



## A Pilot Study of Loving-Kindness and Self-Compassion Meditation on Depressive Symptoms among People Living with HIV

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### Abstract

Individuals living with HIV frequently experience elevated depressive symptoms due to chronic stress, stigma, and emotional burden. Compassion-based interventions such as Loving-Kindness and Self-Compassion Meditation (LKCM) have the potential to improve emotional well-being, yet evidence in HIV-positive populations remains limited. This study examined the preliminary effects of a brief Loving-Kindness and Self-Compassion Meditation (LKCM) intervention on depressive symptoms among individuals living with HIV. It was hypothesized that participants receiving LKCM would show greater reductions in depression than those in a control condition. Using a quasi-experimental pretest–posttest control group design, 18 participants were assigned to either an experimental group ( $n = 10$ ) that received a two-session LKCM intervention or a no-treatment control group ( $n = 8$ ). Depressive symptoms were assessed using the DASS-21 depression subscale before and after the intervention. The results revealed significant reductions in depressive symptoms over time in both groups, with a greater magnitude of reduction in the LKCM group; however, between-group differences did not reach statistical significance. Effect size estimates indicated a pattern of greater within-group change in the LKCM group, without supporting conclusions regarding intervention-specific benefits. These findings provide preliminary evidence that LKCM may offer short-term psychological benefits for individuals living with HIV, although definitive conclusions regarding effectiveness cannot be drawn. Larger, adequately powered trials with extended follow-up are warranted to confirm these findings and clarify the potential role of LKCM as a depression management strategy in resource-limited settings.

**Keywords:** compassion-based interventions; depression; HIV; loving-kindness meditation; self-compassion

Human Immunodeficiency Virus (HIV) infection remains an unresolved global health concern. According to UNAIDS (2026), more than 40.8 million individuals are living with HIV worldwide, with 1.3 million new infections and approximately 630,000 AIDS-related deaths reported in 2024. Although 77% of people living with HIV (PLHIV) have accessed antiretroviral therapy (ART), psychosocial burden continues to be a major challenge in disease management (Carter et al., 2024; UNAIDS, 2026).

Depression is one of the most common psychological disorders among PLHIV. Meta-analytic findings indicate a depression prevalence of 36% among PLHIV in Africa, with rates exceeding 50% in Ethiopia and Nigeria (Gebru et al., 2024; Lebimoyo et al., 2025; Molapo et al., 2025). Depression prevalence among PLHIV is reported to be two to four times higher than in the general population (Gebru et al., 2024). Depression not only reduces quality of life and increases psychosocial burden but also undermines ART adherence, elevates viral load, and accelerates disease progression (Rivera Rivera & Vazquez Santiago, 2016; Waldron et al., 2021). Several risk factors contribute to this vulnerability, including unemployment, stigma, marital status, female gender, and low social support (Brion et al., 2014; Deshmukh et al., 2017; Lebimoyo et al., 2025).

In Indonesia, the psychosocial vulnerability of PLHIV is particularly pronounced. An estimated 570,000 people are living with HIV, yet only 31% are accessing ART, and

just 14% have achieved viral suppression (UNAIDS, 2026). The epidemic is largely concentrated among key populations—men who have sex with men, sex workers, people who inject drugs, and transgender individuals—who experience heightened stigma and social exclusion. In addition, HIV prevention and psychosocial support programs depend heavily on external funding, and recent disruptions to donor-supported community services have further constrained access to peer and mental health support (UNAIDS, 2026).

Consistent with these structural challenges, studies in Indonesia report a high burden of depressive symptoms among PLHIV. Approximately 50.9% of PLHIV receiving ART in Jakarta were found to exhibit clinically significant depressive symptoms (Yuniastuti et al., 2021), aligning with international evidence showing a depression prevalence of 20–40% among individuals with HIV (Pence et al., 2018). Moreover, perceived stigma and reduced quality of life have been consistently associated with depressive symptoms among PLHIV in Indonesia, underscoring the complex psychosocial burden that this population faces (Stefanovic et al., 2024). Various psychological interventions, such as Cognitive Behavioral Therapy (CBT) and group psychotherapy, have demonstrated effectiveness in reducing depressive symptoms among PLHIV (Honagodu et al., 2013; Mendez et al., 2021; Qin et al., 2022). However, most studies have examined short-term effects and are limited by methodological constraints and implemen-

tation challenges. In many low-income settings, restricted access to mental health providers remains a major barrier to sustainable intervention delivery. A systematic review by Du Zeyang et al. (2022) suggests that psychosocial interventions delivered by nonspecialists can be effective in low-resource contexts, yet there remains a pressing need for low-cost, accessible, and self-administered approaches.

