Quality of Life, Perceived Stigma, and Depression Among People Living with HIV/AIDS

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ABSTRACT

Background: The intersecting challenges of a growing population of people living with HIV/AIDS (PLWHA), efforts to improve their quality of life (QoL), and the ongoing persistence of stigma contribute to an increasing incidence of depression among PLWHA. Existing research presents conflicting evidence and seldom addresses the interplay between QoL, perceived stigma, and levels of depression. This study aims to fill that gap by examining the effects of QoL and perceived stigma on the depression levels of PLWHA.

Method: A cross-sectional study involving 97 PLWHA was conducted. The face-to-face measures included the WHOQOL-BREF, the Modified Berger HIV Stigma Scale, and Hamilton Depression Rating Scale (HDRS). An ordinal logistic regression model was employed to identify associations between QoL, perceived stigma, depression, and other potential predictor variables.

Result: Among the 97 PLWHA, the majority were male (55.7%), belonged to the early adult age group (39.2%), and had completed senior high school (53.6%). The QoL results indicated that 47.4% reported good QoL, while 52.6% reported poor QoL. Regarding perceived stigma, 50.5% felt not stigmatized, whereas 49.5% felt stigmatized. The levels of depression were categorized as follows: normal/not depressed (68%), mildly depressed (11.3%), moderately depressed (8.2%), severely depressed (6.2%), and very severely depressed (6.2%). This research underscores that QoL serves as a protective factor against depression and mitigates the negative effects of stigma on mental health, highlighting the urgent need for targeted interventions and holistic approaches.

INTRODUCTION

People living with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS), commonly referred to as PLWHA, are individuals who have contracted HIV. HIV remains a significant global health issue, having caused 42.3 million deaths since its discovery. In 2023 alone, an estimated 630,000 people died from HIV-related causes, while approximately 1.3 million individuals acquired the virus, bringing the total number of active cases to 39.9 million globally. This figure represents a 5.8% global increase from the 37.7 million cases reported in 2020. Notably, 65% of these cases are concentrated in the World Health Organization (WHO) African Region.[1]

By the end of 2023, Indonesia reported a cumulative total of 407,577 HIV cases, up from 367,401 cases, representing a rise of 10.93%. East Nusa Tenggara Province moved up to 11th place among Indonesia's 38 provinces for the highest number of new HIV cases, compared to 21st place out of 34 provinces at the beginning of 2022. The number of new cases in the province increased from 556 to 1,201 during this period.[2,3] Furthermore, statistics indicate that the cumulative number of AIDS cases in the province has reached 3,837, with 752 new cases reported. Kupang City ranks first among all districts in East Nusa Tenggara, recording 1,088 cases, a significant increase from 433 cases in 2022.[4–6]

With no complete cure for HIV, PLWHA must coexist with their condition indefinitely. PLWHA often face challenges including negativity, misunderstandings, stigma, and discrimination from others, in addition to experiencing symptoms that disrupt their quality of life (QoL). This situation can potentially lead to depression among individuals living with HIV/AIDS.[7]

Depression continues to be a significant global health issue, impacting approximately 3.8% of the world's population, which equates to around 280 million individuals. The prevalence of depression is approximately 50% higher in women than in men. Each year, over 700,000 people die by suicide, making it the fourth leading cause of death among individuals aged 15 to 29.[8] In Indonesia, findings from the 2023 Nation

Wide Survey reveal a 1.4% prevalence of depression, with East Nusa Tenggara ranking 19th at 1.1%.(9)

The repercussions of depression extend to various aspects of an individual's life, impacting social interactions, work, and other psychosocial dimensions. Furthermore, depression exacerbates morbidity and mortality associated with pre-existing health conditions.(8) The intersecting challenges of a growing population of PLWHA, efforts to improve their QoL, and the ongoing presence of stigma contribute to an increasing incidence of depression among this group. Research conducted in various regions highlights the complex interplay between QoL, stigma, and depression in PLWHA. In Brazil, 59.5% of PLWHA reported experiencing moderate to severe depression, which adversely affected their QoL, as evidenced by low QoL scores across the sample.(10) Research conducted in India indicated that a significant majority of PLWHA experienced inadequate social support (84.57%), low self-esteem (51.52%), and poor QoL (56.52%). Furthermore, social support and self-esteem were found to have a positive correlation with QoL.(11)

