this gap in the literature.

Therefore, the purpose of this study was to assess the impact of hypnotherapy on ART adherence among HIV-positive individuals getting treatment at urban primary healthcare facilities in Jambi City. It was predicted that after receiving the hypnotherapy intervention, individuals' adherence to ART would significantly improve.

## METHOD

This study assessed changes in antiretroviral medication (ART) adherence after a hypnotherapy intervention using a pre-experimental one-group pretest-posttest design. The study was carried out at three urban primary healthcare facilities in Jambi City Aur Duri, Kenali Besar, and Rawasari Health Centers between March and April of 2026. 57 individuals living with HIV (PLHIV) who were on active antiretroviral therapy (ART) made up the target population. This study was conducted at three urban primary health care facilities in Jambi City (Aur Duri, Kenali Besar, and Rawasari Public Health Centers) between March and April 2026.

The target population consisted of 57 people living with HIV (PLHIV) receiving antiretroviral therapy (ART). A total of 30 participants met the inclusion and exclusion criteria and were enrolled in the study. The inclusion criteria were adults aged 18 years or older, diagnosed with HIV, receiving ART for at least three months, able to communicate effectively, and willing to participate by providing written informed consent. Individuals with severe psychiatric disorders, hearing impairments that could interfere with the hypnotherapy session, or acute medical conditions requiring immediate treatment were excluded from the study.

The Simplified Medication Adherence Questionnaire (SMAQ), which has six items assessing medication-taking behavior over various time periods, treatment stoppage, and missed doses, was used to measure ART adherence. The Simplified Medication Adherence Questionnaire (SMAQ), which consists of six items assessing medication-taking behavior, treatment interruption, and missed doses, was used to measure ART adherence. The original SMAQ has demonstrated acceptable psychometric properties, with reliability coefficients ranging from 0.70 to 0.80 and adequate construct validity (Knobel et al., 2002). Although a formally validated Indonesian version of the SMAQ has not yet been reported, the questionnaire was translated into Indonesian to facilitate participants' understanding and was reviewed by the research team to ensure linguistic clarity before data collection. An observation checklist was also used to ensure procedural consistency throughout the intervention (Knobel et al., 2002).

A licensed hypnotherapist with professional experience in behavioral health intervention administered the hypnotherapy intervention one-on-one. A standardized hypnotherapy script was created and applied uniformly in each session to guarantee uniformity across the thirty participants. Standardized stages of preparation, induction, deep relaxation, therapeutic recommendations aimed at enhancing ART adherence, ego strengthening, and termination were all included in the script. Every session lasted between thirty and forty-five minutes and was held in a private, peaceful environment.

Two to four weeks following the hypnotherapy session, post-intervention adherence was assessed. The behavioral change theory, which contends that short-term cognitive and motivational improvements following suggestion-based therapies may take time to convert into stable medication-taking behavior, was the basis for choosing this follow-up period. In addition to allowing for initial behavioral consolidation, the 2–4 week interval offers a more accurate measure of sustained adherence change. The behavioral effects of single-session hypnotherapy, however, are known to gradually diminish over time, especially in the absence of reinforcement or repeated sessions (Bandura, 1997; Häuser et al., 2016).

Bivariate analysis was used to compare pretest and posttest results, while univariate analysis was used to characterize the adherence characteristics of the individuals. Because the data were paired and not normally distributed, the Wilcoxon signed-rank test was used, with a significance level of  $p < 0.05$ . To ascertain the extent of the intervention impact, the effect size ( $r = Z/\sqrt{N}$ ) was also computed. The Ministry of Health's Jambi Health Polytechnic Ethics Committee granted ethical

approval (No: LB.02.06/2/031.2/2026). Prior to their involvement in the study, each subject provided written informed consent.

