Jurnal Persatuan Perawat Nasional Indonesia
Journal of Indonesian National Nurses Association
P-ISSN: 2503-1376 E-ISSN: 2549-8576

Perceived the Impact of the COVID-19 Pandemic on Women Living with Human Immunodeficiency Virus in Indonesia: A Qualitative Descriptive Study

Rita Ismail[1], Sri Yona[2], Elly Nurachmah[2], Kathleen Norr[3], Joachim Voss[4]

[1]School of Nursing, Faculty of Health Sciences,
Universitas Pembangunan Nasional "Veteran" Jakarta,
Jln. Raya Limo, Kec. Limo, Kota Depok, West Java, 16515, Indonesia
[2]Department Medical Surgical Nursing, Faculty of Nursing, Universitas Indonesia,
Jln. Prof. Dr. Bahder Djohan, Kampus UI Depok, Pondok Cina, Depok,
West Java, 16424, Indonesia
[3]College of Nursing, University of Illinois Chicago,
Children's Wisconsin Corporate Center 999 N 92nd St. Wauwatosa,
Milwaukee, Wisconsin, 53226, United States of America
[4]College of Nursing University of Nebraska Medical Center,
4111 Dewey Avenue 985330 Nebraska Medical Center, Omaha, Nebraska,
68198-5330 United States of America

Corresponding Author: Rita Ismail | Email: ismailr@upnvj.ac.id | ORCID: 0000-0002-9541-418X

Corresponding author
Rita Ismail
School of Nursing, Faculty of Health Sciences, Universitas Pembangunan Nasional "Veteran" Jakarta, Indonesia
Email:
ismailr@upnvj.ac.id

Received:
28 May 2026

Revised:
19 June 2026

Accepted:
21 July 2026

Keywords:
Adherence, COVID-19 pandemic, Indonesia, women living with HIV

ABSTRACT

Background
The COVID-19 pandemic in Indonesia has greatly affected women living with HIV (WLWH).

Objective
This study explored the impact of the COVID-19 pandemic on WLWH.

Methods
The study design was qualitative descriptive. A total of 11 WLWH participated in the study. Data collection was conducted in four cities in Indonesia including Tangerang, Jakarta, Mojokerto, and Samarinda. Semi-structured interviews with WLWH who actively received antiretroviral therapy (ART) for at least 6 months prior to the pandemic were conducted via telephone and face to face. Data were analyzed using content analysis.

Results
Most of them were 35-45 years old, married, completed high school, and housewives. Five themes emerged including perceived vulnerability to infection and adaptive ART adherence;

DOI:
http://dx.doi.org/10.32419/jppni.v11i2.969

the economic impacts of the pandemic; spousal and peer support for ART continuity; impact on daily life and well-being; resilience through faith and acceptance of "takdir" (God and Destiny).

Conclusion

Despite socioeconomic and psychosocial challenges, participants described maintaining ART continuity through adaptive clinic procedures, personal routines, spousal or peer support, and religious coping. These findings suggest that flexible, culturally sensitive, and family-aware nursing approaches may help support WLWH during future healthcare disruptions

Background

The Coronavirus Disease 2019 (COVID-19) pandemic and subsequent national shutdowns introduced devastating public health and socioeconomic disruptions worldwide (Joffe, 2021; World Health Organization/WHO, 2023). During this global crisis, pre-existing inequalities were exacerbated, disproportionately impacting highly vulnerable populations. Among these, women living with Human Immunodeficiency Virus (WLWH) faced compound vulnerabilities due to chronic health needs, underlying psychosocial distress, high levels of social stress, and structurally compromised support systems (Mokaddam *et al*., 2025; Montgomerie *et al.,* 2023; Zeleke *et al*., 2024). Psychosocial burdens, such as depression, are historically associated with lower adherence to antiretroviral therapy (ART), directly undermining the overall quality of life for WLWH (Zeleke *et al*., 2024). Consequently, healthcare providers are required to play a crucial role in mitigating these barriers and supporting treatment continuity during periods of societal disruption (Mokaddam *et al*., 2025).

Indonesia provides a critical context for examining the intersection of Human Immunodeficiency virus (HIV) care and public health emergencies. The country experienced severe pandemic waves, recording over 6.6 million infections and 159,524 deaths, which severely strained the healthcare system, national economy, and daily welfare (WHO, 2023). Based on the Joint United Nations Programme on HIV/AIDS (UNAIDS), independent of the pandemic, HIV remains a major national health challenge; over half a million individuals live with HIV in Indonesia, yet only 31% receive ART, falling substantially below the global average of 76% (UNAIDS, 2025). This stark treatment gap is fueled by widespread social stigma and pervasive discrimination. While recent literature has documented pandemic-related disruptions among individuals practicing high-risk behaviors (Mahendradhata *et al*., 2021; Tambunan, 2021), there remains a critical gap in understanding the unique experiences of WLWH who are not currently identified as key populations or engaging in high-risk behaviors (Fauk *et al*., 2021). Many in this group are housewives or informal workers who face distinct socioeconomic barriers and gendered expectations. Investigating how this specific, understudied cohort managed treatment continuity provides essential insights for resilient, humanistic nursing interventions.

When the pandemic began in Indonesia in March, 2020, quickly followed by a national lockdown, people living with HIV (PLWH) were frightened about their heightened risk of COVID-19, risk of exposure, especially when going to the clinic to obtain their ART, and

disruptions and delays in the ART supply (Fauk *et al.,* 2023; Sukmaningrum *et al*., 2024; Suryana *et al*., 2022). The impact of the COVID-19 pandemic has been devastating. Most people with HIV experienced substantial economic difficulties, including job losses, reduced hours, the collapse of lively markets, and tourism, which depend on their livelihoods, transportation disruptions, and increased costs (Fauk *et al*., 2023; Sukmaningrum *et al*., 2024; Suryana *et al*., 2022). Daily life was lonelier, more stressful, and boring, and many women experienced greater mental distress (Karjadi *et al*., 2021; Najmah *et al.,* 2021; Sukmaningrum *et al*., 2024). Starting as early as April 2020, a new policy changed within the high incident area of COVID-19 simplified adherence to long-term medications, with fewer provider visits and a 90-day medication supply at each visit (Karjadi *et al*., 2021). Before the COVID-19 pandemic, PLWH only received a 30-day medication supply after each visit at the providers office. However, several qualitative studies in Indonesia did not identify universal improved access to ARTs or health system changes that made adherence easier (Fauk *et al*., 2023; Najmah *et al*., 2021; Suryana *et al*., 2022). These studies suggested that not all people with HIV throughout Indonesia could benefit from the policies to remain adherent.