Research conducted in Bali found that logistic regression analysis indicated that stigma (p=0.029) and depression (p=0.014) significantly impacted the QoL of PLWHA. This effect persisted even after accounting for factors such as gender, occupational status, education, clinical stage, comorbidities, duration of the disease, living situation, and marital status. Despite these influences, only 35.8% of PLWHA reported experiencing a poor QoL.(12) In Solo, perceived stigma was positively correlated with depression; however, the majority of PLWHA (54.1%) did not experience depression.(13) Conversely, research in Aceh reported a high prevalence of depression (79.3%), indicating an inverse relationship between the severity of depression and QoL.(14) Another research in Jepara, identified significant associations between depression in PLWHA and various factors, including education, marital status, income, disease stage, and social support. However, no significant relationships were found concerning gender or age.(15) In addition, depression has been identified as a significant factor that reduces medication adherence among PLWHA.(16)

A study conducted in Uganda challenged conventional perceptions by suggesting that there is no significant difference in health and well-being between PLWHA and those without HIV. This finding indicates a complex relationship among these aspects.(17) Two studies on PLWHA in Ethiopia reported a high level of perceived stigma (69.5%) in Southern Ethiopia. In contrast, the majority of respondents in Western Ethiopia reported low perceived stigma (51.4%). However, both regions showed a correlation with depression.(18,19)

Research conducted in Kupang revealed that 56.0% of PLWHA experienced low levels of stigma, while 44.0% encountered high levels of stigma. The attitudes of community leaders were identified as the most significant determinant, increasing the likelihood of stigma by a factor of 4.834.(20) Other studies have highlighted that educational attainment, stigma, and social factors significantly impact the QoL of PLWHA.(21,22) Additionally, among PLWHA who do not experience stigma, 58% exhibited normal levels of depression, 54% reported above-normal levels of anxiety, and 73% demonstrated normal levels of stress. This suggests that the absence of stigma, along with strong family support, effectively reduces depression in PLWHA.(23)

Existing research presents conflicting evidence regarding the QoL and perceived stigma among PLWHA, often emphasizing other aspects of their mental health.(20–24) However, it seldom addresses the interplay between QoL and perceived stigma concerning levels of depression as the dependent variable. Therefore, we aim to fill this gap by examining how QoL and perceived stigma independently affect the levels of depression among PLWHA, while also providing comprehensive data on this topic.

METHOD

This research employed an observational analytic design with a cross-sectional approach conducted from May 15, 2023, to July 6, 2023, in Kupang, East Nusa Tenggara, Indonesia. A total of 97 participants who met the inclusion and exclusion criteria were selected through non-probability snowball sampling. The inclusion criteria comprised PLWHA in Kupang City or those receiving antiretroviral therapy (ART) at Prof. Dr. W.Z. Johannes Regional Hospital or Wirasakti Hospital Kupang, aged 18 years or older, proficient in the Indonesian language, capable of following instructions, and providing informed consent. The exclusion criteria included PLWHA with medical conditions that hindered their ability to respond to the questionnaire.

The independent variables in this study include QoL and perceived stigma, along with sample characteristics such as gender, age, and education level. The dependent variable is the depression level of PLWHA. To assess QoL, the World Health Organization Quality of Life (WHOQOL)-BREF questionnaire was utilized, which consists of 26 questions. Stigma was measured using the 40-question Berger HIV Stigma Scale, which was modified into a 25-question format. Both interpretations were conducted using established research cutoff points. The level of depression among participants was assessed using the Hamilton Depression Rating Scale (HDRS),

which comprises 17 questions, with scores ranging from 0 to 53. Interpretation of the scores is as follows: 0-7 (normal), 8-13 (mild), 14-18 (moderate), 19-22 (severe), ≥23 (very severe).

