

Jurnal Info Kesehatan

Vol. 23, No. 4, December 2025, pp. 783-793

P-ISSN 0216-504X, E-ISSN 2620-536X

DOI: [10.31965/infokes.Vol23.Iss4.1994](https://doi.org/10.31965/infokes.Vol23.Iss4.1994)Journal homepage: <https://jurnal.poltekkeskupang.ac.id/index.php/infokes>**RESEARCH****Open Access****The Effect of Self-Resignation Exercise on the Quality of Life of HIV Patients****Evi Nurhayatun^{1a*}, Ratih Arianita Agung^{2b}, Hanifan Danu Wijaya^{3c}, Muhammad Ifham Hanif^{3d}, Dhani Redhono Harioputro^{1e}**¹ Division of Tropical Infection Diseases, Department of Internal Medicine, Medical Faculty of Sebelas Maret University/Dr. Moewardi General Hospital, Surakarta, Central Java, Indonesia² Division of Psychosomatic and Palliative Medicine, Department of Internal Medicine, Medical Faculty of Sebelas Maret University/Dr. Moewardi General Hospital, Surakarta, Central Java, Indonesia³ Department of Internal Medicine, Medical Faculty of Sebelas Maret University/Dr. Moewardi General Hospital, Surakarta, Central Java, Indonesia^a Email: evi.nurhayatun@staff.uns.ac.id^b Email: arianitaagung@gmail.com^c Email: hanifandanu1994@gmail.com^d Email: muhammadifhamhanif@gmail.com^e Email: dhani_redhono@staff.uns.ac.id

Received: 22 May 2025

Revised: 11 October 2025

Accepted: 11 October 2025

Abstract

People living with HIV/AIDS (PLWHA) are vulnerable to anxiety related to their illness, which can adversely affect inflammatory markers such as the Neutrophil-to-Lymphocyte Ratio (NLR) and overall quality of life (QOL). This study aimed to examine the effect of Self-Resignation Exercise as a complementary and holistic intervention on NLR and quality of life among HIV patients experiencing anxiety disorders. A randomized controlled trial with a pretest–posttest control group design was conducted in the Infection Subsection of Dr. Moewardi Hospital, Surakarta, starting in January 2024. Participants were HIV patients with anxiety disorders who had stable physical conditions and received routine treatment, and they were randomly assigned to a control group (n = 20) and an intervention group (n = 20). Anxiety levels were assessed using the Hamilton Rating Scale for Anxiety (HRSA), quality of life was measured with the WHOQOL-BREF, and inflammatory status was evaluated through blood tests to determine NLR. The intervention group received Self-Resignation Exercise in addition to standard care, while the control group received standard care alone. The results demonstrated a significant reduction in anxiety levels and a significant improvement in quality of life in the intervention group compared to the control group, with all measured outcomes showing p-values < 0.001. In conclusion, Self-Resignation Exercise is effective in reducing anxiety and improving quality of life in people living with HIV/AIDS, indicating its potential as a complementary approach to enhance both psychological well-being and overall health status.

Keywords: Self-Resignation Exercise, Human Immunodeficiency Virus, Neutrophil to Lymphocyte Ratio, Quality of Life.**Corresponding Author:**

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1. INTRODUCTION

HIV is a chronic infection that weakens the immune system and reduces quality of life. According to UNAIDS (2024), an estimated 39.9 million people worldwide were living with HIV by the end of 2023, including approximately 57.299 cases in Indonesia (UNAIDS, 2024). Despite some reduction in new infections, access to antiretroviral therapy (ART) remains limited, with only a small proportion achieving viral suppression (Gaebler et al., 2022). These challenges contribute to increased psychological stress and anxiety among people living with HIV/AIDS (PLWHA) compared to the general population (Ethel et al., 2016).

Anxiety disorders are characterized by excessive anxiety accompanied by behavioral, emotional, and physiological responses that interfere with social and occupational functioning (Kaplan et al., 2010; Szuhany, & Simon, 2022). Among these disorders, Generalized Anxiety Disorder (GAD) is one of the most prevalent, with an annual prevalence ranging from 3% to 8%, and it is frequently comorbid with other mental health conditions, particularly depression (Talbot, 2012).