One emerging approach is Loving-Kindness Meditation (LKM) and Self-Compassion Meditation. These compassion-based practices cultivate feelings of warmth and kindness toward oneself and others and have been shown to enhance emotional well-being, reduce self-criticism, and improve emotional regulation (Hofmann et al., 2011; Neff & Germer, 2012). Proof-of-concept research demonstrates that LKM yields significant reductions in depressive symptoms while enhancing positive affect and adaptive emotion-regulation strategies (Hofmann et al., 2015). Moreover, a systematic review by Bashir et al. (2025) found that long-term LKM practitioners exhibit structural and functional brain differences in regions associated with empathy, compassion, and well-being, supporting the hypothesis that neuroplastic mechanisms may underlie LKM's emotional benefits.

Within the context of HIV, Brion et al. (2014) reported that higher levels of self-compassion are associated with lower stress and shame, better medication adherence, and more adaptive attitudes toward HIV status. From a psychological perspective, compassion-based processes may contribute to reductions in depressive symptoms through multiple pathways. At the cognitive level, self-compassion helps reduce maladaptive self-criticism, hopelessness, and negative self-schemas commonly observed among PLHIV, replacing them with more balanced and accepting self-appraisals (Yona et al., 2023). At the affective level, cultivating loving-kindness and compassion has been shown to alleviate chronic shame, guilt, and emotional distress while enhancing feelings of warmth, safety, and emotional regulation (Aliche et al., 2025; Skelton et al., 2020). Behaviorally, increased self-compassion may reduce avoidance and disengagement, promote greater adherence to treatment, and encourage more adaptive coping and self-care behaviors (Sirois & Hirsch, 2018). Together, these cognitive, affective, and behavioral mechanisms suggest that compassion-based interventions may have direct clinical relevance for PLHIV, who frequently experience internalized stigma, persistent emotional distress, and shame.

Despite accumulating evidence supporting LKM and Self-Compassion Meditation in the general population and individuals with mood disorders, research evaluating their effectiveness specifically among PLHIV remains scarce. This research gap underscores the absence of rigorous evidence regarding the potential of compassion-based meditation to reduce depressive symptoms in PLHIV, particularly in low-resource settings with limited access to mental health care.

To address this gap, the present study aims to evaluate the effectiveness of Loving-Kindness Meditation and Self-Compassion Meditation as low-cost, accessible, and theoretically grounded nonpharmacological interventions in reducing depressive symptoms among individuals living with HIV. This study seeks to provide empirical evidence that informs the development of adaptive, feasible, and

contextually relevant psychological interventions for PLHIV.

## 1. Methods

### 1.1 Research Design and Variables

This study employed a quasi-experimental design with a pretest–posttest control group structure. Participants were recruited through convenience sampling and non-randomly assigned to either the experimental group or the control group based on their availability and willingness to participate in the intervention sessions. The research team determined group allocation prior to the intervention, after completion of the baseline (pretest) assessment. The experimental group received the Loving-Kindness and Self-Compassion Meditation (LKCM) intervention, while the control group received no treatment during the study period. The independent variable was the LKCM intervention, and the dependent variable was depressive symptoms, measured using the depression subscale of the DASS-21. Accordingly, no randomization or blinding procedures were employed, as the quasi-experimental design was selected to accommodate the community-based setting and ethical considerations when working with PLHIV.

### 1.2 Participants

Participants were individuals diagnosed with HIV who resided in the Special Region of Yogyakarta and surrounding areas. They were recruited using purposive sampling in collaboration with a community organization supporting people living with HIV (PLHIV). Recruitment targeted individuals who met specific inclusion criteria relevant to the study objectives.