Sukmaningrum *et al*. (2024) provided a more comprehensive picture focusing on PLWH who practiced high risk behaviours. They reported the overall disruption of life: maintaining health as people with HIV, fear of infection and loss of loved ones, financial worry, transportation difficulties, loneliness, and uncertainty about the future (Sukmaningrum *et al.,* 2024). Two studies noted that despite these negative impacts, social support from family and friends as well as personal resilience helped participants cope with the many stressors they experienced (Fauk *et al*., 2023; Sukmaningrum *et al*., 2024). The overall impact of these negative factors combined exacerbated the structural inequalities that affected WLWH even prior to the pandemic in Indonesia. Most of the studies in Indonesia focused on high-risk groups and more information was needed from WLWH not currently identified as key populations or engaging in high-risk behaviours.

Tangerang, Jakarta, Mojokerto, and Samarinda are cities in Indonesia with diverse demographic, socioeconomic, and healthcare characteristics. These cities represent western, central, and eastern regions of the country and have established HIV treatment services, including ART clinics at referral hospitals and primary healthcare centers (Ministry of Health of the Republic of Indonesia, 2025). Jakarta and Tangerang are part of highly urbanized metropolitan areas with relatively high dense HIV burdens due to populations, high population mobility, and the concentration of key populations at increased risk of HIV acquisition (UNAIDS, 2024; Januraga *et al.,* 2025). In contrast, Mojokerto and Samarinda represent medium-sized cities where HIV services have expanded in response to the increasing number of people living with HIV receiving lifelong ART (Ministry of Health of the Republic of Indonesia, 2025). Including these four cities enabled the study to capture diverse experiences among women living with HIV (WLWH) across different healthcare settings and sociocultural contexts in Indonesia. To our knowledge, no prior study had specifically examined WLWH who are not identified with high-risk groups within these four locations, underscoring the urgency of the present study in generating context-specific evidence to inform culturally responsive nursing practice and policy in these understudied regions.

Nurses play a central role in supporting WLWH, particularly during public health crises such as the COVID-19 pandemic. Beyond providing clinical care, nurses often become the first point of emotional, psychosocial, and educational support for WLWH who experience stigma, fear, and uncertainty related to both HIV and COVID-19. In many low- and middle-income countries, including Indonesia, nurses also act as care coordinators who help patients maintain continuity of antiretroviral therapy (ART), navigate healthcare services, and strengthen adherence behaviors despite major disruptions in health systems (Nyoni & Okumu, 2020). Previous studies have shown that compassionate communication, phone-based follow-up, peer support facilitation, and

family-centered approaches implemented by nurses contributed to improved ART adherence and emotional resilience among people living with HIV (Ismail *et al*., 2023; Yona *et al*., 2025). The purpose of this qualitative study was to explore the impact of the COVID-19 pandemic on WLWH. Understanding the impact of the COVID-19 pandemic on WLWH is essential for developing nursing interventions that are responsive, culturally sensitive, and sustainable in future public health emergencies.

Methods

This qualitative descriptive design used semi-structured individual interviews to explore the impact of the COVID-19 pandemic on WLWH. This design is particularly suited for obtaining unadorned, rich descriptions of phenomena directly from the participants' perspectives. The study is reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines to ensure transparency and methodological rigor (Tong, Sainsbury, & Craig, 2007). Data were collected in 2022 across four cities in Indonesia, purposively selected to capture geographic and socio-demographic variation in the pandemic's impact on WLWH: Tangerang (a low-income urban area near Jakarta), Jakarta (the high-density capital city with the strictest lockdown enforcement), Mojokerto (a less densely populated provincial town in East Java), and Samarinda (a city located in East Kalimantan).

Purposive sampling was used to recruit participants. The inclusion criteria were biologically female, diagnosed with HIV, aged ≥ 17 years (the legal age of adult consent in Indonesia), and actively receiving ART for at least 6 months prior to the pandemic. Exclusion criteria included individuals experiencing severe cognitive impairment or those unable to participate in telephone or face-to-face interviews. The sample size and adequacy were determined using the principle of information power, where the depth, specificity, and focused aims of the dialogue yielded sufficient conceptual richness to address the research objectives without requiring a larger sample (Malterud, Siersma, & Guassora, 2016).

Recruitment followed a rigorous two-step protocol coordinated with a designated Partner-in-Charge (PIC), defined here as the local NGO coordinators and clinic nurses working directly within the regional HIV care networks. First, the PIC personnel introduced the study to eligible WLWH with whom they had established clinical rapport, mitigated initial mistrust while acknowledged potential selection biases (as the sample consists of individuals actively retained in care). Interested individuals gave permission for their contact details to be shared with the principal investigator (PI), who then called them to explain the study, verify eligibility, and address privacy concerns.

Semi-structured individual interviews were conducted in 2022 by the PI, a female academic nurse trained in qualitative study. The PI maintained a reflexive stance, recognizing that her background as an academic could position her as an "outsider," which she balanced by partnering with trusted local NGO staff to build rapport. One interview in Jakarta was conducted face-to-face in a private room at the NGO office, while the remaining ten were conducted via telephone due to geographical distances and participants' preferences. Telephone interviews were conducted while ensuring the participants were in a quiet, private space. Interviews lasted between 45 and 75 minutes, were conducted in Bahasa Indonesia, and were transcribed verbatim. As a token of appreciation for their time and cell data usage, participants received a mobile phone credit voucher worth approximately IDR 100,000 (equivalent to $7 USD).

