

Access, Participation, Control, and Advantage of Digital-Based Healthcare Service for Women Living with HIV/AIDS

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Abstract

Gender inequality significantly contributes to the increased vulnerability of women living with HIV/AIDS (WLHA), limiting their access to adequate healthcare and exacerbating social stigma. This study explores the dynamics of access, participation, control, and benefit of digital-based healthcare services for WLHA in Surakarta, Indonesia, employing Harvard's gender analysis framework. It aims to understand how digital health platforms—such as telemedicine, telenursing, telepharmacy, websites, and social media—reshape healthcare engagement for WLHA amidst systemic gender disparities. Using an exploratory qualitative method, data were collected through in-depth interviews, observation, and documentation from key informants including healthcare officials, WLHA, medical workers, and support groups. Analysis followed an interactive model with triangulated sources to ensure data validity. The findings reveal that although digital platforms provide promising access to promotive, preventive, curative, and rehabilitative care, WLHA's full participation remains hindered by male-dominated control over digital technology, entrenched stigma, and institutional discrimination. However, mobile health (mH) interventions have positively influenced WLHA's knowledge, behavior, decision-making, and self-efficacy. This study underscores the urgent need for gender-responsive digital health policies and capacity-building strategies that empower WLHA and reduce structural barriers to equitable health access.

Keywords: mobile health, gender inequality, WLHA, digital healthcare, access, participation, empowerment.

INTRODUCTION

Women Living with HIV/AIDS (WLHA) face a dual vulnerability: biologically due to reduced immunity and socially due to gender-based stigma and structural inequalities. The global burden of HIV/AIDS remains significant, with over 39 million people living with HIV by the end of 2022, including an estimated 20 million adult women aged 15 and above. Despite the universal human right to health, WLHA often encounter stigma and

discrimination in accessing healthcare services (Fauk et al., 2019; Watkins-Hayes, 2019). These inequalities manifest through limited availability, accessibility, acceptability, and quality of care. They are compounded by societal norms that limit women's decision-making power and mobility, thereby reducing their ability to seek and benefit from essential health services. HIV-related stigma entrenched in health systems and communities continues to undermine efforts in prevention and treatment. Therefore, addressing healthcare disparities for WLHA is not merely a matter of service delivery but also of structural gender justice that must be embedded within global and national health policies to ensure inclusiveness, dignity, and equal access for all.

In Indonesia, the HIV epidemic has shown a concerning trend, particularly among housewives who account for 35% of all PLWH. This feminization of the epidemic reflects not only biomedical transmission but also the socio-cultural subordination of women. According to the Ministry of Health (2022), new infections among housewives are rising by 5,100 cases annually due to heterosexual transmission and poor sexual health literacy. The risk is compounded by the vertical transmission of the virus to children during pregnancy, delivery, or breastfeeding. Inadequate knowledge about HIV/AIDS prevention and risky behaviors among male partners further increase women's vulnerability. In Central Java, 2,882 HIV/AIDS cases have been reported, with 33% affecting women, while in Surakarta alone there are 4,184 PLWH including 76 WLHA. Despite interventions, many women still face multiple barriers to accessing care, ranging from socio-economic constraints to deeply rooted stigma. These conditions not only compromise their health outcomes but also challenge broader efforts to control the HIV epidemic in Indonesia.

While existing strategies such as cross-program coordination and NGO partnerships have been implemented to achieve the 2030 "three-zero" targets, these efforts remain inadequate. Healthcare services for WLHA are still bureaucratically inaccessible, and stigma and discriminatory practices are deeply entrenched (George et al., 2018). There is a pressing need for transformative interventions that go beyond conventional delivery methods and actively disrupt the socio-cultural patterns that marginalize women. These include not only community education but also systemic reforms that build inclusive healthcare frameworks. The persistence of vertical silos within healthcare systems makes it difficult for WLHA to receive continuous, holistic care. Negative attitudes from health workers, coupled with lack of confidentiality, deter many women from seeking diagnosis or treatment. In such an

environment, simply expanding services is insufficient; there must be a reconfiguration of the institutional norms that govern access and participation in care. This necessitates gender-sensitive strategies that recognize women's lived realities and integrate their voices into healthcare design and delivery.