Chronic anxiety and stress are associated with dysregulation of the immune system, which is often reflected by an elevated Neutrophil-to-Lymphocyte Ratio (NLR) a biomarker of systemic inflammation (Jannesar et al., 2024). A high NLR indicates increased inflammatory response and reduced adaptive immunity, both of which are linked to poorer quality of life (Imtiaz et al., 2012; Miners et al., 2014).

Psychological interventions, including relaxation and meditation, have been shown to reduce anxiety and improve the quality of life among individuals with chronic diseases (Corno et al., 2019). One promising method is the Self-Resignation Exercise (Latihan Pasrah Diri/LPD), which combines relaxation, breathing regulation, and spiritual meditation (dhikr). LPD has demonstrated effectiveness in alleviating anxiety in patients with chronic conditions such as hypertension, diabetes, and cancer. However, no studies have yet examined its effect on NLR and quality of life among PLWHA with anxiety disorders.

Therefore, this study aims to investigate the effect of Self-Resignation Exercise on Neutrophil-to-Lymphocyte Ratio and quality of life in people living with HIV/AIDS who experience anxiety disorders, as a complementary and holistic approach to improving both physical and psychological well-being.

2. RESEARCH METHOD

This study employed an interventional research approach using an experimental design, specifically a randomized controlled trial (RCT) with a pretest–posttest design. In this design, participants were randomly assigned to intervention and control groups, and the researchers administered a structured intervention to evaluate the effects of the Self-Resignation Exercise during the study period.

The study was conducted in the Infection Subsection of Dr. Moewardi General Hospital, Surakarta, starting in January 2024. The research population consisted of people living with HIV/AIDS who were undergoing HIV therapy at the Infection Subsection of Dr. Moewardi General Hospital during the January 2024 study period.

Eligible participants were selected based on predefined inclusion and exclusion criteria. The inclusion criteria were: (1) a diagnosis of an anxiety disorder, (2) willingness to participate and provide informed consent, and (3) the ability to perform the intervention according to the prescribed procedure. The exclusion criteria included: (1) worsening clinical conditions related to HIV or other comorbid diseases requiring hospitalization, (2) current use of anti-anxiety medications, (3) the presence of shortness of breath, and (4) refusal to participate in the study.

Data were collected using a purposive sampling technique, categorical variables were presented as frequencies and percentages, and data normality was assessed using the Shapiro–Wilk test. For within-group analysis, comparisons between pre- and post-intervention

measurements were conducted using paired-sample statistical tests. Variables with a normal distribution were analysed using the paired t-test, while non-normally distributed data were analysed using the Wilcoxon signed-rank test.

For the between-group analysis, differences between the intervention and control groups were examined by calculating change scores for each participant (posttest minus pretest) and comparing these scores across groups. If the data are normally distributed, an independent samples t-test is applied; otherwise, the Mann–Whitney U test is used as a non-parametric alternative. Additionally, when assumptions of normality and homogeneity of variance were met, a two-way mixed analysis of variance (ANOVA) was conducted to evaluate the main effects of time and group, as well as the interaction effect between time and group. The interaction effect provides key evidence of whether the intervention produced changes different from the control group. All statistical analyses were performed using Statistical Product and Service Solutions (SPSS) version 26.0 (IBM Corp, Armonk, NY). Statistical significance was determined at a p-value of < 0.05 with a 95% confidence interval. This study got permitted from the Health Research Ethics Committee. Dr. Moewardi General Hospital number: 2.072/VIII/HREC/2024.

3. RESULTS AND DISCUSSION

Table 1. Normality Test Results of NLR, QOL, and HRSA Values in Intervention and Control Groups Before and After Treatment.