Given that data collection occurred in 2022, the temporal boundary between "during" and "after" the pandemic was clearly delineated during the interviews: "during the pandemic" referred explicitly to the period of strict lockdowns and peak transmission (2020–2021), whereas "after the pandemic" referred to the operational easing of restrictions and transition toward normalization in late 2021 and 2022. The interview guide relied on the following English-translated probe structures:

- *Can you describe your overall experience of living with HIV during the strict lockdown periods compared to the post-restriction phase?*
- *What specific challenges did you face regarding accessing and adhering to your ART regimen during the pandemic?*
- *What strategies or resources helped you maintain your daily medication routines?*
- *What lessons did you learn from the pandemic regarding your health and treatment adherence?*

In this study, adherence is operationally defined as uninterrupted medication continuity, meaning participants did not experience clinical treatment failure, missed doses for consecutive days, or total treatment cessation, despite encountering structural delays in refilling prescriptions. Prior to data collection, no official pilot interviews were carried out. Based on the study's goals, a thorough analysis of pertinent literature, and discussions among the research team, all of whom have expertise in qualitative research and HIV care, the semi-structured interview guide was created. While adhering to the interview outline, the interviewers employed pertinent probing questions to elucidate participants' answers and investigate new concerns during the data gathering procedure. Data were analyzed using inductive content analysis (Hsieh & Shannon, 2005). Transcripts were read repeatedly by a team of four researchers to achieve immersion. Open coding was conducted manually; codes were then grouped into categories and abstracted into conceptual themes through weekly consensus meetings. Coding disagreements were discussed during regular team meetings. Consensus was reached through discussion, and when disagreement remained, the senior qualitative researcher made the final decision after reviewing the original transcript. Trustworthiness was established through multiple strategies:

- Credibility: Achieved via investigator triangulation, where four researchers independently coded and cross-verified themes. During interviews, investigators did not observe the participant's condition or expression because almost all the interviews were conducted using telephone.
- Dependability: Maintained through a detailed audit trail documenting raw notes, coding structures, and category development decisions.
- Confirmability: Managed via reflexive journaling to limit subjective bias.
- Transferability: Facilitated by providing thick descriptions of the four regional settings, presented in the Methods (site characteristics) and Results (Characteristics of the Participants) sections. Member checking was not conducted because many participants requested minimal re-contact after the interviews to preserve confidentiality. Credibility was instead enhanced through investigator triangulation and audit trail. Data saturation was achieved after the eleventh interview because no new codes or conceptual categories emerged during the final interviews. Recruitment was therefore discontinued.

Table 1. The Analytic Process

Participant Quotation	Initial Code	Category	Theme
"M*y husband helps me to take my ART*"	Husband collected ART	Family support	Spousal and peer support for ART continuity
" *I used double masks during the pandemic and brought hand sanitizer with me. We try our best. The result is lillahi ta'ala"*	Religious coping	Faith and resilience	Resilience through faith

Quotations were translated from Bahasa Indonesia into English by the first author, who is bilingual in Bahasa Indonesia and English and experienced in qualitative HIV research. A second bilingual researcher independently reviewed the translated quotations to ensure semantic equivalence. The example of the analytic process from quote, code, category, and theme can be seen in table 1. Institutional review and ethical approval were granted by the Committee on Human Research of the Faculty of Nursing, Universitas Indonesia (No: KET-97/UN2.F12.D1.2.1/PPM.00.02/2022). Verbal informed consent was formally audio-recorded before any data collection began. To maintain strict confidentiality, all identifiers were removed, and pseudonyms were assigned to transcripts and data storage files.

Results

Participants were drawn from four socio-demographically distinct settings: Tangerang, a low-income urban area near Jakarta; Jakarta, the high-density capital city with the strictest lockdown enforcement; Mojokerto, a less densely populated provincial town in East Java; and Samarinda, a city in East Kalimantan. These varied contexts shaped participants' access to healthcare services, economic opportunities, and social support during the pandemic, and are reflected in the sociodemographic and experiential findings presented below.

Characteristics of the Participants

Table 2. Demographic characteristics of participants (n = 11)

Characteristics	n (%)
Age (years)	
25-34	2 (18.18)
35-45	8 (72.73)
>45	1 (9.09)
Marital Status	
Single	3 (27.27)
Married	7 (63.64)
Divorced/Widowed	1 (9.09)
Education	
Junior high school or less	3 (27.27)
Senior high school/ vocational	7 (63.64)
Diploma/undergraduate	1 (9.09)
Job before the pandemic	
Housewife	6 (54.55)
Homemaker	2 (18.18)
Self employed	3 (27.27)
Religion	
Islam	11 (100)
Ethnicity	
Javanese	9 (81.81)
Others	2 (18.18)

The total participants were 11 WLWH (1 from Tangerang, 1 from Jakarta, 6 from Mojokerto, and 3 from Samarinda). Most participants were 35-45 years old and married. The majority of them had completed high school and their economic activities during the pandemic were diverse. Six described themselves as housewives, two as homemakers, and three as self-employed, typically in small businesses such as food vendors or tailors. Indonesia was a predominantly Muslim country, all participants stated that they were Muslim. Almost all participants were Javanese (Table 2).

Themes

Five major themes emerged from the inductive analysis: perceived vulnerability to infection and adaptive ART Adherence; the economic impacts of the pandemic; spousal and peer support for ART continuity; impact on daily life and well-being; resilience through faith and acceptance of "takdir" (God and Destiny). The theme, subthemes, and core conceptual focus of the study results are described in table 3.

Table 3. Core Conceptual Focus, Subthemes, and Theme of the Study Results

Core Conceptual Focus	Subthemes	Themes
Clinical adaptation and operational definition of continuous treatment adherence.	• Fear of co-infection • Healthcare system flexibility	Perceived Vulnerability to Infection and Adaptive ART Adherence
Severe financial instability impacting household survival and travel capability.	• Household income loss • Informal sector disruptions	Economic Precarity and Adaptive Livelihoods
Spousal support as a mediator for medication adherence versus unique challenges of single/widowed WLWH.	• Marital care buffering • Isolation among non-married cohorts	Relational Support as a Buffer for Treatment Continuity
High distress stems from personal loss and continuous ambient anxiety.	• Fear of infection • Community bereavement	Psychosocial Distress and Loss
Re-framing the pandemic crisis through Islamic faith and destiny.	• Spiritual coping mechanisms • Meaning-making	Resilience through faith and acceptance of "takdir" (God and Destiny)

1. Perceived Vulnerability to Infection and Adaptive ART Adherence

Participants in this study realized that they were vulnerable to COVID-19. Although none of the participants in this study experienced getting COVID-19 themselves, many expressed concerns about the risk of becoming infected. Approximately half of the participants (6 of 11) explicitly mentioned that they felt especially vulnerable to COVID-19 because of their HIV status.