The analysis was conducted using univariate and ordinal logistic regression techniques. All statistical tests were deemed significant if the p-value was less than 0.05. The Ethical Clearance Commission of the Faculty of Medicine and Veterinary Medicine at Nusa Cendana University granted ethical clearance for this research under approval number 14/UN15.16/KEPK/2023.

RESULT AND DISCUSSION

Table 1. Demographic characteristics and distribution of quality of life, perceived stigma, and levels of depression among samples.

Variables	n	%
Gender		
Female	43	44.3
Male	54	55.7
Age		
Late adolescence (17-25 years old)	19	19.6
Early adult (26-35 years old)	38	39.2
Late adult (36-45 years old)	32	33
Early elderly (46-55 years old)	8	8.2
Education attainment		
Not completed elementary school	2	2.1
Elementary School	5	5.2
Junior High School	16	16.5
Senior High School	52	53.6
Bachelor's Degree	22	22.7
Quality of Life		
Poor	51	52.6
Good	46	47.4
Perceived stigma		
Not stigmatized	49	50.5
Stigmatized	48	49.5
Level of depression		
Normal/not depressed	66	68
Mild depression	11	11.3
Moderate depression	8	8.2
Severe depression	6	6.2
Very severe depression	6	6.2
Total	**97**	**100**

Based on Table 1, the majority of the samples were male (55.7%), belonged to the early adult age group (39.2%), and had completed high school (53.6%). Additionally, Table 1 indicates that most of the samples reported a poor QoL (52.6%), were not stigmatized (50.5%), and exhibited a normal level of depression or not depressed (68%).

Based on Table 1, among the 97 samples of PLWHA, males outnumbered females, particularly in the 26-45 age group. This observation is consistent with a report from Indonesia, which indicated that 71% of PLWHA were male, with the predominant age range being 25-49 years (64%), representing the productive age group.(2) This distribution is similar to findings from Vietnam, India, and Turkey, where most samples consisted of men within the productive age range.(14,25–27)

This is attributed to factors such as occupational risks, higher rates of drug abuse, and involvement in unsafe or homosexual relationships, which are more prevalent among males and represent the highest risk factors for HIV. Additionally, individuals in the productive age group typically possess the skills necessary for various activities, including work and socializing, along with active sexual lives, which increases their susceptibility to HIV.(2,28)

Regarding educational attainment, the majority of PLWHA in the sample were predominantly high school graduates (53.6%). This contrasts with a study conducted in Southern Ethiopia, where the majority of participants had completed junior high school (40.5%).(19) This variation can be attributed to the sample collection in Kupang, where the majority of participants have a senior high school education level (34%).(5)

Table 2 illustrates that the logistic regression analysis revealed that QoL and perceived stigma significantly influenced the level of depression among PLWHA, with p-values of 0.002 (odds ratio [OR] = 0.193) and 0.031 (OR = 2.787), respectively, at a 95% confidence interval (CI). These results suggest that PLWHA with a higher QoL have 0.193 times the odds of experiencing elevated levels of depression compared to those with lower QoL, indicating that QoL serves as a protective factor against depression. Conversely, PLWHA who score higher on perceived stigma is 2.787 times more likely to experience higher levels of depression, highlighting perceived stigma as a risk factor for depression.

The multivariate analysis presented in Table 2 demonstrates a significant relationship between poor QoL and higher rates of depression among PLWHA, with QoL serving as a protective factor against depression. This finding is consistent with research conducted in Vietnam and India, which also indicated that PLWHA with lower QoL are more likely to experience elevated levels of depression (25,26) This similarity in outcomes may be attributed to the comparably poor QoL observed within the sample populations, as detailed in Table 1.

Table 2. Multivariate Analysis of factors associated with the level of depression in People Living with HIV/AIDS (PLWHA).