Group	Variable	Before Treatment	After Treatment	Difference (After–Before)
Intervention	NLR	0.233	0.071	
	QOL	0.575	0.061	
	HRSA	0.582	0.514	
Control	NLR	0.024	0.014	
	QOL	0.087	0.035	
	HRSA	0.100	0.144	
Combined Difference (Control & Intervention)	NLR			0.222
	QOL			0.002
	HRSA			0.003

Table 1 shows that the results of the normality tests indicated that the NLR values in the intervention group were normally distributed both before and after the intervention. Specifically, the pre-intervention NLR showed a p-value of 0.233, while the post-intervention NLR yielded a p-value of 0.071, which, although approaching the threshold of significance, still met the assumption of normality. In contrast, the NLR values in the control group did not follow a normal distribution, with p-values of 0.024 before treatment and 0.014 after treatment.

Comparative analysis between the intervention and control groups revealed that the change in NLR values from pre- to post-intervention was not statistically significant ($p = 0.222$), indicating no meaningful difference between the two groups. However, statistically significant differences were observed in quality of life (QOL) scores ($p = 0.002$) and Hamilton Rating Scale for Anxiety (HRSA) scores ($p = 0.003$). These findings suggest that the Self-Resignation Exercise had a positive effect on improving quality of life and reducing anxiety symptoms among participants compared with the control group.

Table 2. Bivariate Analysis Results of the Comparison of NLR, QOL, and HRSA Values Before and After Treatment in the Control and Intervention Groups

Variable	Group	Median Before Treatment	Median After Treatment	p-value
NLR	Control	3.54	3.09	0.370

	Intervention	3.06	2.77	<0.003
QOL	Control	81.5	79	0.004
	Intervention	61	78.5	<0.001
HRSA	Control	17	17	0.562
	Intervention	19	15	<0.001

Table 2 shows that the within-group analysis of the control group yielded a p-value of 0.370, which exceeds the conventional significance threshold ($\alpha = 0.05$). This result indicates that there was no statistically significant difference in NLR values before and after the observation period in the control group. In contrast, the intervention group showed a statistically significant change in NLR values following treatment, with a p-value of 0.003, which is well below the significance threshold ($\alpha = 0.05$). This finding indicates a significant difference between pre- and post-intervention NLR values, suggesting that the intervention had a positive effect on NLR levels. Overall, these results demonstrate that the treatment applied to the intervention group was effective in significantly modifying NLR values, whereas no significant change was observed in the control group.

The analysis results for the control group showed a p-value of 0.004, indicating a statistically significant difference in QOL scores before and after the observation period, despite the absence of an intervention. This change may reflect the influence of external factors or natural variability affecting participants' quality of life. In contrast, the intervention group demonstrated a highly significant improvement in quality of life, with a p-value of 0.001, indicating a significant difference between pre- and post-intervention QOL scores. These findings provide strong evidence that the intervention had a substantial positive effect on enhancing participants' quality of life.

The paired t-test analysis for the control group resulted in a p-value of 0.562, which exceeds the conventional significance threshold ($\alpha = 0.05$), indicating no statistically significant difference in HRSA scores before and after the observation period. Conversely, the intervention group demonstrated a highly significant reduction in HRSA scores following treatment, with a p-value of 0.001, which is well below the significance threshold. This finding indicates a statistically significant difference between pre- and post-intervention HRSA values, suggesting that the intervention was effective in reducing anxiety levels.

Table 3. Bivariate Analysis Results of the Comparison of the Difference in NLR Values Before and After in the Control and Intervention Groups.

Group	Mean Difference	Standard Deviation	p-value
Control	-0.04	0.41	0.019
Intervention	-0.43	0.56	

Table 3 showed a p-value of 0.019, indicating a statistically significant difference in NLR change scores between the control and intervention groups. These findings suggest that the intervention had a significant effect on altering NLR values.

Table 4. Bivariate Analysis Results of the Comparison of the Difference in QOL Values Before and After in the Control and Intervention Groups

Group	Mean Difference	p-value
Control	-4.00	<0.001
Intervention	13.05	

Table 4 shows that the results of the analysis showed a p-value of 0.001. This highly significant p-value indicates that there is a significant difference between the QOL values in the control group and the intervention group. In other words, the intervention given has a

significant positive impact on improving the quality of life of participants compared to the control group.