> *"We are at risk for getting COVID-19, 50% to get it. So, we are a vulnerable population for COVID-19. Therefore, we have to eat regularly, take our medication regularly, and do exercise."* (P6)

> *"In the beginning of the COVID-19 pandemic, we were scared…what will happen with us? We are diagnosed with HIV and already have the virus in our body. We are at risk for getting COVID-19. What should we do to protect us from COVID?"* (P9)

Nearly all tried to follow the national guidelines to avoid getting COVID-19.

"We are human, we try our best not to get infected with COVID-19 by following health protocols. Sometimes, we are worried, we may someday get COVID-19. For me, I follow health protocols such as eating healthy food, stay away from crowds." (P6)

"Then we got a lot of information about COVID-19, including health protocols, wearing masks, staying at home, and using hand sanitizer. We had to stay adherent with our ARV." (P8)

Despite all the difficulties and uncertainties WLWH faced during the pandemic, nearly all participants (10 of 11) reported maintaining ART adherence throughout the pandemic. All participants were recruited from NGO and clinical networks who remained engaged in HIV care and reported continuous ART use. This high rate of adherence was driven by an intense fear of COVID-19 co-infection given their pre-existing health status, combined with adaptive modifications implemented by local clinics.

Most participants living in the Jakarta area remained adherent despite the pandemic. Hospitals and clinics in smaller cities and rural areas had fewer COVID-19 cases. All the participants from Mojokerto also stated that although they were not always able to obtain their medication on time, they were still able to continue adhering to their treatment. Participants stated,

"I've never missed the dose. But sometimes, I was late taking my ART. I have my own principle…I always take my medicine even though sometimes I'm late from the time I take my ART… The important thing is that I take my ART every day, that's it. For people with HIV like us, we must adhere to our medication every day. Don't miss it." (P10)

"As people living with HIV, we must be disciplined about taking our medication every day. We cannot miss a dose. Think of it like a wall clock: if the battery runs out, the clock stops working." (P1)

The ability to remain adherent was a result of both the determination to remain adherent and personal routines developed to reinforce adherence among participants in this study, as well as health system efforts to meet their needs. At the beginning of the pandemic, health system priorities were focused on immediate crises. For both health providers and patients with chronic diseases such as HIV, there was uncertainty and confusion about the appropriate procedures to meet their ongoing health needs. For WLWH, obtaining ARTs in the usual way with an individual appointment was very time consuming and exposed them to many others seeking care. However, within three to six months after the lockdown began, hospitals and clinics began to modify the procedure to facilitate obtaining medication. The participants no longer needed appointments and did not have to stand in a queue to register and see a provider. Instead, they were able to go directly to the clinic where ARTs were provided. The supply of medication at each visit was increased from a 30-day supply to a 3-month supply, thereby reducing the frequency of visits. Some clinics also began allowing one person to pick up the medication supply for 5-10 patients who knew and lived near each other. This new approach greatly reduced waiting time and congestion, reducing the risk of COVID-19 exposure for participants as well as other patients and providers. These changes in ART procedures occurred in all four areas in which the study participants lived. The new procedures greatly helped participants stay adherent while substantially reducing their exposure to other patients who might be infected with COVID-19.

Participants mentioned that they learned a lot from the pandemic. During the pandemic, they tried many ways to stay adherent with their ART, although it was difficult to get ART on time due to pandemic.

"I learned from the pandemic, that there are many ways to stay adherent with ART, and there is no excuse not to take ART due to running out of ART. We can use delivery orders such as grab, or ask our family members to take ART. Now, COVID-19 just disappeared and everything is back to normal. So, access to health service is easy. There is no reason for not

taking ART. If you can't go by yourself to take our ART, you can ask your family to take it for you, like during pandemic time. For me, my husband helps me to take my ART if I can't go to take it.

So the point is, stay adherent, no matter what happens…whether pandemic or not, stay adherent with your ART to have a better life." (P3)

"I have strong motivation. There was a time when my condition deteriorated, my weight dropped to just 35 kg. But after taking my medication regularly, my appetite returned. I was simply trying to stay alive; that was all. (P8)

When I ran out of stock and I could not leave my house, I borrowed some pills from my friend who took the same medication. I returned the ART the following week after I had time to pick up my own supply from the hospital." (P11)

One participant who was not able to remain adherent lived in one of the most densely populated areas in Jakarta. She explained:

"I did not take my medication regularly during the COVID-19. I am not dropping out, but I …did not go outside during the pandemic, so I did not have any medication, did not take my medication regularly… You know how complicated the procedure was at the hospital, it's so crowded, and it's a long procedure if we want to take ART, so I decided not to go out." (P9)

Investigator triangulation showed consistent agreement among the research team that participants' perceived vulnerability to COVID-19 because of their HIV status motivated them to maintain ART adherence. The investigators also agreed that sustained adherence was supported by the combination of individual adaptive strategies and health system modifications, including multi-month ART dispensing, simplified medication collection, and family or peer support. The single case of non-adherence was interpreted as resulting from significant access barriers during the early pandemic rather than reflecting the experiences of most participants. This triangulated interpretation strengthened the credibility of the findings.

2. Economic Precarity and Adaptive Livelihoods

The economic toll of national lockdowns presented severe challenges for the participants, who lacked financial safety nets. Ten of the eleven participants reported acute financial stress. Most were housewives dependent on their husbands' informal earnings or worked in precarious informal roles themselves. For example, one participant who worked as a home masseuse noted that her household income vanished because clients feared infection. Similarly, other participants shared how the economic shutdown crippled their livelihood:

"During the COVID-19 pandemic, massage bookings dropped significantly because my clients were afraid of being infected from me. Sometimes, if I was asked to come over to their houses and I showed signs of a cough or the flu, they would refuse and cancel the appointment." (P10)

"It was difficult to earn money. Before the COVID-19 pandemic, we could take the bus (trans Jakarta) or use public transportation easily, from Menteng to, I took public transport and paid Rp 4.000. During the pandemic, the price increased. I used the ride-hailing motorcycle. I had to pay at least from Rp 14.000, and it is a lot for me since my income decreased." (P11)

"I usually worked and went to the factory every day. During the COVID-19 pandemic, only a few people were allowed in one shift in the factory, so I only went to work twice or three times a week. As a consequence, my salary was lower than before the COVID-19 pandemic. At that time, I sat and felt empty inside. I was thinking, what I could eat tomorrow, because, I do not have enough income, and my kids need food" (P7)