Advancements in digital health technologies offer promising alternatives to traditional healthcare systems. Mobile Health (mH) and Electronic Health (e-Health) enable more efficient, cost-effective, and widely accessible interventions for vulnerable groups (Adeagbo, 2019; Free et al., 2013). These tools are not only instrumental in disseminating accurate HIV/AIDS information but also serve as platforms for medication monitoring, virtual consultation, and behavioral interventions. They address critical gaps in geographic access, cost barriers, and time constraints that disproportionately affect women. mH technologies have demonstrated positive outcomes in improving antiretroviral therapy (ART) adherence and reducing stigma through confidential communication. Tools like telemedicine, telenursing, and telepharmacy allow for the remote management of chronic conditions, including HIV, while preserving privacy. However, access to these technologies is also gendered. Cultural norms, digital literacy, and unequal control over technology often inhibit WLHA from fully benefiting from digital health. Thus, while these innovations hold transformative potential, their equitable implementation requires addressing the intersection of technology and gender disparities.

Theoretically, this research adopts the Harvard Gender Analysis Framework, which facilitates systematic identification of gender-based disparities in access, participation, control, and benefits within healthcare systems (March et al., 1999; WHO, 2003; Fumaz et al., 2019). This framework emphasizes that health technologies are not neutral; their design and delivery often reinforce existing gender hierarchies unless actively interrogated. It is thus essential to analyze how digital-based healthcare services impact WLHA differently than other groups. Applying this framework enables researchers to examine how institutional norms, digital capabilities, and social contexts shape healthcare interactions. Through this approach, the study critically assesses whether mH platforms serve as empowering tools or merely replicate offline inequalities. The Harvard model allows disaggregation of access patterns and decision-making dynamics, providing a deeper understanding of gender-specific healthcare experiences. It also supports the development of inclusive policies that

address structural disadvantages while ensuring that digital interventions are responsive to the distinct needs of women living with HIV/AIDS.

This research seeks to investigate how digital-based healthcare services—specifically mH technologies such as telemedicine, telenursing, telepharmacy, and social media platforms—are accessed, used, and experienced by WLHA in Surakarta. The study aims to answer: To what extent do WLHA have access to these services? How do they participate in, control, and benefit from digital health programs? By focusing on these four dimensions, the study addresses the gap in empirical knowledge regarding the gendered dynamics of digital health utilization. Surakarta is selected as a strategic case due to its active telemedicine infrastructure and ongoing public health partnerships. The research applies a qualitative exploratory method involving key informants including medical personnel, health office officials, NGOs, peer support groups, and WLHA themselves. Data were gathered through observation, interviews, and documentation and were validated through triangulation. This design provides a rich understanding of both institutional provisions and user-level experiences, allowing the study to contribute meaningfully to the discourse on digital health equity for women.

In conclusion, this study contributes to the growing field of gender and digital health by offering an in-depth analysis of WLHA's experience with telehealth technologies in Surakarta. It responds to the critical gap in literature and policy on gender-inclusive healthcare systems by examining how digital tools both alleviate and reproduce inequalities. The study's implications extend to healthcare policymakers, digital health designers, and gender justice advocates seeking to ensure that WLHA are not left behind in the digital health revolution. It emphasizes the need for participatory design, inclusive policy frameworks, and ongoing evaluation mechanisms that prioritize the voices and needs of marginalized populations. Future interventions must integrate gender analysis at every stage—from platform development to service delivery—so that technology becomes a tool of empowerment rather than exclusion. This research offers a practical roadmap for leveraging mH technologies in ways that advance gender equity, support chronic disease management, and affirm women's rights to dignified, accessible, and high-quality healthcare.