Variables	B	Wald	p-value	OR (CI 95%)
Gender	0.286	0.322	0.570	1.331 (0.496-3.571)
Age	-0.312	1.328	0.249	0.732 (0.431-1.244)
Education attainment	-0.320	1.966	0.161	0.726 (0.464-1.136)
Quality of Life	-1.643	9.938	0.002	0.193 (0.070-0.537)
Perceived stigma	1.025	4.656	0.031	2.787 (1.098-7.069)

In contrast, research from Aceh and Bali, Indonesia, indicates that a substantial majority of PLWHA report a good QoL, with rates of 89.65% and 64.2%, respectively. Nevertheless, the correlation between QoL and depression remains consistent.(12,14) This suggests that, despite geographical and cultural differences, the protective effect of QoL against depression in PLWHA is a widespread phenomenon.

Variations in QoL can be attributed to a range of factors, including physical, emotional, and social influences. Physical factors involve the management of HIV symptoms and overall health, while emotional factors pertain to mental health challenges and stress. Social aspects include support systems, stigma, and social integration.(11,29)

An individual's QoL is closely linked to their mental health. The average age of the research samples, which represents a productive stage of life, may influence QoL, as the body's overall biological functions typically decline with age. Poor QoL among PLWHA can lead to depression, particularly due to social disconnection and HIV-related challenges, such as psychosocial dysfunction, weakened immune systems, and concerns about mortality. Additionally, PLWHA often experiences heightened depressive symptoms upon receiving an initial HIV diagnosis, as this can be a traumatic event and a significant source of stress.(19,30)

The multivariate analysis presented in Table 2 demonstrates a significant relationship between higher levels of perceived stigma and increased rates of depression among PLWHA, identifying perceived stigma as a risk factor for depression. Similar findings have been reported in studies from Western Ethiopia, Southern Ethiopia, and Pematangsiantar, where stigmatized PLWHA exhibit a higher risk of depression.(18,19,31) This observation is particularly noteworthy given the contrasting levels of perceived stigma; the research sample in Southern Ethiopia predominantly reported high levels of perceived stigma (69.5%), while the majority in Western Ethiopia and Pematangsiantar reported low levels of perceived stigma at 51.4% and 59.4%, respectively, as shown in Table 1.

These variations may stem from sociodemographic differences and the utilization of various questionnaires, which can influence data interpretation. For example, the Five-Point HIV Stigma Scale was employed in Southern Ethiopia, the Nine-Question Perceived Stigma Measure in Western Ethiopia, the Explanatory Model Interview Catalogue Community Stigma Scale in Pematangsiantar, and the Modified Berger HIV Stigma Scale in this research. This highlights the complex interactions between stigma and mental health and emphasizes its widespread impact, irrespective of prevalence.

Differences in how PLWHA perceive stigma can also be understood through the support they receive from others and their own acceptance of their condition. When PLWHA experience high levels of social support and self-acceptance, they tend to feel less stigmatized.(18,24) The fear of societal judgment due to HIV significantly contributes to an increased perception of stigma.

Stigma is fundamentally linked to depression, as individuals with HIV are often perceived as immoral or unsafe. This perception reflects societal beliefs that contribute to the discrimination and exclusion of PLWHA from social activities, employment, education, and access to healthcare. Ultimately, these factors can directly lead to depression.(32)

Moreover, the level of stigma experienced by individuals in the sample can directly impact their QoL. For instance, stigma can result in discrimination against PLWHA, which may reduce their willingness to seek treatment and lead to poor adherence to ART. This, in turn, can exacerbate their symptoms and ultimately diminish their QoL. When stigma negatively affects QoL, and QoL is closely linked to depression, both factors can concurrently worsen the mental health of PLWHA, contributing to increased levels of depression.