In contrast, participants who had their "Warung" (food stall) received many food orders during the pandemic due to other food stalls closing. They were busy with the order of food, as a consequence, they had limited time with their children. As some participant said:

"I usually spent more in the afternoon with my children. Every day, I open my warung [food stall] in the morning and close at noon…then, during the pandemic, I got many food orders because there are many other food stores close. So, I still open my warung until 6 pm. Then, I would go back home after 6 pm. I had less time with my children at night. I was already exhausted at night." (P6)

"I was busy running my coffee shop, delivering orders during the pandemic to meet customer demand. As a result, I feel like I have less time to spend with my children at home in the afternoons." (P4)

Investigator triangulation showed consistent agreement that the COVID-19 pandemic had substantial economic consequences for most participants, primarily through reduced household income, unstable employment, and increased living costs. The investigators also agreed that while a small number of participants experienced increased business opportunities, these gains were accompanied by new challenges, such as reduced time with their families. This triangulated interpretation strengthened the credibility of the finding that the pandemic affected participants' economic well-being in different ways depending on their employment and family circumstances.

3. Relational Support as a Buffer for Treatment Continuity

Marital status acted as a significant mediator of the care experience. All married women in this study reported receiving vital support from their spouses, which acted as an immediate buffer against stigma and logistical barriers. Husbands frequently assisted by retrieving ART refills from clinics or providing daily verbal reminders. However, this dynamic was exclusively applicable to married participants. Single, divorced, or widowed participants lacked this immediate buffer and reported relying on discrete peer-support networks or facing heightened isolation due to their hidden HIV status.

"During COVID-19, I was afraid to get infected due to my HIV status. Then, my husband helped me to take my ART at the hospital, while I stayed at home. He does not get HIV infected, and he is healthy, so he is okay." (P8)

"During the pandemic, we were highly vulnerable to COVID, so we stayed at home. Regarding my ARV medication, I could ask a colleague from an NGO for help; he could go to the hospital to pick up my meds. He was not living with HIV. He's healthy, so he was able to assist us. He helped us to get our ARV medication". (P11)

Other participants mentioned that their husband always reminded them to take their ART, if they forgot.

"I work at my warung, and sometimes, I forget to take my medication in the afternoon because there are many customers. Then, my husband will call me or even come and give me my ART to take on that time." (P6)

"My husband and I both take ART in the morning. So, if I forget to give him his medication, it means I've forgotten to take my own as well; He reminds me to take my medicine, and vice versa. We take our ART together after breakfast." (P1)

Most participants had already developed a routine that integrated taking medication into their daily lives. These routines helped them remember continuing ARTs despite the many disruptions during or after the pandemic. Most of the participants also noted that they had a strong network of friends living with HIV, as well as family support, and these connections helped participants

remain adherent. Participants mentioned the importance of adequate peer support that helped them and their friends adhere to their medication despite the pandemic. They stated:

> *"Because we're aware of our medications and have commitment to stay adherent, we remind each other to stay adherent, support each other."* (P3)

> *"We usually chat via a WhatsApp group. My friend knows my medication schedule, twice a day, at 7 a.m. and 7 p.m. So, in the morning, he sends a message to remind me before 7 o'clock; the same goes for the evening, whenever he has a moment to send a message."* (P2)

Investigator triangulation showed consistent agreement that social support was an important facilitator of ART continuity during the COVID-19 pandemic. The investigators agreed that married participants primarily relied on their spouses for medication reminders and ART collection, while unmarried participants depended more on peer networks and NGOs for practical and emotional support. Across both groups, strong social support helped participants overcome barriers to treatment and maintain ART adherence, strengthening the credibility of this theme.

4. Psychosocial Distress and Loss

Like many other Indonesians, participants experienced great fear and personal loss during the pandemic. Fear of COVID-19 for themselves remained a constant concern, especially because they all had a serious pre-existing condition. Many also experienced losses of one or more close relatives or friends. All witnessed high death rates nationally and most experienced high distress about the many deaths in their community as participant stated:

> *"There were so many people who died due to COVID-19… my mother, my friends, even my neighbors died because of COVID-19. I could not tell how I felt because so many people died. One by one people who I was close with. It stressed me out."* (P4)

> *"Every day, there was an announcement from the prayer room that someone had passed away. This stressed me out, because so many people were dying and they were my neighbors that I used to see every day before the pandemic."* (P5)

One of the greatest spiritual and social losses for many participants was the gathering to practice their religion as a group. Most participants were Muslim, the dominant religion in Indonesia. In Islam, expressing faith and praying together is an important part of the religion. Collective religious activities also provide socializing and mutual support to one another through good times and hardships. The pandemic also led to isolation and negative impacts on overall mental health. Owing to restrictions on going out, people stayed at home during the pandemic. They have experienced a sharp decline in many of their usual social activities. Fewer meetings were held outside the home. Many WLWH felt lonely because they had less contact with their friends. Some participants missed seeing their friends because they did not attend face-to-face meetings.

> *"Before the pandemic, we had regular meetings once a month such as arisan (a monthly social gathering) and peer group meeting... However, during the pandemic COVID-19 we did not do it anymore. We missed hugging each other, shaking hands, and chit chatting."* (P2)

> *"We usually recited the Quran together every month. Since the COVID-19 pandemic, there was no gathering together, and all activities were postponed until the situation was under control, because the number of COVID patients was increasing at that time."* (P5)

Investigator triangulation showed consistent agreement that the COVID-19 pandemic had a profound impact on participants' daily lives and well-being. The investigators agreed that fear of infection, grief over the loss of family members and friends, social isolation, and disruption of religious and community activities contributed to emotional distress. Despite differences in

individual experiences, all investigators consistently interpreted these psychosocial challenges as a common consequence of the pandemic, strengthening the credibility of this theme.