## RESULTS AND DISCUSSION

### Results

Overview of Antiretroviral Therapy (ART) Adherence among PLHIV Before Receiving Hypnotherapy

This study involved 30 PLHIV receiving ART in three urban public health centers in Jambi City. Before hypnotherapy, adherence varied across the six SMAQ items. The lowest adherence appeared in item P1, where 17 participants (56.7%) were categorized as not adherent. After hypnotherapy, adherence improved across all items. On item P1, adherent responses increased to 27 participants (90.0%). Item P2 showed the highest adherence after the intervention, with 29 participants (96.7%) adherent.

**Table 1.** Average ART Compliance Among HIV-positive Individuals Prior to the Hypnotherapy Intervention

| No | Variabel              | N  | Mean | Median | Modus | SD    | Min | Max |
|----|-----------------------|----|------|--------|-------|-------|-----|-----|
| 1  | Pretest ART adherence | 30 | 4,27 | 5,00   | 6     | 2,083 | 0   | 6   |

Table 1. demonstrates that the average adherence score for ART among individuals with HIV prior to the hypnotherapy treatment stood at 4.27. The median score for adherence was 5.00, while the score that appeared most often (mode) was 6. A standard deviation of 2.083 suggests a moderate level of variation in ART adherence scores among those involved in the study.

Respondents' adherence levels varied prior to the intervention, as evidenced by the lowest adherence score of 0 and the highest score of 6. While many respondents had good adherence, several individuals had very poor adherence scores, which reduced the overall average, as indicated by the comparatively high median and mode when compared to the mean. Overall, these results show that ART adherence among HIV-positive individuals had not yet attained an ideal level prior to undergoing hypnotherapy, underscoring the necessity of interventions to enhance drug adherence.

Average ART Compliance Among HIV-positive Individuals Following the Hypnotherapy Intervention

After the intervention, respondents' ART adherence was measured again using the same adherence questionnaire. This posttest assessment was conducted to determine changes in ART adherence after respondents received hypnotherapy. The descriptive analysis of the posttest ART adherence scores is presented in Table 2.

**Table 2.** Summary of HIV-positive Individuals' Mean ART Adherence Following Hypnotherapy

| No | Variabel               | N  | Mean | Median | Modus | SD    | Min | Max |
|----|------------------------|----|------|--------|-------|-------|-----|-----|
| 1  | Posttest ART adherence | 30 | 5,40 | 6,00   | 6     | 1,037 | 3   | 6   |

Table 2. shows that following the hypnotherapy intervention, the mean ART adherence score among HIV-positive individuals was 5.40, with a median score of 6.00 and a mode of 6. When compared to the pre-intervention evaluation, the standard deviation of 1.037 shows comparatively low variability in post-intervention adherence scores, indicating higher consistency among participants.

After the intervention, the lowest ART adherence score was 3, while the highest score was 6. These results show that following the intervention, all participants attained moderate to high levels of ART adherence, with the majority achieving the highest adherence score. Overall, the results point to an improvement in ART adherence among HIV-positive individuals after the hypnotherapy

intervention. When compared to the pre-intervention, the mean adherence score was greater and the standard deviation was lower.

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#### Effect of Hypnotherapy on ART Adherence Among People Living with HIV

To ascertain if the data were regularly distributed, a normality test was carried out prior to hypothesis testing. Because there were fewer than 50 participants in the sample, the Shapiro-Wilk test was chosen. Table 4.3 displays the normalcy test results.

**Table 3.** Normality Test Results for Pre- and Post-Intervention ART Adherence

| Variable               | N  | Statistic (Shapiro-Wilk) | Sig. (p-value) |
|------------------------|----|--------------------------|----------------|
| Pretest ART Adherence  | 30 | 0.776                    | 0.000          |
| Posttest ART Adherence | 30 | 0.624                    | 0.000          |

The pre-intervention<sup>35</sup> and post-intervention ART adherence scores had a p-value of 0.000, as Table 3 demonstrates. The data were not normally distributed<sup>5</sup> since the p-value was less than 0.05. Therefore, the impact of the hypnotherapy intervention on ART adherence among individuals living with HIV was investigated using the Wilcoxon signed-rank test.

<sup>34</sup> The ART adherence scores before and after the hypnotherapy intervention were then compared using the Wilcoxon signed-rank test. Table 4. presents the findings.