The inclusion criteria were: (a) being 20 years or older and (b) receiving antiretroviral therapy (ART) for at least one year. All participants underwent an initial screening prior to inclusion in the study. For safety and ethical reasons, individuals with a history of severe psychiatric disorders (e.g., psychotic disorders), current use of psychopharmacological treatment for severe mental illness, active suicidal ideation, or acute medical conditions were excluded from participation. Participants who exhibited severe depressive symptoms during screening were also excluded and referred to appropriate mental health services.

A total of 18 participants took part in the study. Participants assigned to the experimental group ( $n = 10$ ) received the Loving-Kindness and Self-Compassion Meditation (LKCM) intervention consisting of two sessions. Participants in the control group ( $n = 8$ ) did not receive any psychological intervention during the study period and continued with their usual care. Participants ranged in age from 26 to 48 years, with representation of both men and women. All participants provided written informed consent.

In total, 30 individuals were approached through the collaborating community organization. Of these, 18 consented to participate and met the eligibility criteria. Reasons for non-participation were not systematically recorded.

Participants in the experimental group ( $n = 10$ ) had a mean age of 34.63 years ( $SD = 7.94$ ), with equal representation of men ( $n = 5$ ) and women ( $n = 5$ ). Participants in

the control group ( $n = 8$ ) had a mean age of 33.50 years ( $SD = 4.03$ ) and consisted of six men and two women. Overall, the sample ( $N = 18$ ) had a mean age of 34.06 years ( $SD = 6.20$ ), with the majority being male ( $n = 10$ ).

### 1.3 Instrument

Depressive symptoms were measured using the depression subscale of the Depression Anxiety Stress Scale-21 (DASS-21). In this study, the Indonesian version of the DASS-21 was used. This version has been culturally adapted and psychometrically validated for use in Indonesian populations. Previous validation studies have demonstrated that the Indonesian DASS-21 shows good construct validity and reliability, including high internal consistency and satisfactory measurement properties across diverse adult samples (Hakim & Aristawati, 2023; Ifdil et al., 2022).

The depression subscale consists of seven items rated on a four-point Likert scale (0–3). Total scores were multiplied by two to obtain a 0–42 range. Severity categories followed established scoring guidelines. The DASS-21 has been widely used in clinical and HIV-related research.

### 1.4 Procedure

The study was conducted in three sequential phases (pre-intervention, intervention, and post-intervention), implemented across two separate meetings. The first meeting consisted of the pre-intervention phase and the initial intervention session, while the second meeting was held one week later.

During the pre-intervention phase, participants were informed about the purpose and procedures of the intervention, provided written informed consent, and attended a brief introductory session led by a licensed clinical psychologist who served as the experimenter. Following this introduction, participants completed the DASS-21 depression subscale, which served as the pretest measure.

The intervention phase consisted of two structured sessions of the Loving-Kindness and Self-Compassion Meditation (LKCM) program delivered by the clinical psychologist. The intervention integrated two core components: Loving-Kindness Meditation (LKM), which involves directing feelings of warmth and compassion toward oneself and others through guided visualization, and Self-Compassion Meditation (SCM), which focuses on fostering self-acceptance, reducing self-critical thoughts, and cultivating emotional warmth. Each session lasted approximately four to six hours and included a combination of guided meditation practices, facilitator-led discussions, and reflective exercises.

The first session introduced participants to basic meditation principles and the psychological benefits of compassion-based practices. This was followed by guided LKM exercises, in which participants visualized sending kindness to themselves and important others, and SCM exercises designed to enhance self-kindness and mindful acceptance. The session concluded with a group reflection intended to consolidate learning and encourage continued personal practice.

The second session began with a short walking meditation to promote bodily awareness, followed by a guided

reflection on the participants' independent practice between sessions. Participants were then invited to repeat one LKM and one SCM exercise they found personally meaningful, thereby deepening their engagement with the techniques. At the end of the second session, participants completed the DASS-21 posttest and an evaluation of the training. Several procedure checks were applied to monitor the implementation of the intervention and ensure fidelity to the planned protocol. Participant attendance was recorded for both sessions, and participants' engagement with the meditation practices was monitored through facilitator-led reflective discussions during each session. In addition, a brief training evaluation was administered at the end of the intervention to assess participants' understanding of the LKCM techniques and their perceived engagement with the program. These procedures were used to confirm that the intervention was delivered as intended.