Table 5. Bivariate Analysis Results of the Comparison of Differences in HRSA Values Before and After in the Control and Intervention Groups.

Group	Mean Difference	p-value
Control	0.15	<0.001
Intervention	3.65	

Table 5 showed a p-value of 0.001, indicating a highly significant difference in HRSA change scores between the control and intervention groups. In other words, the intervention was effective in significantly reducing anxiety levels compared with the control condition. In other words, the intervention applied had a significant impact on reducing HRSA scores compared with the control group that did not receive the intervention. The high level of statistical significance ($p < 0.05$) indicates that these findings are unlikely to have occurred by chance. This provides strong evidence that the intervention was effective in influencing anxiety levels, as reflected by changes in HRSA values.

The Effect of Self-Resignation Exercise on Neutrophil to Lymphocyte Ratio (NLR).

The within-group analysis for the control group yielded a p-value of 0.370, which exceeds the conventional significance threshold ($\alpha = 0.05$), indicating no statistically significant difference in NLR values before and after the observation period. In contrast, the intervention group demonstrated a statistically significant change in NLR values following treatment, with a p-value of 0.003, which is well below the significance threshold. Furthermore, the between-group analysis of NLR change scores showed a p-value of 0.019, indicating a statistically significant difference between the control and intervention groups. These findings suggest that the intervention had a significant effect on modifying NLR values compared with the control condition.

The “surrender” exercise, which encompasses various forms of physical activity aimed at reducing stress and improving overall health, has been recognized for its benefits in the management of chronic diseases, including HIV. It has the potential to improve immune function by reducing systemic inflammation and improving psychological well-being, which are particularly important for individuals living with HIV. Recent research has demonstrated a positive association between higher levels of physical activity, including the “surrender” exercise, and improved immune function among people living with HIV, as indicated by a reduction in the neutrophil-to-lymphocyte ratio (NLR). One study found that increased physical activity was associated with a significant decrease in NLR, indicating improved immune function (Kurniawati et al., 2022).

In addition, “surrender” training provides psychological benefits by reducing stress and anxiety two factors that can adversely affect immune function. The psychological benefits of this practice may contribute to increased lymphocyte counts and overall immune resilience in HIV patients (Fook et al., 2024; Suyata et al., 2023). The clinical implications of these findings suggest that integrating surrender training into treatment regimens for HIV patients may provide dual benefits: improving physical health through increased NLR and supporting mental health. This holistic approach has the potential to lead to better health outcomes and quality of life for individuals living with HIV (Aranda et al., 2023; Prianggandanni et al., 2023).

Surrender training focuses on increasing relaxation and reducing emotional distress. These trainings can affect physiological responses in the body, primarily by modulating stress hormones such as cortisol. Chronic stress is known to exacerbate inflammation, leading to increased neutrophil levels and decreased lymphocytes. This imbalance can lead to increased NLR, indicating increased inflammatory activity (Avci et al., 2023).

The potential association between mindfulness practice and NLR suggests that integrating mindfulness practices into healthcare may benefit patients with elevated

inflammatory markers. For example, older adults who are malnourished often show elevated NLR values; thus, incorporating mindfulness practice may improve their nutritional status and overall health outcomes (Avci et al., 2023).

The practice of surrender not only offers psychological benefits but also contributes to holistic health. Engagement in these practices often encourages individuals to adopt healthier lifestyle behaviors, such as improved dietary habits and regular physical activity, which in turn support immune health. Further research suggests that stress reduction techniques can lead to decreased inflammatory markers, including NLR. This is particularly relevant for HIV patients who often experience chronic inflammation due to the virus itself (Fook et al., 2024). Additionally, the practice of surrender can foster psychological resilience to the stressors associated with living with a chronic illness such as HIV. Improved mental health has the potential to improve adherence to antiretroviral therapy (ART), which in turn helps stabilize immune function (Aranda et al., 2023).