Depression is a complex condition influenced by various factors, including gender, age, genetics, socioeconomic status, and health conditions. For PLWHA, the situation is further complicated by factors such as their symptoms, perceived stigma, social support, adherence to ART, side effects of ART, and overall QoL.(33) This complexity is the theoretical framework of the research.

We acknowledge that our study has certain limitations. Two notable limitations are its cross-sectional design and the failure to account for other potential risk

factors for depression in PLWHA, such as levels of social support, adherence to ART, and side effects of ART. To gain a more comprehensive understanding, further research that specifically focuses on these factors is essential.

CONCLUSION

Our findings emphasize the critical need to address not only the medical conditions of PLWHA but also the psychosocial factors that contribute to their overall well-being and the burden of depression. Firstly, the link between poor QoL and higher rates of depression highlights the importance of assessing and improving QoL as a means to mitigate depression among PLWHA. Additionally, the significant correlation between perceived stigma and depression underscores the essential role of reducing stigma through social support, which can potentially enhance both QoL and mental health outcomes. Furthermore, recognizing the intricate interplay between QoL, stigma, and depression underscores the necessity for targeted interventions and holistic approaches that take individual sociodemographic factors into account to effectively support mental health in PLWHA.

Addressing the multifaceted challenges of HIV/AIDS necessitates an integrated approach that encompasses primary, secondary, and tertiary prevention strategies. Primary prevention aims to reduce HIV transmission through education, safe sex practices, and harm reduction programs, often summarized by Abstinence, Be Faithful, Condom use, Drug avoidance, and Education. Secondary prevention focuses on early detection and treatment, including routine HIV testing and immediate access to ART. Tertiary prevention seeks to enhance the QoL for PLWHA by addressing both physical and mental health needs, reducing stigma, and providing social support. Collectively, these strategies aim to alleviate the burden of HIV/AIDS and improve overall health outcomes.

To enhance these preventive efforts, targeted programs for managing both physical and mental health are essential, particularly for individuals in the productive age group, as they can significantly improve QoL and serve as a protective factor against depression. Comprehensive stigma reduction campaigns, supported by social networks, are equally crucial for promoting inclusivity and alleviating the psychological burden associated with stigma-induced depression. In addition, community-based psychosocial interventions, such as counselling and economic empowerment programs, can further bolster the psychological well-being and independence of PLWHA. These initiatives should be complemented by policy advocacy for anti-discrimination laws and stigma-free healthcare services.

Finally, ongoing research and evaluation are essential for understanding the risk factors associated with depression and for assessing the effectiveness of health promotion programs that have been implemented. By integrating education, stigma reduction, psychosocial interventions, policy advocacy, and research, a supportive environment can be fostered to address the medical, psychosocial, and structural needs of PLWHA. This comprehensive approach is anticipated to significantly improve their QoL, reduce the prevalence of depression, and sustain positive health outcomes within the community.

Acknowledgment

Conflict of Interest
No relevant disclosures

REFERENCES
1. World Health Organization. HIV/AIDS [Internet]. 2024. Available from: https://www.who.int/news-room/fact-sheets/detail/hiv-aids
2. Kementerian Kesehatan Republik Indonesia. Laporan Eksekutif Perkembangan HIV AIDS & Penyakit lnfeksi Menular Seksual (PIMS) Tahun 2023. 2023; Available from: https://siha.kemkes.go.id/portal/files_upload/Laporan_2023.pdf
3. Kementerian Kesehatan Republik Indonesia. Laporan Eksekutif Perkembangan HIV AIDS & Penyakit lnfeksi Menular Seksual (PIMS) Triwulan IV Tahun 2022. 2022 [Internet]. Available from: https://siha.kemkes.go.id/portal/files_upload/Laporan_TW_3_2022.pdf
4. Badan Pusat Statistik Provinsi Nusa Tenggara Timur. Provinsi Nusa Tenggara Timur Dalam Angka 2022 [Internet]. 2022. Available from: https://ntt.bps.go.id/id/publication/2022/02/25/cc3b48ec498e16518636e415/provinsi-nusa-tenggara-timur-dalam-angka-2022.html
5. Badan Pusat Statistik Provinsi Nusa Tenggara Timur. Provinsi Nusa Tenggara Timur dalam Angka 2024 [Internet]. 2024. Available from: https://ntt.bps.go.id/id/publication/2024/02/28/56eb9d4253a9d35283615899/provinsi-nusa-tenggara-timur-dalam-angka-2024.html
6. Badan Pusat Statistik Provinsi Nusa Tenggara Timur. Jumlah Kasus Penyakit Menurut