In the post-intervention phase, participants provided feedback on the training experience and the implementation of the LKCM program. Posttest scores were used to assess short-term changes in depressive symptoms following the intervention.

### 1.5 Data Analysis

Data were analyzed using SPSS. Normality was assessed using the Shapiro–Wilk test. Within-group differences were examined using paired-sample t-tests, and between-group differences were assessed using independent-sample t-tests on change scores. Cohen's  $d$  was calculated to determine effect sizes. Given the small sample size, statistical findings were interpreted cautiously, and effect size estimates were emphasized to provide complementary information beyond p-values.

### 1.6 Ethical Considerations

The study protocol was reviewed and approved by the Ethics Committee of the Faculty of Psychology, Universitas Mercu Buana Yogyakarta (Approval No.: 345/A.10/J/II/2025). Ethical approval was required because the study involved people living with HIV, a population considered socially and clinically vulnerable, and addressed mental health outcomes, including depressive symptoms.

Participation in this study was entirely voluntary. Prior to participation, all participants received a detailed explanation of the study objectives, procedures, potential risks, and expected benefits, and provided written informed consent. Confidentiality and anonymity were ensured by assigning coded identifiers to all data, which were securely stored and used solely for academic and research purposes.

As part of the safety and ethical procedures, participants underwent an initial screening for depressive symptoms. Individuals who exhibited severe depressive symptoms or expressed active suicidal ideation were excluded from the study and referred to appropriate mental health services through the collaborating community organization or local healthcare facilities. The research team provided no clinical intervention beyond referral.

Participants did not receive financial reimbursement or monetary compensation for participation. However, re-

freshments were provided during the intervention sessions, and a small souvenir was given as a non-coercive token of appreciation.

## 2. Result

This study examined the effectiveness of the Loving-Kindness and Self-Compassion Meditation (LKCM) intervention in reducing depressive symptoms among individuals living with HIV. A total of 18 participants took part in the research, with 10 assigned to the experimental group and 8 to the control group. Depressive symptoms were assessed using the DASS-21 depression subscale at pretest and posttest.

### 2.1 Descriptive Statistics

Descriptive analyses indicated a substantial decrease in depression scores in the experimental group, from a pretest mean of 18.60 ( $SD = 9.79$ ) to a posttest mean of 6.40 ( $SD = 6.46$ ), yielding a mean reduction of 12.20 points. The control group also decreased, from 17.25 ( $SD = 10.28$ ) to 7.25 ( $SD = 6.89$ ), with a mean reduction of 10.00 points. Table 1 presents a summary of descriptive statistics.

### 2.2 Hypothesis Testing and Effect Size Analysis

Shapiro-Wilk tests confirmed that all variables were normally distributed ( $p < .05$ ), indicating that parametric analyses were appropriate.

A paired-sample  $t$ -test revealed a significant reduction in depressive symptoms within the experimental group,  $t(9) = 5.83$ ,  $p < .001$ , suggesting that LKCM was effective in lowering depression scores. A significant decrease was also observed in the control group,  $t(7) = 4.24$ ,  $p < .01$ , despite the absence of intervention.

To examine group differences, an independent-samples  $t$ -test was performed on the pre-post change scores. The analysis indicated no statistically significant difference between the two groups,  $t(16) = 1.12$ ,  $p = .278$ . Although the experimental group showed a numerically larger reduction in depressive symptoms, the absence of a significant between-group effect suggests that the observed improvements cannot be attributed solely to the LKCM intervention. The reductions observed in both groups may reflect non-specific effects such as repeated measurement, regression to the mean, or general psychosocial support associated with study participation.

Effect size calculations demonstrated a large effect for the experimental group ( $d = 1.57$ ) and the control group ( $d = 1.50$ ). These results indicate substantial changes in depressive symptoms in both groups. The decrease observed in the control group may reflect non-specific influences such as expectancy effects, repeated measurement, or incidental social support during data collection.

## 3. Discussion

This study provides preliminary and exploratory evidence regarding the potential psychological benefits of Loving-Kindness and Self-Compassion Meditation (LKCM) for people living with HIV. Given the quasi-experimental design and limited sample size, the findings should be interpreted as indicative rather than confirmatory, and causal inferences cannot be drawn.