**Table 4.** Shows the Wilcoxon Signed-Rank Test results on the impact of hypnotherapy on ART adherence in HIV-positive individuals<sup>6</sup>

| Variable                           | N  | Z      | p-value |
|------------------------------------|----|--------|---------|
| Pretest and Posttest ART Adherence | 30 | -3.469 | 0.001   |

<sup>5</sup> The Wilcoxon signed-rank test produced a Z value of -3.469 with a p-value of 0.001 based on Table 4. There was a statistically significant difference in ART adherence before and after the hypnotherapy session since the p-value was smaller than 0.05. As a result, the alternative hypothesis ( $H_1$ ) was accepted and the null hypothesis ( $H_0$ ) was rejected, suggesting that the findings indicate a statistically significant difference in ART adherence before and after the hypnotherapy intervention (p = 0.001). However, because approximately half of the participants showed no change in adherence, these results should be interpreted cautiously and do not necessarily indicate a clinically meaningful improvement for all participants, the Wilcoxon Signed Rank Test revealed that 15 participants (50.0%) showed enhanced ART adherence following the intervention (positive ranks), while the remaining 15 participants (50.0%) showed no change (ties). There was no decline in adherence among the subjects (negative ranks = 0). These results show that half of the individuals' ART adherence was enhanced by hypnosis.<sup>41</sup>

## Discussion<sup>74</sup>

Overview of HIV-positive Individuals' Adherence to Antiretroviral Therapy Prior to the Hypnotherapy Intervention

The current study discovered that prior to the hypnotherapy intervention, antiretroviral medication (ART) adherence among people living with HIV (PLHIV) had not yet achieved an ideal level. With a somewhat high standard deviation (SD = 2.083) and a mean pre-intervention adherence score of 4.27 out of a possible score of 6, there was significant variation in participants' adherence behavior. The minimum score of 0 indicates that some participants showed extremely low levels of adherence, which lowered the total mean score even though the median and mode were 5 and 6, respectively. These results show that even after patients have been taking ART for at least three months, problems with ART adherence are still prevalent.

One of the primary obstacles to effective HIV treatment is inadequate adherence to antiretroviral therapy (ART). Consistent adherence is essential to achieve viral suppression, prevent the development of drug resistance, and improve the overall health of people living with HIV. Consequently, interventions that promote and sustain ART adherence continue to be an important focus of HIV care.<sup>6</sup>

This study's diversity in adherence is in line with earlier research demonstrating that PLHIV often experience emotional distress, internalized stigma, fear of disclosure, treatment exhaustion, and forgetfulness all of which have a detrimental impact on medication adherence. Because emotional distress can lower desire, interfere with daily treatment routines, and decrease concentration, psychological issues including anxiety and depression have been repeatedly linked to worse ART adherence. As a result, treatments that target psychological factors are becoming more widely acknowledged as crucial elements of all-encompassing HIV therapy (Safren et al., 2009).

Differences in individuals' readiness to continue treatment for the rest of their lives are also reflected in the very high variability of adherence scores prior to intervention. According to Bandura's Social Cognitive Theory, self-efficacy, outcome expectations, and self-regulation all have a significant impact on health behavior. People who are more confident in

Overall, the pre-intervention results show that while many patients showed comparatively strong adherence to antiretroviral therapy (ART), a significant percentage still showed irregular medication-taking behavior. Before optimal long-term ART adherence can be attained, these baseline results highlight the necessity of supplementary psychological therapies that address the behavioral and emotional barriers to medication adherence (UNAIDS, 2024).

#### Antiretroviral Therapy Overview Adherence in HIV-positive Individuals Following Hypnotherapy

The present study found a statistically significant difference in ART adherence before and after the hypnotherapy intervention. The Wilcoxon signed-rank test yielded a Z value of -3.469 with a p-value of 0.001, indicating that ART adherence differed significantly following the intervention. However, the observed improvement was not consistent across all participants, as only half of the participants demonstrated improved adherence.