5. Resilience Through Faith and Acceptance of "Takdir" (God and Destiny)

Participants demonstrated remarkable psychological resilience by framing their hardships through Islamic spiritual constructs. Rather than viewing faith as an obstacle, participants utilized their belief systems as active psychological coping and meaning-making frameworks. They adhered strictly to health protocols while practicing "takdir" (God and Destiny), which helped mitigate anxiety and motivated them to stay healthy by consistently taking their ART. Nearly all of these WLWH (9 of 11) expressed their belief in God and that what happens is determined by God's hand. These strong beliefs helped WLWH live with the difficulties and uncertainties of COVID-19 because they only needed to do their best and not to worry about what would happen because they trusted in God and believed that God will give the best outcome for them. People still have to do their best to maintain their health, but they do not need to worry about the outcome because God will determine that. As one participant explained:

> *"I used double masks during the pandemic and brought hand sanitizer with me. We try our best. The result is lillahi ta'ala."* (P8)

> *"If we are indeed destined to fall ill, we just have to accept it, what else is there to say"* (P7)

Investigator triangulation showed consistent agreement that faith and acceptance of "*takdir"* (God's destiny) were important sources of resilience for participants during the COVID-19 pandemic. The investigators agreed that participants combined trust in God with active efforts to protect their health, including adhering to health protocols and maintaining ART adherence. This triangulated interpretation strengthened the credibility of the finding that spiritual beliefs helped participants cope with uncertainty and sustain hope during the pandemic.

Discussion

This study explored the impact of the COVID-19 pandemic on WLWH. Related to the selection criteria, the WLWH in this study differed somewhat at the time of the interview, they all said they were not engaging in HIV high-risk activities. The HIV epidemic has shifted in Indonesia. Individuals not identified with any specific high-risk group comprise a growing proportion of WLWH, but they have not been studied as extensively as WLWH from high-risk groups. For example, our extensive search identified only two studies in Indonesia about housewives living with HIV at the time they were infected with HIV (Dida, Yona, & Waluyo, 2021; Ismail *et al*., 2018). Not surprisingly, both studies found that housewives experienced high stigma and stress which led to lower quality of life and reluctance to disclose their status or seek treatment. Our study sample adds valuable insights regarding the specific needs of the growing group of Indonesian WLWH who do not currently identify themselves with a high-risk group.

Our findings illustrate that maintaining access to ART medications was highly dependent on localized structural adaptations. Globally, healthcare systems underwent rapid modifications to protect HIV care continuity; however, literature indicates that these changes were unevenly distributed across Indonesia (Fauk *et al*., 2023; Suryana *et al*., 2022). From the perspectives of our participants, the easing of administrative hurdles via clinical streamlining during peak waves was a primary success factor that allowed them to stay adherent easily compared to normal operational periods.

Despite the many challenges of obtaining their medications during the pandemic, all the participants, except one participant in our study remained adherent to their treatment. In our study, all participants were recruited from NGO and clinical networks. They stayed involved in HIV care and kept using ART continuously. However, our study did not include enough WLWH who stopped

their treatment entirely or left care completely. WLWH in our study attributed this achievement to both their personal determination and adherence routines and to more flexible procedures for obtaining ARTs initiated by the health system. However, COVID-19 has caused great economic distress and transportation difficulties have made getting to clinics challenging. The pandemic also negatively affected every aspect of women with HIV's lives, including decreased quality of life and increased mental health issues, especially anxiety and depression. Participants identified two factors as critically important for getting through the pandemic: social support from family such as husband, and their peer with HIV networks. The same themes emerged in all four sites, but the severity of the pandemic's impact on PLWH was greatest in Jakarta, Indonesia's megacity and capital, and least in Samarinda, the smallest city in our study.

Although the relatively strong adherence to ART during the pandemic is a success story, participants suffered greatly from the overall negative impacts of the pandemic on economic and transportation resources, quality of everyday life, and mental health. PLWH in Indonesia and globally had unique concerns related to the pandemic, including their greater vulnerability to COVID-19, need for ongoing ART treatment, and the ongoing burden of stigma and discrimination (Fauk *et al.,* 2023; Gedela *et al*., 2022; Karjadi *et al*., 2021; Najmah *et al*., 2021; Sukmaningrum *et al*., 2024; Suryana *et al*., 2022). This phenomenon can be comprehensively analyzed through a syndemic perspective, which posits that epidemics do not exist in isolation but interact synergistically with socio-structural inequalities (Kalichman & El-Krab, 2022). In this study, pre-existing structural vulnerabilities including gender inequality, economic dependence, and pervasive HIV-related stigma interacted directly with the external shock of the COVID-19 pandemic. For instance, economic lockdowns immediately eliminated informal incomes, disproportionately affecting housewives who relied on their husbands' daily wages. This financial distress compounded the baseline psychosocial anxiety of living with a chronic, stigmatized illness under the threat of a novel respiratory pathogen.

To buffer these syndemic pressures, social and spiritual assets emerged as critical lifelines. Spousal support provided a necessary buffer for married participants, protecting them against everyday stigmatization and financial shocks. Concurrently, personal religious faith and the cultural acceptance of "takdir" (God and Destiny) served as profound coping and meaning-making mechanisms. Because all participants were Muslim and most were Javanese, the role of "takdir" (God and Destiny) should be interpreted as a context-specific coping mechanism rather than a universal experience among all WLWH in Indonesia. While some international literature has characterized religious observations as potential barriers to strict clinical adherence due to fasting or fatalism (Ahmed *et al*., 2022; Perngmark, Sahawiriyasin, & Holroyd, 2023), our study demonstrates that Islamic faith functioned as a powerful motivator for health preservation among Indonesian WLWH. This finding has received limited attention in prior Indonesian qualitative studies identified by the authors and warrants deeper integration into culturally competent care models.

Despite many difficulties, adherence remained relatively high globally due to health system adaptations similar to those in Indonesia, such as reducing clinic visits, providing a larger supply of ARTs per visit, as well as greater use of telehealth in countries with that capability (Ahmad, Fuller, & Sohn, 2024; Campbell *et al*., 2022; Hung *et al.,* 2022; Matsuda *et al*., 2022; Tran, Vu, & DeSilva, 2022). Substantial evidence both during and prior to the pandemic found that WLWH remained connected to the health system and continued adherence even when they had fewer visits, especially when fewer provider visits were linked to increased social support from community volunteers, family, and other PLWHs and/or greater use of telehealth and phone-based programs (Ismail *et al.,* 2023; Matsuda *et al.,* 2022; Nyoni & Okumu, 2020; Yona *et al*., 2025). This additional support is relatively low cost and reduces the use of health provider services.