This study demonstrated that the Loving-Kindness and Self-Compassion Meditation (LKCM) intervention resulted in a significant reduction in depressive symptoms in the experimental group. Although the difference between the experimental and control groups did not reach statistical significance, the larger within-group effect size observed in the experimental group should be interpreted cautiously and does not support conclusions regarding intervention-specific effects, particularly for individuals living with HIV who experience chronic emotional burden. Taken together, these findings underscore the need for further research to examine the potential role of brief compassion-based interventions in supporting psychological well-being among people living with HIV.

At the cognitive level, LKCM encourages a shift from maladaptive self-criticism, hopelessness, and negative self-evaluations toward more compassionate and accepting self-appraisals. Such cognitive changes are particularly relevant for people living with HIV, who often internalize stigma and develop negative self-schemas related to illness and social identity. By repeatedly cultivating self-kindness and nonjudgmental awareness, participants may experience reduced rumination and cognitive vulnerability to depression.

At the affective level, loving-kindness and self-compassion practices are designed to regulate emotional responses by reducing chronic feelings of shame, guilt, and emotional distress, while enhancing warmth, safety, and emotional soothing. These affective shifts may buffer stress responses and alleviate emotional exhaustion commonly experienced by PLHIV. Improved emotional regulation has been consistently linked to reductions in depressive symptom severity in compassion-based and mindfulness-based interventions.

Behaviorally, increased self-compassion may promote greater engagement in adaptive coping and self-care behaviors, including improved adherence to daily routines and health-related behaviors. For PLHIV, such behavioral engagement may indirectly contribute to improved psychological well-being by reducing avoidance, increasing perceived self-efficacy, and fostering a more proactive stance toward illness management. Together, these cognitive, affective, and behavioral processes provide a plausible explanation for how LKCM may contribute to short-term reductions in depressive symptoms, even within a brief intervention format.

The present results are consistent with previous evidence showing that Loving-Kindness Meditation (LKM) enhances positive affect and reduces depressive symptoms across various clinical groups (Hofmann et al., 2015). Neuropsychological studies have further proposed that long-term compassion-based practices are associated with structural and functional changes in brain regions involved in empathy, social connectedness, and emotional regulation (Bashir et al., 2025). However, the present study did not directly examine these neurobiological mechanisms. Therefore, such findings should be interpreted as providing theoretical context rather than explanatory evidence for the current results.

In addition, prior work by Brion et al. (2014) emphasizes the protective role of self-compassion among PLHIV, showing associations with lower stress, shame, and emo-

**Table 1**  
*Mean and Standard Deviation of DASS-21 Depression Scores at Pretest and Posttest*

| Group        | N  | Pretest ( <i>M</i> ± <i>SD</i> ) | Posttest ( <i>M</i> ± <i>SD</i> ) | Mean Difference |
|--------------|----|----------------------------------|-----------------------------------|-----------------|
| Experimental | 10 | 18.60 ± 9.79                     | 6.40 ± 6.46                       | 12.20           |
| Control      | 8  | 17.25 ± 10.28                    | 7.25 ± 6.89                       | 10.00           |

tional distress. In this study, Self-Compassion Meditation (SCM) components, such as the Compassionate Letter to Myself and Compassionate Body Scan, likely reduced self-criticism and enhanced self-acceptance. These mechanisms are highly relevant for PLHIV, who often struggle with internalized stigma and identity-related challenges. Thus, this study contributes to the growing literature demonstrating that compassion-based practices can support emotional well-being in populations with psychosocial vulnerability.

The relational dimension of LKCM also appears to play a meaningful role. Compassion directed toward significant others may enhance perceived social connection, which is a well-documented protective factor against depression among PLHIV (Hofmann et al., 2011). Compared with traditional cognitive-based interventions, LKCM offers a unique interpersonal component by engaging individuals in affectively meaningful imagery, potentially strengthening feelings of belonging and reducing social isolation.

An unexpected but informative finding is the significant reduction in depressive symptoms in the control group. Although not exposed to the intervention, this group still showed meaningful improvement. This may reflect the repeated-measurement effect, in which individuals become more aware of their emotional state through repeated self-assessment (Long et al., 2025). Additionally, a response shift—a restructuring of internal standards or cognitive appraisal—may have occurred as participants engaged in reflective evaluation throughout the study (Verdam et al., 2021). These observations underscore that even passive participation in psychological research may have therapeutic effects on vulnerable populations.