The mean post-intervention adherence score increased to 5.40 out of a maximum possible score of 6, while the standard deviation decreased to 1.037 compared with the pre-intervention value, indicating that participants' medication-taking behavior became more consistent after the intervention. Furthermore, the minimum adherence score increased from 0 before the intervention to 3 after hypnotherapy, suggesting that even participants who initially demonstrated poor adherence showed improvements in their medication-taking behavior. These findings indicate that hypnotherapy may contribute to improving both the level and consistency of ART adherence among people living with HIV (World Health Organization, 2021).

The observed improvement may be explained by the psychological mechanisms underlying hypnotherapy. During hypnosis, individuals enter a state of focused attention and heightened receptivity to therapeutic suggestions, allowing positive messages regarding medication adherence to be more readily internalized. These suggestions may strengthen motivation, reinforce positive beliefs toward lifelong ART, reduce treatment-related anxiety, and improve confidence in maintaining regular medication-taking behavior. Previous evidence has shown that hypnosis can positively influence health-related behaviors through cognitive and emotional modification rather than through direct pharmacological effects ((Elkins et al., 2015; Häuser et al., 2016).

Modern behavioral theory can also be used to analyze these results. According to the Self-Determination Theory, people are more likely to maintain healthy habits when they become self-motivated and believe they are capable of handling their care. Similarly, in order to translate behavioral intentions into consistent medication-taking behavior, the Health Action Process Approach highlights the significance of self-regulation, planning, and coping techniques. By boosting intrinsic motivation, promoting emotional regulation, and boosting confidence to stick to long-term ART, hypnotherapy may help these processes (Ryan & Deci, 2020); Schwarzer, 2008).

The improvement seen in this study is also in line with earlier research showing that psychosocial interventions, rather than only medication instruction, can increase ART adherence by addressing cognitive, emotional, and behavioral barriers. Behavioral counseling, cognitive behavioral therapy, motivational interviewing, and other psychological therapies increase adherence by boosting treatment engagement and reinforcing healthy behaviors, according to systematic studies. The current findings suggest hypnotherapy's potential as a supplemental behavioral intervention within HIV care, despite the paucity of evidence particularly testing it among PLHIV (Che Pa et al., 2023; Costa-Cordella et al., 2022; Xiao & Han, 2023).

Further research has shown that the relationship between psychological distress, perceived stigma, and self-regulatory ability has a significant impact on ART adherence. People who are more emotionally burdened and who have internalized stigma are more likely to have reduced involvement with HIV care and worse medication adherence. As a result, treatments that focus on cognitive restructuring and emotional control may help maintain improvements in adherence behavior. According to Aytenew et al. (2024) and van der Kooij et al. (2023), hypnotherapy can support regular adherence counseling in this situation by enhancing patients' internal coping strategies and lowering psychological obstacles to long-term treatment.

Overall, the post-intervention results indicate that by improving psychological preparedness, motivation, and commitment to lifelong antiretroviral medication (ART), hypnotherapy may be able to supplement standard adherence counseling. Considering that HIV therapy necessitates consistent commitment throughout

#### Hypnotherapy's Impact on Antiretroviral Therapy Adherence in HIV-positive Individuals

The present study demonstrated a statistically significant improvement in adherence to antiretroviral therapy (ART) following the hypnotherapy intervention. The Wilcoxon signed-rank test yielded a Z value of -3.469 with a p-value of 0.001, indicating a statistically significant difference in ART adherence scores before and after the intervention. These findings suggest that hypnotherapy may contribute to improved ART adherence among some PLHIV receiving treatment at urban primary healthcare facilities, although the observed improvements were not consistent across all participants.

The Wilcoxon signed-rank analysis further demonstrated that 15 subjects (50.0%) exhibited enhanced ART adherence following the hypnotherapy session, whereas the remaining 15 participants (50.0%) maintained their existing adherence levels. Crucially, following the intervention, none of the individuals showed a decrease in adherence. Furthermore, based on Cohen's categorization, the computed effect size ( $r = 0.63$ ) indicated a large effect of the intervention. Nevertheless, considering that approximately half of the participants showed no improvement in adherence, these findings should be interpreted cautiously with respect to their clinical significance (Aunon et al., 2023; Gumede et al., 2024).