DISCUSSION

Digital Health Service in Surakarta Indonesia

Many HIV/AIDS incidences throughout world result in more developing intervention for WLHA. The government of Surakarta Indonesia has applied mH including *telemedicine*, *telenursing*, *telepharmacy*, online health education, health application, podcast and health youtube channel, website and social media in various digital platforms. In the presence of medical telemedicine service, according to the head of Disease Prevention and Management (P2P) of Surakarta City's Health Service Office, the public including WLHA can receive better healthcare service at low cost, and even the service can arrived at home easily. Generally, *telenursing* in the formats of text or reminder phone is used for 8-12 weeks on average to 24 weeks at longest. The application-based *telenursing* developed has been adjusted with the development of cellular phone existing. Majority *telemonitoring* or *telenursing* message contains the message for reminding drug consumption, online counseling, message for reminding routine visit control, and some other educational materials concerning side effect and advantage of routine drug consumption to WLHA (Lathifah et al., 2022).

Several public health centers (*Puskesmas*) and Referral Hospitals for WLHA in Surakarta have developed *telehealth* such as *telenursing*. This application-based mH is developed and adjusted with the development of cellular phone existing. The use of interactive short message reminder to improve the compliance with antiretroviral therapy in WLHA in the range of young adult age has good potential. This *telenursing* intervention is considered as attractive and practical, very acceptable to WLHA, and helpful in leading to the increased suppression of viral load. The compliance with antiretroviral therapy seems to be related to increasing virus suppression and therefore can improve the WLHA's compliance with medication. The application of easy and practical *telenursing* is developed according to the WLHA targeted. The use of *telenursing* at low cost is acceptable to WLHA and thereby there is an increase in the ARV drug taking among most WLHA receiving *telenursing* treatment compared with that in other groups not receiving the treatment. Supporting medical personnel and family are useful as the reminder in *telenursing* use to improve the compliance with ARV medication in WLHA in Surakarta. Puskesmas in Surakarta are committed to supporting government programs by developing telemedicine technology by providing 1 (one) clinician to every family. The scope of HIV/AIDS program provided by telemedicine is fairly broad including providing healthcare service including, clinical, educational, and

long-distance administrative services using audio transfer, videography using telecommunication devices, conducted through a two-way communication between clinicians and patients.

Patient's wellbeing and disease status of PWHA, including WLHA, become an important consideration in choosing *telehealth* program, viewed from clinician's perspective. The nurses in Puskesmas Gading Surakarta dealing with WLHA state that there is a difference of *telenursing* effect on the compliance with medication. Viewed from WLHA's perspective, the interest in *telehealth* service is not related to health status. The willingness to use *telehealth* involves those considered as having very good and bad health condition, those with controlled HIV and suppressed HIV viral load, and those with uncontrolled HIV. However, WLHA developing HIV in long term for more than 10 years or consuming ART for more than 10 years, and having more complex ART regime are all factors related to lower possibility of choosing *telehealth* as an alternative to clinical visit for their HIV treatment. In addition, another reason is related to the intervention coverage largely affecting at individual level only, with minimum effect at health treatment and community level. Several WLHA being the patients of dr. Moewardi Surakarta hospital state that the presence of mH has some advantages: convenience, comfort, reduced transportation need, and better health outcome.

Accessibility, Participation, Decision Making, Control, and Advantage of mH to WLHA

There is a Peer Group called Solo Plus in Surakarta, consisting of PWH coming from various age groups, sex, sexual orientation, education and job. Its member currently consists of 170 PWH, because not all PWH are affiliated with Solo Plus Peer Group. The chairperson of Solo Plus Peer group state that the objective of Solo Plus Peer Group is to support PWH and their family. It is worrying to know that there is an increase in the number of HIV/AIDS cases in women with no high risks sexual behavior such as housewives, because they are infected by their permanent partner (husband) with high risks sexual behavior. The more terrible impact is the increase in the number of infections in women giving birth to HIV-infected babies. Housewives are vulnerable to HIV/AIDS infection because their low bargaining and negotiation power in sexual relation (García-Micó & Laukyte, 2023).