Integrating innovative programs such as community-based support, telehealth and phone-based innovations can maintain high-quality treatment using fewer health system resources, allowing more resources for bringing WLWH into treatment, especially in countries like Indonesia where the proportion of PLWH in treatment is low. A study using phone-based application to improve adherence to ARV indicated positive responses (Ismail *et al*., 2023).

The findings of this study have important implications for nursing practice, particularly in the context of public health crises. Nurses should use a comprehensive, patient-centered approach that incorporates advocacy, emotional support, patient education, and care coordination. These roles may contribute to supporting continuity of HIV care during future public health emergencies. By easing access to care, encouraging treatment continuity, and addressing psychosocial issues, nurses may help WLWH navigate healthcare disruptions more effectively during future public health emergencies. Nursing practice should also prioritize adaptability and response to evolving healthcare systems. Strengthening these adaptive nursing approaches may inform future intervention development for WLWH. These ramifications align with prior research showing that community-based and patient-centered nursing interventions can enhance treatment compliance and bolster involvement in HIV care during emergencies (Ahmad, Fuller, & Sohn, 2024; Nyoni & Okumu, 2020).

This study has several limitations. First, the sample size is relatively small and was drawn via purposive sampling through specific NGO and clinical networks, which introduces a potential selection bias. Consequently, the sample exclusively represents WLWH who managed to remain treatment-adherent, thereby underrepresenting the critical perspectives and barriers faced by women who experienced complete treatment interruptions or dropped out of care during the pandemic. Second, because treatment continuity was assessed using participants' self-reports, objective indicators such as pharmacy refill records, viral load measurements, or medical records were not available to verify adherence. Lastly, while the study sought geographic diversity by including four cities, the findings reflect localized Indonesian contexts and cannot be broadly generalized to all WLWH across the country or to differing healthcare delivery models.

Conclusion

This qualitative descriptive study explored the impact of the COVID-19 pandemic on women living with HIV in Indonesia. Participants described maintaining ART continuity despite experiencing substantial economic hardship, psychosocial distress, and disruptions to everyday life. Flexible clinic procedures, support from spouses and peers, and religious coping emerged as important resources that helped participants navigate these challenges. Because all participants were recruited through HIV clinics and community organizations and findings were based on participants' self-reports, the results should be interpreted within this context. Rather than demonstrating treatment effectiveness, these findings provide insights into how women perceived and managed HIV care during a public health emergency. The findings may inform the development of culturally sensitive, family-aware, and contextually appropriate nursing support models and future interventions aimed at strengthening continuity of HIV care during similar crises.

Acknowledgements

This work is supported by Directorate Research and Community Engagement Universitas Indonesia, Grant for international Publication/HIBAH PUTI 2022, grant no: NKB-391/UN2.RST/HKP.05.00/2022. We are sincerely grateful to all participant in this study for their willingness to participate in this study.

References

Ahmad, S., Fuller, S., & Sohn, A.H. (2024). The impact of COVID-19 on HIV treatment and care delivery in South and Southeast Asia: A qualitative study. *HIV Research & Clinical Practice, 25*(1), 1-7. doi:10.1080/25787489.2024.2355763

Ahmed, A., Dujaili, J.A., Jabeen, M., Umair, M.M., Chuah, L.-H., Hashmi, F.K., Awaisu, A., Chaiyakunapruk, N. (2022). Barriers and enablers for adherence to antiretroviral therapy among people living with HIV/AIDS in the era of COVID-19: a qualitative study from Pakistan. *Frontiers in pharmacology, 12*, 807446:1-14 doi:10.3389/fphar.2021.807446

Campbell, L.S., Masquillier, C., Knight, L., Delport, A., Sematlane, N., Dube, L.T., & Wouters, E. (2022). Stay-at-home: The impact of the COVID-19 lockdown on household functioning and ART adherence for people living with HIV in three sub-districts of Cape Town, South Africa. *AIDS and Behavior, 26*(6), 1905-1922. doi:10.1007/s10461-021-03541-0

Dida, N.I., Yona, S., & Waluyo, A. (2021). HIV disclosure, stigma, and stress impacting quality of life of housewives with HIV in Kupang, Indonesia: A cross-sectional study. *Enfermeria Clinica, 31*, S266-S270. doi:10.1016/j.enfcli.2020.09.013

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

Fauk, N.K., Ward, P.R., Hawke, K., & Mwanri, L. (2021). HIV Stigma and discrimination: perspectives and personal experiences of healthcare providers in Yogyakarta and Belu, Indonesia. *Frontiers in Medicine, 8*, 625787. doi:10.3389/fmed.2021.625787

Gedela, K., Rajus, N., Luis, H., Fridayantara, W.D., Irwanto, I., Sukmaningrum, E., & Wignall, F.S. (2022). Antiretroviral drug switches to zidovudine-based regimens and loss to follow-up during the first COVID-19 lockdown in Bali, Indonesia. *HIV Medicine, 23*(9), 1025-1030. doi:10.1111/hiv.13298

Hsieh, H.-F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288. doi:10.1177/1049732305276687

Hung, C.-C., Banerjee, S., Gilada, I., Green, K., Inoue, Y., Kamarulzaman, A., Leyritana, K., …, Choi, J.Y. (2022). Impact of COVID-19 on the HIV care continuum in Asia: Insights from people living with HIV, key populations, and HIV healthcare providers. *PloS One, 17*(7), e0270831. doi:10.1371/journal.pone.0270831

Ismail, R., Voss, J.G., Woods, N.F., John-Stewart, G., Lowe, C., Nurachmah, E., Yona, S., …, Boutain, D. (2018). A content analysis study: concerns of indonesian women infected with hiv by husbands who used intravenous drugs. *The Journal of the Association of Nurses in AIDS Care, 29*(6), 914-923. doi:10.1016/j.jana.2018.04.012

Ismail, R., Yona, S., Nurachmah, E., Khariroh, S., Sujianto, U., Santoso, W., Bangun, S.A., Voss, J. G. (2023). Feasibility of Lantern using whatsapp to improve antiretroviral therapy adherence. *Computers, Informatics, Nursing, 41*(11), 915-920. doi:10.1097/CIN.0000000000001054

Januraga, P.P., Lukitosari, E., Luhukay, L., Hasby, R., & Sutrisna, A. (2025). Mapping key populations to develop improved HIV and AIDS interventions: Multiphase cross-sectional observational mapping study using a district and city approach. JMIR Public Health and Surveillance, 11, e56820. https://doi.org/10.2196/56820