Kabupaten/Kota dan Jenis Penyakit (Jiwa) [Internet]. 2024. Available from: https://ntt.bps.go.id/id/statistics-table/2/MTQ4NSMy/jumlah-kasus-penyakit-menurut-kabupaten-kota-dan-jenis-penyakit.html

7. Centers for Disease Control and Prevention. HIV [Internet]. Centers for Disease Control and Prevention. 2024. Available from: https://www.cdc.gov/hiv/index.html

8. Lee Y, Lin P-Y, Huang Y-C, Chiu N-M, Hung C-F, Wang L-J. The Morbidity and Associated Factors of Depression in Caregivers of Patients with Depressive Disorder. Neuropsychiatr Dis Treat [Internet]. 2023 Aug;Volume 19:1853–64. Available from: https://www.dovepress.com/the-morbidity-and-associated-factors-of-depression-in-caregivers-of-pa-peer-reviewed-fulltext-article-NDT

9. Kementerian Kesehatan Republik Indonesia. Survei Kesehatan Indonesia (SKI) 2023 dalam Angka [Internet]. Vol. 01. 2023. Available from: https://www.badankebijakan.kemkes.go.id/hasil-ski-2023/

10. Betancur MN, Lins L, Oliveira IR de, Brites C. Quality of Life, Anxiety and Depression in Patients with HIV/AIDS who Present Poor Adherence to Antiretroviral Therapy: A Cross-Sectional Study in Salvador, Brazil. Brazilian J Infect Dis. 2017;21(5):507–14.

11. Wani MA. Social support, self-esteem and quality of life among people living with HIV/AIDS in Jammu & Kashmir India. An Psicol. 2020;36(2):232–41.

12. Pendet NMDP, Yona S, Yulia. Depression, Stigma, and Quality Of Life among Elderly with HIV/AIDS in Bali. Babali Nurs Res. 2020;1(3):100–11.

13. Elisha J, Yuliadi I, Sjarifah I. Hubungan Perceived Stigma dengan Tingkat Depresi pada Orang dengan HIV/AIDS di Kelompok Dukungan Sebaya Solo Plus Kota Surakarta. Plex Med J. 2022;1(5):166–71.

14. Siregar ML, Abdullah V, Mamfaluti T. Correlation of Depression and Quality of Life in HIV/AIDS Patients. IOP Conf Ser Earth Environ Sci. 2018;125(1).

15. Pujiati E, Icca N. Faktor-Faktor Yang Berhubungan Dengan Kejadian Depresi Pada Penderita Hiv/Aids (Odha). J Profesi Keperawatan. 2021;8(2):163–78.

16. Putri A, Fitri LDN. Hubungan Tingkat Depresi dengan Kepatuhan Minum Obat pada ODHA di Puskesmas Temindung Samarinda. Borneo Student Res. 2021;2(2):818–26.

17. Reynolds Z, Gilbert R, Sentongo R, Meyer AC, Saylor D, Okello S, et al. Examining the Associations Between HIV-Related Stigma and Health Outcomes in People Living with HIV/AIDS: A Series of Meta-Analyses. J Int AIDS Soc. 2022;25(S4):97–104.

18. Turi E, Simegnew D, Fekadu G, Tolossa T, Desalegn M, Bayisa L, et al. High Perceived Stigma among People Living with HIV/AIDS in a Resource Limited Setting in Western Ethiopia: The Effect of Depression and Low Social Support. HIV/AIDS - Res Palliat Care. 2021;13:389–97.