WLHA affiliated in Solo Plus Peer Group in Surakarta can access various programs and activities to prevent and to overcome HIV/AIDS under the coordination of Surakarta Regional AIDS Commission. Through WAG and social media such as twitter, facebook,

instagram, youtube, WLHA can exchange information with each other related to promotive, preventive, curative, and rehabilitative HIV/AIDS service. They can access healthcare service facilitated by public health center (*puskesmas*) and hospital existing in Surakarta through either conventional or online system using the health insurance they have including public, Healthy Indonesia Card (Indonesian: *Kartu Indonesia Sehat*), National Health Insurance provided by Social Insurance Administration Body (Indonesian: *BPJS*) or private health insurance. Both men with HIV/AIDS and women living with HIV/AIDS (WLHA) can access information easily from social media, including HIV/AIDS care, support, and treatment (CST) service without discrimination. WLHA state that they can access ARV through Mobile VCT to check their HIV status. However, facing technical constraint in accessing mH, WLHA tend to be so submitted and passive that prefer using conventional service to digital service.

WLHA in Surakarta can access digital healthcare service when their health condition goes down, despite some limitation. Basic attitude, access, and participation of WLHA are most closely related to the use of mH concentrated on the need perceived to use application and perception that the medical personnel existing in the healthcare facility or clinic will help. In the family, as WLHA, the housewives' decision in accessing mH is affected by their husbands, as it is related to the service cost spent. It indicates the women's dependence on the men (Campbell et al., 2019; Ma et al., 2019; Salamah et al., 2022). Self-motivation of WLHA and effect of clinical staffs can encourage and keep WLHA use *telenursing*. Age does not result in difference as expected, because of the active use of phone at that age despite simple type of cellular phone. This has an important implication to the development of mH in the future recalling the importance of including technical advance to older adults. The advantage of combining SMS/text message and more attractive media is important to give the participants an opportunity of catching the additional message, although it can result in clinical impact for further analysis. Another advantage is the effectiveness of promising and applicable *telenursing* strategy to WLHA and comorbid disorder. The future endeavor can involve the perfection of intervention.

Telenursing has some limitations. A nurse, dealing with WLHA in Dr. Moewardi Surakarta Hospital, states that the nurse cannot trace whether or not the participants have opened and read the information delivered. Thus, we cannot measure the participation of patient or intervention exposure. From post-intervention feedback, it can be seen that several

participants did not read the articles we sent. It indicates the need for better design of content and innovative strategy to trace and to involve participants, and to recommend the program that can help fight against depression and anxiety from the medication undertaken. In addition to internal factors playing a very important part in implementing *telenursing* intervention, supporting medical personnel and family are also useful in reminding the use of *telenursing* to improve the WLHA's compliance with ARV medication.

Advantage of mH to WLHA

Healthcare service digitization is a technological transformation in health sector aiming to help the healthcare service facilities such as hospital, clinic, public health center (puskesmas), independent medical practice, and etc in providing service maximally (Kamulegeya et al., 2020). There is a significant change of health behavior post-intervention, including the compliance with medication and symptom of depression in WLHA. It affects immunology and virology level or status of WLHA. They state that there is an effect on the reduction of treatment cost following the delivery of information via phone. Intervention reduces constraints in economic and physical aspects and stigma when they should be present in the clinic to undertake STI test. Intervention using *telehealth* is also implemented through video conference held in two stages. Intervention can be the demonstration of STI test sample examination kit and the delivery of STI test result. WLHA tends not to engage in HIV and STI tests (Sinha & Schryer-Roy, 2018).

WLHA, mH and Gender Equality

WLHA is a vulnerable group who needs to be advocated for to get a good life and have their rights protected. Mobile Health (mH) is a significant new technological breakthrough in the current era of modernity to guarantee the right to health and survival for WLHA. Therefore, access, participation, control and benefits must really be paid attention to so that they are right on target and fair for all. Community health centers and hospitals as places of health services must be gender responsive, including in this case accommodating and advocating for the needs of patients, including WLHA patients. Looking at WLHA is very important with a gender approach, where women with HIV/AIDS conditions are sometimes cornered and blamed by this environment without exploring the background of the causes. Made a scourge and trash of society. Women tend to remain silent, afraid to reveal any actions or power relations of their partners. They are afraid of being

blamed by family, friends, and the criminal justice system does not provide adequate compensation or legal protection (Felson, Messner, Hoskin, & Deane, 2002; Kingsnorth & MacIntosh, 2004; Fadhilah, N, 2020).