Integrating mindfulness practice into treatment plans for HIV patients with anxiety disorders may be beneficial. Evidence suggests that such interventions can lead to improved mental health outcomes and positively influence biological markers such as the NLR. One study found that mindfulness practice significantly increased resilience and reduced perceived stress among HIV-positive individuals (Aghaie et al., 2021).

The relationship between mindfulness practice and NLR is noteworthy. Research shows that stress reduction techniques can lead to reduced levels of inflammatory markers in the body. For example, psychoneuroimmunology-based interventions, including mindfulness and relaxation techniques, have been associated with reduced cortisol levels—an indicator of stress—and improved immune function (Moraes et al., 2018).

Survival practice has a significant mechanism of influence on the relationship between this practice and the neutrophil-lymphocyte ratio (NLR). One such mechanism is stress reduction, as mindfulness practice can lower stress levels, which are known to negatively impact immune function. Chronic stress can lead to increased cortisol levels, which leads to higher neutrophil counts and lower lymphocyte counts. Furthermore, mindfulness training can also improve immune function. By improving psychological well-being, patients can experience an improved immune response, which is especially important for those living with HIV, as maintaining a healthy immune system is key to preventing opportunistic infections (Kaunda-Khangamwa et al., 2020; Prianggandanni et al., 2023).

The Effect of Self-Surrender Training on Quality of Life (QOL).

The analysis results for the control group showed a p-value of 0.004, indicating a statistically significant difference in QOL scores before and after the observation period, despite the absence of an intervention. The significant decrease in quality of life (QoL) observed in the control group, despite not receiving any intervention, may be attributed to several factors. First, the decline in quality of life (QoL) observed in the control group may reflect the natural progression of the disease, as chronic conditions often worsen over time in the absence of active management. Second, psychological and social factors such as disappointment related to not receiving treatment or limited attention from healthcare providers may have negatively influenced participants' well-being. Additionally, external stressors unrelated to the intervention may have contributed to the reduction in QoL scores.

In contrast, participants in the intervention group experienced significant improvements, likely due to receiving active management, health education, and increased attention, all of which may have enhanced physical, psychological, and social functioning. This contrast underscores the importance of targeted interventions in maintaining and improving QoL, as individuals without such support may experience a natural or stress-related decline.

Statistical analysis further supported these observations. The intervention group showed a highly significant improvement in QoL scores, with a p-value of < 0.001 . Moreover, the between-group comparison of QoL change scores yielded a p-value of 0.001, indicating a statistically significant difference between the control and intervention groups.

Research shows that mindfulness training can significantly improve mental health outcomes in HIV patients. Mindfulness-based interventions have been associated with decreased anxiety and depression, common comorbidities in people living with HIV. One study highlighted that mindfulness training not only helps reduce stress but also fosters motivation for healthier behaviors, such as quitting smoking (Asfar et al., 2022). These improvements in mental health can lead to a better overall quality of life.

Recent research suggests that Latihan Pasrah Diri (LPD) can significantly improve quality of life among patients with type 2 diabetes mellitus (T2DM). A randomized controlled trial reported that participants who engaged in LPD experienced improvements in sleep quality and reductions in inflammatory markers associated with chronic disease. These improvements are clinically meaningful, as they may lead to better overall health outcomes and enhanced performance of daily activities (Siswanto et al., 2024). By promoting both physical and psychological well-being, the practice of surrender encourages greater engagement in daily activities, thereby improving overall quality of life (Siswanto et al., 2024).

The psychological mechanisms underlying the comparison of surrender and quality of life may involve improved emotion regulation and reduced stress. A study examining adolescents found that health-related quality of life was strongly associated with factors such as self-efficacy and stress management. These findings suggest that individuals who practice surrender may experience lower levels of stress, thereby improving their overall well-being (Mikkelsen et al., 2020).

The practice of surrender has potential mechanisms that can improve an individual's quality of life. One such mechanism is stress reduction, where surrender promotes relaxation and reduces perceived stress levels. This can have cascading effects on physical health, such as lowering cortisol levels and improving immune function. Furthermore, engaging in surrender practices also fosters mindfulness and acceptance, enabling individuals to better cope with their chronic conditions. This psychological shift can contribute to improved emotional well-being and resilience (Siswanto et al., 2020).