3.1 Limitations

Several methodological limitations should be acknowledged. First, the small sample size substantially limits statistical power and increases the risk of both Type I and Type II errors. Second, the non-randomized design and absence of blinding reduce internal validity and preclude causal inference. Third, the use of a no-treatment control group limits conclusions regarding comparative effectiveness and increases susceptibility to expectancy and measurement effects.

In addition, the brief intervention format and lack of follow-up assessments prevent conclusions regarding the long-term sustainability of the observed changes. Finally, the study relied on self-report measures of depressive symptoms, which may be influenced by social desirability or response bias. Accordingly, the findings should be interpreted with caution and cannot be generalized beyond the specific study context.

4. Conclusion

The present study aimed to explore whether a brief compassion-based intervention, Loving-Kindness and Self-Compassion Meditation (LKCM), could reduce depressive symptoms among individuals living with HIV. Given the small sample size and quasi-experimental design, the findings should be interpreted as preliminary evidence rather than definitive proof of effectiveness. While participants in the experimental group showed meaningful reductions in depressive symptoms, similar improvements were also observed in the control group, underscoring the exploratory nature of the results and the need for cautious interpretation.

From a proof-of-concept perspective, this study provides initial indications that a short, two-session LKCM program may be associated with short-term improvements in psychological well-being for individuals living with HIV. The intervention was delivered in a community-based setting, required minimal resources, and was well received by participants, suggesting that LKCM may be a feasible and acceptable approach toward providing psychosocial support in low-resource contexts with limited access to specialized mental health services.

Importantly, the present findings should be viewed as promising signals that warrant further investigation, rather than conclusive evidence of efficacy. Future research should incorporate larger and more diverse samples, active control conditions, and randomized controlled designs to strengthen internal validity and reduce the risk of bias. In addition, follow-up assessments at multiple time points are needed to evaluate the durability and sustainability of LKCM effects on depressive symptoms over time.

4.1 Implications

Despite the study’s methodological limitations, several implications for research and practice can be cautiously considered. From a research perspective, the findings highlight the feasibility of implementing brief compassion-based interventions within community-based HIV settings and support the need for larger, randomized controlled trials with active control conditions and longitudinal follow-up to rigorously evaluate effectiveness.

From a practical standpoint, LKCM is a low-cost, potentially scalable psychosocial approach that may be suitable for low-resource contexts with limited access to specialized mental health services. The adaptability of LKCM for delivery by trained facilitators or non-specialists further enhances its relevance for community-based HIV care. While definitive conclusions regarding efficacy cannot be drawn, the present findings may inform the development and refinement of future interventions aimed at improving the mental health and emotional well-being of people living with HIV.

## 4.2 Recommendation

Based on the findings, it is recommended that future studies implement LKCM using larger and more diverse samples, incorporate active control conditions, and include longitudinal follow-up to evaluate the durability of its effects. The integration of LKCM into community-based HIV support services should also be explored, particularly through the training of non-specialist facilitators to enhance scalability in low-resource settings. Researchers are encouraged to examine potential moderators—such as internalized stigma, social support, and spiritual coping—to better understand individual differences in treatment responsiveness. Additionally, adapting LKCM to culturally grounded formats may further strengthen its acceptability and relevance for people living with HIV in different sociocultural contexts.

## 5. Declarations

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### 5.2 Authors' Contribution

MRR conceptualized the study, designed the research framework, conducted data analysis, and led the manuscript writing process. KAP served as the research facilitator and supported the implementation of the intervention. AKI coordinated field data collection and managed participant recruitment and on-site research activities. All authors contributed to the manuscript review and approved the final version for submission.

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### 5.4 Conflict of Interest

The authors declare that there are no conflicts of interest associated with the publication of this manuscript.

### 5.5 Declaration of Generative AI in Scientific Writing

The authors acknowledge the use of generative AI tools, specifically DeepL, solely for English-language refinement and clarity during manuscript preparation. No AI tools were used to generate original ideas, analyze data, interpret results, or develop the scientific content of this study. The authors remain fully responsible for the accuracy, originality, and integrity of the final manuscript.

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