Mobile Health (mH) including *telemedicine, telepharmacy, tele-edukasi, youtube*, and other social media developed corresponding to the people's need, including WLHA in Surakarta Indonesia. The use of digital media by individual and health institution, including *puskesmas* or hospital, providing service to WLHA, is bound by the rule specified in social relation in cyber society. In addition, health institution can utilize a variety of digital data and supporting treatment and medication of patient (Kalichman et al., 2002; Lupton, 2015). In its development, the main key is beneficence. In the presence of mH, the people, including WLHA, can benefit from the healthcare service and it should not harm the patient. The principle of mH is to prioritize autonomy, concentration, and privacy. Information on patient is acquired comprehensively and in full concentration, and the patient's personal data is protected. The users are expected to participate in using and giving input to mH technology as well as possible. There is no difference and discrimination, meaning that in the presence of telemedicine, all patients, including WLHA, are considered as of the same level and equal, equally needing adequate healthcare service. Accountability means that any violation related to public or patient health should be dealt with and solved immediately (March et al., 1999; George et al., 2018; Kaium et al., 2020; García-Micó & Laukyte, 2023). It is as mandated in the Republic of Indonesia's Presidential Instruction Number 9 of 2000 about Gender Mainstreaming. All governmental institutions, including healthcare institutions like Puskesmas and Hospital at national and regional levels are instructed to make gender mainstream in planning, implementing, monitoring, and evaluating all policies, programs, and activities. The government's attempt of fulfilling the right to health for Indonesian citizens, including WLHA, has been mentioned in Article 13 of the Republic of Indonesia's Law Number 36 of 2009 about Health. Everyone, including PLWH has equal right in accessing health resources such as digital healthcare service. It is an attempt to achieve the degree of health as highly as possible. It is mentioned in the Republic of Indonesia's Health Minister Regulation Number 21 of 2013 about HIV/AIDS Management (Schofield, T., & Goodwin, 2005; Risberg et al., 2006)

A retrospective research conducted in correctional facilities compared the potency of HIV sub-specialization management through telemedicine with the primary treatment

clinician of correctional facility on site. The average number of CD4 and the proportion of subject achieving virology suppression are significantly higher when the disease is managed by multidisciplinary sub-specialist team through telemedicine clinic. The forms of alternative meeting for face-to-face visit should also be explored. A study compared patients with one direct visit equipped with electronic meeting (email and phone) and those with more than two direct visits, and found no significant difference in HIV viral load suppression (Jadgal et al., 2022).

The problem of compliance with medication is on which the therapy for WLHA focuses to reduce the complication of disease they suffer from and to improve the patients' wellbeing. Incompliance with antiretroviral (ART) increases the risk of HIV Rna load viral non-suppression, secondary HIV transmission, and drug resistance development. It also has negative impact on the outcome of medication, results in reduced sustainability, and worsens quality of life. Therefore, intervention is always developed to improve the compliance with medication, one of which is through telenursing intervention.

The use of interactive short message reminder to improve the compliance with antiretroviral therapy in WLHA in the range of young adult age has good potential. This *telenursing* intervention is considered as attractive and practical, very acceptable to WLHA, and helpful in leading to the increased suppression of viral load. The intensity of cellular phone use in adult increases on average compared with that in other age; therefore the use of telenursing intervention through cellular phone is the one easily applied to WLHA as an attempt of complying with the medication (Sharpe et al., 2018).

The longer the duration of mH, the higher will be the compliance with medication among WLHA receiving monitoring intervention through their cellular phone. Generally, WLHA tend to use telehealth if any and be available to replace face-to-face clinical visit with telehealth (Dandachi et al., 2020). The compliance with ART and the client satisfaction are evaluated in each of follow-up visit. They also receive counseling about compliance from the trained counselor in each visit. Each of WLHA was told attend all follow-up visit. Specific follow-up action is provided to the participants by evaluating the HIV/AIDS patients' feeling post intervention using telenursing and telemonitoring. In this case, HIV/AIDS patients also can give critique, input, and suggestion for the improvement of healthcare service in the health institution (Haldane et al., 2019).