The lack of improvement among approximately half of the participants highlights the multifactorial nature of ART adherence. In addition to psychological factors, adherence is influenced by a range of individual, social, and treatment-related factors, including established medication-taking habits, perceived stigma, treatment fatigue, social support, and access to healthcare services. These factors may explain why some participants responded more favorably to the hypnotherapy intervention than others. Clinically, the findings suggest that hypnotherapy may be considered a complementary intervention to support ART adherence in selected individuals; however, it should not be viewed as a stand-alone strategy. Integrating hypnotherapy with comprehensive adherence support that addresses behavioral, psychosocial, and structural barriers is likely to provide greater benefits for people living with HIV.

The advantages of hypnosis may be explained by neuropsychological and cognitive-behavioral processes. Hypnotic suggestion facilitates focused attention, boosts motivation, modifies maladaptive beliefs, increases self-efficacy, and improves emotional regulation. These psychological processes may increase adherence to lifetime ART, decrease treatment avoidance, and encourage more consistent medication-taking behavior. Similar pathways have been found in studies evaluating hypnosis for managing chronic pain, lowering anxiety, stopping smoking, and other health-related behavioral interventions (Fions et al., 2015; Šuser et al., 2016). These findings are also consistent with studies showing that self-efficacy is one of the greatest psychological markers of long-term ART adherence (Johnson et al., 2007).

The results are in line with earlier research showing that behavioral and psychological interventions can enhance adherence to antiretroviral therapy (ART) by addressing the emotional and cognitive determinants of medication-taking behavior, even though this study used a pre-experimental one-group design without a control group. However, the lack of randomization and the very brief follow-up period restrict the capacity to determine causal links and evaluate the intervention's long-term durability. To verify the efficacy of hypnotherapy in enhancing long-term

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ART adherence, more randomized controlled trials with bigger sample sizes and longer follow-up times are necessary (Kanters et al., 2017).

Practically speaking, hypnotherapy might be a workable supplemental intervention in HIV care services, especially in primary healthcare settings with minimal psychological resources. Once healthcare personnel obtain the necessary training, the intervention is relatively short, non-pharmacological, and economical. Including hypnotherapy in routine adherence counseling may strengthen psychological support and has the potential to improve ART adherence among selected individuals, particularly when integrated with comprehensive adherence interventions. (UNAIDS, 2024; World Health Organization, 2021). Including hypnotherapy in routine adherence counseling may strengthen psychological support and has the potential to improve ART adherence among selected individuals, particularly when integrated with comprehensive adherence interventions (UNAIDS, 2024; World Health Organization, 2021). Consistent with previous evidence, adherence support is more effective when psychological, social, and biomedical interventions are delivered in an integrated manner. Therefore, behavioral interventions such as hypnotherapy should be considered as complementary components of routine HIV care rather than stand-alone interventions (Safren et al., 2009).

Hypnotherapy may also be incorporated into standard HIV services because nurses maintain continuous communication with patients during counseling, medication administration, adherence monitoring, and follow-up care. Incorporated into standard HIV services since nurses stay in constant communication with patients during counseling, medication administration, adherence monitoring, and follow-up care. Long-term retention in HIV care, sustained ART adherence, and patient-centered outcomes may all be enhanced by incorporating evidence-based behavioral treatments into basic healthcare. Long-term retention in care and differentiated HIV service delivery have been found to depend on strengthening nurse-led adherence support (Horvath et al., 2012; Rouleau et al., 2019; World Health Organization, 2021).

For certain PLHIV who experience low motivation, stigma-related distress, or recurrent adherence problems, primary healthcare facilities may consider structured hypnotherapy as an adjunct nursing intervention. The intervention should be delivered by trained personnel and integrated into routine adherence counseling and multidisciplinary HIV care to maximize its potential benefits.