19. Beyamo A, Bashe T, Facha W, Moshago T. Depression and Associated Factors Among Adult Hiv/Aids Patients Attending Antiretroviral Therapy At Wolaita Sodo University Teaching and Referral Hospital, Southern Ethiopia. HIV/AIDS - Res Palliat Care. 2020;12:707–15.

20. Konstantinus H, Shaluhiyah Z, Suryoputro A. Stigma Masyarakat terhadap ODHA di Kota Kupang Provinsi NTT. J Promosi Kesehat Indones. 2017;12(1):62–7.

21. Handayani F, Dewi FST. Faktor yang Mempengaruhi Kualitas Hidup Orang dengan HIV/AIDS (ODHA) di Kota Kupang. Ber Kedokt Masy. 2017;33(11):509.

22. Zainudin H, Meo MLN, Tanaem N. Faktor-Faktor yang Mempengaruhi Kualitas Hidup Orang dengan HIV/AIDS (ODHA) di LSM Perjuangan Kupang. Keperawatan stikes citra husada mandiri kupang. 2018;03:16–8.

23. Soan TLC, Ndoen HI, Landi S. Overview of Depression, Anxiety and Stress Levels of PLWHA. J Heal Behav Sci. 2023;4(4):610–8.

24. Didi A, Manurung IFE, Sir AB. Pengetahuan dan Stigma Keluarga ODHA terhadap Orang yang Terinfeksi HIV dan AIDS di Kota Kupang. J Heal Behav Sci. 2020;2(1):10–7.

25. Tran BX, Dang AK, Truong NT, Ha GH, Nguyen HLT, Do HN, et al. Depression and Quality of Life among Patients Living with HIV/AIDS in the Era of Universal Treatment Access in Vietnam. Int J Environ Res Public Health. 2018;15(12):1–14.

26. Deshmukh NN, Borkar AM, Deshmukh JS. Depression and Its Associated Factors Among People Living with HIV/AIDS: Can It Affect Their Quality of Life? J Fam Med Prim Care. 2017;6(3):549.

27. Demirel OF, Mayda PY, Yıldız N, Sağlam H, Koçak BT, Habip Z, et al. Self-Stigma, Depression, and Anxiety Levels of People Living with HIV in Turkey. Eur J Psychiatry.

2018;32(4):182–6.

28. Qiao Y chao, Xu Y, Jiang D xiang, Wang X, Wang F, Yang J, et al. Epidemiological Analyses of Regional and Age Differences of HIV/AIDS Prevalence in China, 2004–2016. Int J Infect Dis. 2019;81:215–20.

29. Daundasekara SS, Arlinghaus KR, Johnston CA. Quality of Life: The Primary Goal of Lifestyle Intervention. Am J Lifestyle Med. 2020;14(3):267–70.

30. Karkashadze E, Gates MA, Chkhartishvili N, DeHovitz J, Tsertsvadze T. Assessment of quality of life in people living with HIV in Georgia. Int J STD AIDS. 2017;28(7):672–8.

31. Mariany BS, Asfriyati, Sanusi SR. Stigma, Depresi, dan Kualitas Hidup Penderita HIV : Studi pada Komunitas "Lelaki Seks dengan Lelaki" di Pematangsiantar. BKM J Community Med Public Heal. 2019;35(4):139–46.

32. Wedajo S, Degu G, Deribew A, Ambaw F. Social Support, Perceived Stigma, and Depression among PLHIV on Second-Line Antiretroviral Therapy using Structural Equation Modeling in a Multicenter Study in Northeast Ethiopia. Int J Ment Health Syst. 2022;16(1):1–10.

33. Mendonca CJ, Newton-John TRO, Alperstein DM, Begley K, Hennessy RM, Bulsara SM. Quality of Life of People Living with HIV in Australia: The Role of Stigma, Social Disconnection and Mental Health. AIDS Behav. 2022; 47:545-57.