Telemonitoring or *teleedukasi* affect the improvement of compliance with medication among HIV/AIDS patients. Telenursing in the formats of text or reminder call for WLHA is used for 8-24 weeks on average. This telenursing intervention is considered as very attractive and practical, acceptable to WLHA, and helpful in leading to the increase in the suppression of viral load (Sharpe et al., 2018). The compliance with antiretroviral therapy seems to be related to increasing virus suppression and therefore can improve the WLHA's compliance with medication. The application of easy and practical *telenursing* is developed according to the WLHA targeted, the use of *telenursing* at low cost is acceptable to WLHA, and the increase in the ARV drug taking occurs among most WLHA receiving *telenursing* treatment (Whiteley et al., 2021). Its application and ability of being connected to external devices for medication and tracing fitness can be used and generally acceptable to a group of WLHA (Beauchemin, 2019).

Nursing intervention to WLHA in the attempt of improving access, participation, and compliance with medication in the patients, including health education, empowerment, and support can be taken through making innovation and improving telenursing or telehealth quality, design and method to get more attractive one and to exert broader impact corresponding to the WLHA's need (March et al., 1999; Fumaz et al., 2019). Medical personnel building in utilizing telehealth information technology should be improved as an attempt of improving the effectiveness of service providing using telehealth including audio and video call, and internet media use (March et al., 1999). A strategy that can be taken to improve the utilization of telehealth includes client empowerment, training for service provider and improvement of organizational preparedness. The use of telehealth can adapt to schedule better, reduce travel time to go to service center, and improve privacy.

This section consists of the main discussion and sub-discussion. The writer needs to pay attention that the main discussion adjusted with problem formulations, meanwhile the sub-discussion section uses *headings* no more than 3 (three) levels. For clarity, the results section and discussions are presented as follows.

CONCLUSION

This study reveals that mobile health (mH) technologies exert a transformative impact on Women Living with HIV/AIDS (WLHA), particularly in terms of improving their knowledge, attitudes, access, participation, decision-making, and health-related behaviors.

These changes also extend to medical personnel engaged in service provision. Although gender inequalities persist—manifesting through men's dominance in digital health literacy, negative societal stigma, and discriminatory treatment by both health workers and the general public—WLHA, the wider community, and medical personnel in Surakarta have actively accessed and participated in mH platforms. These findings underscore the potential of mH interventions in addressing persistent gender disparities in healthcare access. The study provides strong evidence that mH enhances the autonomy and wellbeing of WLHA by facilitating more accessible and responsive healthcare environments.

The significance of this research lies in its contribution to understanding how digital health interventions intersect with gendered health experiences in low-to-middle income country settings. It adds to existing literature by empirically validating the role of digital-based healthcare services, such as telemedicine, telenursing, and telepharmacy, in expanding equitable access to care for marginalized groups. By applying Harvard's gender analysis model, this study offers a structured understanding of how digital health platforms can redistribute healthcare access and control in ways that challenge structural inequalities. Furthermore, it highlights the importance of community-centered digital interventions, peer group involvement, and participatory telehealth services in reinforcing health equity. These insights provide practical guidance for policy makers and health practitioners in designing inclusive health programs that are both gender-sensitive and digitally adaptive.

Despite its contributions, this study is not without limitations. The findings are specific to the context of Surakarta and may not be fully generalizable to broader populations due to variations in digital literacy, infrastructure, and sociocultural dynamics. Moreover, challenges remain, including limited access to technological resources, low digital literacy among WLHA, socioeconomic disparities, and inadequate provider-client engagement in telehealth environments. Future research should therefore focus on longitudinal and multi-site studies to validate and extend these findings across different regional and cultural settings. It is also critical to explore strategies for enhancing user empowerment, strengthening healthcare provider training in gender-responsive care, and improving institutional readiness to ensure the scalability and sustainability of mH services for WLHA.

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