Quality of life (QoL) for patients with HIV encompasses multiple dimensions, including physical health, mental health, social relationships, and overall life satisfaction. Research shows that surrender practice can lead to significant improvements in some of these aspects. Regular physical activity, such as progressive resistance training, has been linked to increased muscle strength and overall physical health among HIV patients. One study found that participants who participated in a 12 week progressive resistance training program reported improved health-related quality of life scores (Hamid & Rajah, 2015).

Self-care training also often incorporates mindfulness practices that can alleviate symptoms of anxiety and depression. In this context, participants in interventions involving mindfulness reported lower stress levels and improved emotional well-being. This is crucial because mental health significantly impacts the overall quality of life for people living with HIV. The mental health benefits of self-care training are particularly relevant for individuals living with HIV, who often experience high levels of depression and anxiety. By fostering a sense of peace and acceptance, this practice can help alleviate symptoms of depression, thereby improving overall quality of life (Hamid & Rajah, 2015; Huang et al., 2024; Marando et al., 2016).

While the benefits of mindfulness training are promising, there are several challenges to its implementation. Many healthcare providers may lack adequate training to deliver such interventions effectively. Furthermore, cultural perceptions surrounding HIV may hinder the acceptance of mindfulness practices among certain populations. Addressing these barriers

through comprehensive training programs for healthcare professionals is crucial to maximize patient benefits (Ali et al., 2023; Tegene et al., 2023).

The Effect of Surrender Training on Anxiety Levels

The paired t-test analysis for the control group produced a p-value of 0.562, indicating no statistically significant difference in HRSA scores before and after the observation period. In contrast, the intervention group demonstrated a statistically significant reduction in HRSA scores following treatment, with a p-value of 0.001. Furthermore, between-group analysis revealed a significant difference in HRSA change scores between the control and intervention groups, indicating that the intervention was effective in reducing anxiety levels compared with the control condition. Patients living with HIV often experience high levels of anxiety due to a variety of factors, including the stigma associated with the disease, concerns about health deterioration, and the complexity of ongoing medical care. Research shows that mental health issues such as anxiety and depression are prevalent in this population, significantly impacting their overall quality of life. Research shows that anxiety can significantly impact the quality of life and overall health outcomes for these individuals. Therefore, addressing these psychological challenges is critical to improving mental and physical health outcomes (Verma et al., 2018).

Surrender practice involves a series of practices designed to foster a sense of acceptance and relaxation. Some forms of this practice include mindfulness meditation, which focuses on the present moment to reduce stress, and yoga, which combines physical postures, breathing techniques, and meditation to improve mental health. Breath control practice is also part of this approach, where certain techniques are used to regulate the breath and induce calm. These practices are believed to reduce anxiety by increasing the relaxation response in the body, thereby helping to counteract the physiological stress response often associated with anxiety disorders (Fauziah, 2022). Surrender practice has a significant impact on anxiety levels, especially in individuals dealing with chronic illnesses such as HIV. Several studies have demonstrated that physical activity and mindfulness-based practices have positive effects on mental health. In particular, physical activity such as aerobic exercise has been shown to significantly reduce anxiety levels among people living with HIV, thereby improving both physical and psychological well-being (Verma et al., 2018).

4. CONCLUSION

Based on the results of the research and discussion, it can be concluded that there is an influence of surrender training on the level of anxiety in patients with HIV, there is an influence of surrender training on the Neutrophil to lymphocyte ratio (NLR) and there is an influence of surrender training on the quality of life in patients with HIV with anxiety disorders. Self-surrender exercises can help reduce anxiety levels, lower the neutrophil to lymphocyte ratio and improve Quality of life.

ACKNOWLEDGMENT

Thank you to LPPM UNS for the Community Service Grant Funded by Non-State Budget Revenue (Non-APBN) Universitas Sebelas Maret Fiscal Year 2025. Grant Number: 370/UN27.22/PT.01.03/2025.

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