## Implications

This study indicates that hypnotherapy can be implemented as a safe and efficient complementary nursing intervention to help people living with HIV (PLHIV) overcome psychological barriers such as anxiety, treatment fatigue, and internalized stigma. At the primary healthcare level (Community Health Centers/Puskesmas), integrating relaxation techniques and positive suggestion into routine adherence counseling has the potential to strengthen patients' self-regulation and motivation to maintain long-term adherence to antiretroviral therapy (ART). Furthermore, the study findings underscore the importance of capacity building and advanced therapeutic communication training for nurses to facilitate holistic HIV care and support the achievement of sustained viral suppression targets.

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## Research contribution

This study adds to the increasing amount of research on psychological therapy targeted at enhancing HIV-positive individuals' adherence to antiretroviral medication (ART). To the best of our knowledge, this is one of the first studies to assess organized hypnosis as an additional nursing intervention in Indonesian primary healthcare settings. The results offer initial proof that a short psychological intervention could improve ART adherence and facilitate the incorporation of behavioral strategies into community-based HIV treatment services.

## Limitations

The study used a one-group pretest-posttest design without a control group. The sample was limited to 30 participants from three public health centers. The posttest follow-up period was relatively short; therefore, long-term adherence and sustained viral suppression could not be evaluated. In addition, this study did not include objective virological outcomes, such as plasma HIV

viral load, which is<sup>54</sup> considered the gold standard for evaluating the clinical effectiveness of antiretroviral therapy. Consequently, it remains unclear whether the observed improvement in self-reported ART adherence translated into sustained viral suppression.

The lack of alternative<sup>37</sup> objective adherence metrics, like electronic medication monitoring or pharmacy refill data, is another drawback. Due to recollection bias and social desirability bias, relying solely on self-reported adherence may have overstated real medication-taking behavior. To provide more solid proof of hypnotherapy's efficacy, future research should integrate subjective adherence surveys with objective adherence metrics and virological outcomes (Althubaiti, 2016).

### Suggestions

To assess the long-term<sup>10</sup> sustainability of hypnotherapy benefits on adherence to antiretroviral medication (ART), future research should use randomized controlled trial designs with bigger sample sizes and longer follow-up periods<sup>22</sup>. To improve the validity of adherence evaluation, future studies should also include objective clinical outcomes including plasma HIV viral load, retention in care, pharmacy refill records, and electronic medication monitoring. Additionally, before incorporating hypnotherapy into conventional HIV care, nurses and other medical personnel should undergo standardized training.

### CONCLUSION

This study found a statistically significant difference in ART adherence before and after the hypnotherapy intervention among people living with HIV receiving care at urban primary healthcare facilities in Jambi City. Nevertheless, improvement in adherence was observed in only half of the participants, while the remaining participants showed no change. These findings suggest that hypnotherapy may provide benefits for selected individuals as a complementary nursing intervention, but it should not be considered a stand-alone approach to improving ART adherence. Future randomized controlled trials with larger sample sizes, longer follow-up periods, and objective clinical outcome measures are needed to confirm the long-term clinical effectiveness of hypnotherapy. Integrating hypnotherapy with comprehensive behavioral, psychosocial, and adherence support strategies may strengthen HIV care, particularly in resource-limited primary healthcare settings.

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### AUTHOR CONTRIBUTION STATEMENT

RD created the study idea, gathered information, conducted data analysis, and wrote the manuscript. IP reviewed the methodology, oversaw the research process, and improved the text. ML oversaw the community nursing viewpoint and contributed significantly to the manuscript's development.

### AI DISCLOSURE STATEMENT

When preparing the manuscript for English translation and language improvement, the author employed an AI-assisted language tool. The author took full responsibility for the publication's content after using the tool, reviewing and editing it as necessary.

### CONFLICTS OF INTEREST

The authors affirm that they have no financial, institutional, or personal conflicts of interest that might affect how this study is conducted, how data is analyzed, how the paper is prepared, or if it is published.

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