Joffe, A.R. (2021). COVID-19: Rethinking the lockdown groupthink. *Frontiers in Public Health, 9*, 625778. doi:10.3389/fpubh.2021.625778

Kalichman, S.C., & El-Krab, R. (2022). Social and behavioral impacts of COVID-19 on people living with HIV: Review of the first year of research. *Current HIV/AIDS Reports, 19*(1), 54-75. doi:10.1007/s11904-021-00593-8

Karjadi, T.H., Maria, S., Yunihastuti, E., Widhani, A., Kurniati, N., & Imran, D. (2021). Knowledge, attitude, behavior, and socioeconomic conditions of people living with hiv in indonesia during the COVID-19 pandemic: A cross-sectional study. *HIV/AIDS (Auckland), 13*, 1045-1054. doi:10.2147/HIV.S333469

Mahendradhata, Y., Andayani, N.L.P.E., Hasri, E.T., Arifi, M.D., Siahaan, R.G.M., Solikha, D.A., & Ali, P.B. (2021). The capacity of the indonesian healthcare system to respond to COVID-19. *Frontiers in Public Health, 9*, 649819. doi:10.3389/fpubh.2021.649819

Malterud, K., Siersma, V.D., & Guassora, A.D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative health research*, *26*(13), 1753–1760. https://doi.org/10.1177/1049732315617444

Matsuda, E.M., Oliveira, I.P.d., Bao, L.B., Manzoni, F.M., Campos, N.C., Varejão, B. B., . . . Brígido, L. F.d.M. (2022). Impact of COVID-19 on people living with HIV-1: Care and prevention indicators at a local and nationwide level, Santo André, Brazil. *Revista de Saúde Pública, 56*, 37-37. doi:10.11606/s1518-8787.2022056004314

Ministry of Health of the Republic of Indonesia. (2025). Berani tes, berani lindungi diri: Kemenkes targetkan eliminasi HIV dan IMS tahun 2030. Retrieved from https://kemkes.go.id/id/berani-tes-berani-lindungi-diri-kemenkes-targetkan-eliminasi-hiv-dan-ims-tahun-2030

Mokaddam, M., Kronfli, N., Sheehan, N.L., Reyes, A. G., Dubuc, D., Loutfy, M., Kaida, A., …, Pokomandy, A.d. (2025). Antiretroviral therapy use, self-reported adherence, and viral suppression among women living with HIV in Canada. *HIV Medicine, 26*(7), 1060-1073. doi:10.1111/hiv.70034

Montgomerie, E.K., Michel, C., Sanchez-Covarrubias, A.P., & Duthely, L.M. (2023). Stress, support, and length of diagnosis among women living with HIV/AIDS in the Southern USA, during the COVID-19 pandemic. *HIV AIDS (Auckl), 15*, 95-103. doi:10.2147/hiv.s388307

Najmah, N., Davies, S.G., Kusnan, K., & Davies, T.G. (2021). 'It's better to treat a COVID patient than a HIV patient': using feminist participatory research to assess women's challenges to access HIV care in Indonesia during the COVID-19 pandemic. *Therapeutic Advances in Infectious Disease, 8*, 20499361211064191. doi:10.1177/20499361211064191

Nyoni, T., & Okumu, M. (2020). COVID-19-compliant strategies for supporting treatment adherence among people living with HIV in Sub-Saharan Africa. *AIDS and Behavior, 24*(9), 2473-2476. doi:10.1007/s10461-020-02888-0

Perngmark, P., Sahawiriyasin, O., & Holroyd, E. (2023). Experiences of Thai-Muslim patients regarding inconsistent antiretroviral therapy adherence: an exploratory descriptive qualitative study. *Belitung Nursing Journal, 9*(3), 253-261. doi:10.33546/bnj.2426

Sukmaningrum, E., Levy, J., Negara, M.D., Devika, D., Wardhani, B.D.K., Wulandari, L.P.L., & Januraga, P.P. (2024). Lived experience, social support, and challenges to health service use during the COVID-19 pandemic among HIV key populations in Indonesia. *BMC Health Services research, 24*(1), 1-19. doi:10.1186/s12913-024-11227-1

Suryana, K., Suharsono, H., Indrayani, A.W., Wisma Ariani, L.N.A., Putra, W.W.S., & Yaniswari, N.M.D. (2022). Factors associated with anti-retroviral therapy adherence among patients living with HIV during the COVID-19 pandemic: A cross-sectional study. *Frontiers in Psychiatry, 13*, 824062: 1-7. doi:10.3389/fpsyt.2022.824062

Tambunan, T.T.H. (2021). COVID-19 Pandemic and severity of economic impacts: The Indonesian case. *Global Economics Science*, 1-15. doi:10.37256/ges.232021898

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Journal of the International Society for Quality in Health Care*, *19*(6), 349–357. https://doi.org/10.1093/intqhc/mzm042

Tran, N.K., Vu, B.N., & DeSilva, M.B. (2022). Impacts of the COVID-19 pandemic on people living with HIV who are members of vulnerable groups in Vietnam. *AIDS and Behavior, 26*(9), 2855-2865. doi:10.1007/s10461-022-03630-8

UNAIDS. (2024). Jakarta: Fast-Track City. Retrieved from https://fasttrackcitiesmap.unaids.org/cities/jakarta/

UNAIDS. (2025). *Status of HIV programmes in Indonesia*. Retrieved from https://www.unaids.org/en/resources/presscentre/featurestories/2025/february/20250224_indonesia_fs

World Health Organization. (2023). *Update on coronavirus disease in Indonesia*. Retrieved from https://www.who.int/indonesia/news/novel-coronavirus

Yona, S., Ismail, R., Nurachmah, E., Khariroh, S., Sujianto, U., Santoso, W., Bangun, S.A., Voss, J. G. (2025). Evaluation of a phone-based program to increase adherence to antiretrovirals among PLWH: A Pilot Study. *AIDS and Behavior*, *29*(7), 2168–2178. doi:10.1007/s10461-025-04681-3

Zeleke, T.A., Alemu, K., Ayele, T.A., Denu, Z.A., Mwanri, L., & Azale, T. (2024). Systematic review and meta-analysis on the effect of depression on ART adherence among women living with HIV. *PloS One, 19*(6), e0300106. doi:10.1371/journal.pone.0300106