

The Effectiveness of Face-To-Face Counseling and Telenursing on the Drug Adherence for Individuals Suffering From HIV/AIDS

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ABSTRACT

This research compares the intervention effectiveness of face-to-face counseling and telenursing method on the Anti-Retroviral medicine consumption adherence for individuals suffering from HIV/AIDS.

The method: researchers explored the data from EBSCOHost, science direct, ProQuest, springer nature, and PubMed within the period of 2018 and 2022. The exploration found 1.521 journal articles plus their abstracts. Out of 1.521 journal articles, the researchers found 10 articles examining the effectiveness of counseling-based digital media for both computers and applications on mobile.

Results: 10 studies used the mHealth platform, virtual counseling, digital media, computer-based technology, and mobile. The assessments on the ARV medicine consumption adherence applied CD₄ and viral load checkup. On the other hand, the researchers found the assessment of the ARV medicine consumption adherence applied Electronic Dose Monitoring, EDM, to examine the missing doses. The researchers found electronic pill monitoring or eCAP to examine ARV medicine consumption adherence. The other assessment was the Visual Analog Scale, VAS, to report the side effects. Then, the last assessment was an autonomous self-report to remind the medical visits via phone calls.

Conclusion: face-to-face counseling allows counselors to examine the clients' responses, transmission risk, and ARV medication hindrances directly. The counselors could also find the solution to deal with the problems and

observe the allergic reactions to the medication or other complaints due to immunosuppressive. The researchers also concluded that technology could facilitate the service distance, save time and cost, provide accessible health, provide nursing health care, provide immediate responses, and become the support system for the clients to consume the medicines. However, the roles of face-to-face counseling are irreplaceable.

Keywords: [Counseling, telenursing, drug adherence, HIV/AIDS]

INTRODUCTION

Human Immunodeficiency Virus, HIV, refers to aggressive and destructive infections against human immunity, specifically the white blood cell or CD4 cell (T-cell). Along with the disease development, opportunistic infections may occur, such as losing weight drastically, chronic diarrhea with unclear causes repeated oral candidiasis, and cancers, as observed in the phase of AIDS, Acquired Immune Deficiency Syndrome. (1)

Anti Retroviral (ARV) is an effective clinical intervention to control HIV replications. (2),(3) Therefore, the patient's adherence to treatment is important to suppress HIV. Viral suppression prevents medicine resistance and pain. Therefore, individuals can improve their life quality, prevent HIV transmission to other individuals, and lower the mortality rate. (4)

The importance of sustainable and consistent medicine consumption adherence to suppress the virus and HIV transmission requires high adherence, more than 95%. Thus, ARV medicine must be consumed punctually without any missing for the rest of the individual's life. Unfortunately, many patients did not commit to consuming the medicine regularly, and this influenced their resistance (3)

Medicine consumption adherence refers to the capability of individuals to obey and implement the therapeutic recommendation by medicine providers, starting from the drinking method, consumption time, consumption frequency, and dose. (5)

Low ARV medicine consumption occurs due to the fear of being isolated and neglected. This problem occurs due to community stigma, discrimination, depression, lack of HIV awareness, and lack of social support. (6) The adherence to consuming ARV medicine maximizes the viral load suppression in the body, prevents damage to CD4, and hinders the AIDS stages. (7)

The initial care and treatment after HIV diagnosis are important to control the disease and decrease HIV transmission. The care and the treatment are also useful to improve the life quality of individuals suffering from HIV. The WHO recommends these individuals get counseling to manage their anxiety. (8)(9)

Based on Indonesia's Dictionary, counseling refers to guiding experts for individuals. The guidance applies the psychological method to direct and assist the clients. Thus, the clients can understand their skills, improve themselves, and solve problems. The counselor provides ART counseling to improve the patient's awareness of HIV, prepare the patients, and provide the principles of long-life medicine adherence. The principles of ART counseling are: focused on the client's needs accurately and adequately, provide information about HIV, provide information about medicine consumption adherence and resistance, support the emotional aspect of HIV clients

to live and encourage the supportive medication for seeking emotional support from the spouses(10).

The implementation of recent technology has fast development in telehealth. The supportive health technology for patients' medication management can be integrated with various media, such as mobile health(mHealth)(11) and telenursing(12). Telenursing refers to the implementation of technology to provide telecare and actions for patients based on their needs. (12).

HIV/AIDS problems also encounter problems to prevent, medicate, and provide health care. One of the crucial problems is - consuming ARV medicine. ARV therapy program, in the long-term, requires the patients' commitment to consume the medicine punctually and discipline with a strict consumption schedule. The consumption cannot be missed because the medicine is useful to suppress the virus development. Therefore, further innovations from various disciplines are important to medicate and prevent HIV transmission. The other method to ensure medicine consumption medication and promotes the efforts of preventing secondary HIV risks involves preventive HIV behavior and behavioral changes by using technology. In this research, the researchers focused on the effectiveness differences of face-to-face counseling and telenursing on the ARV medicine consumption adherence of individuals suffering from HIV/AIDS.

MATERIALS & METHODS

From the background, the researchers analyzed the effectiveness of intervention between face-to-face counseling and telenursing on ARV medicine consumption adherence for individuals suffering from HIV with a literature review approach. This literature review used some databases, such as EBSCOHost, science direct, ProQuest, springer nature, and Pubmed, to find international journal articles and national journal articles. The databases were also useful to find other sources, such as news directories to support the research

comprehensiveness. In this case, the applied keywords were "Telehealth," or "telenursing," and "HIV/AIDS," and "face-to-face," or counseling," and "adherence." The articles should be published between 2018 and 2022 and written in Indonesian language and English.

The researchers explored the literature with a randomized controlled trial. The results were articles based on the criteria in the journal article database. In this process, the researchers found 10 relevant articles.

RESULT

This literature review summarized 10 relevant articles about the effectiveness of standard counseling as the reference of mHealth or mobile health-based technology application. Then, the researchers compared the effectiveness of the application with the standard counseling attempt to improve ART adherence. In this research, the researchers also investigated the combination of mHealth with medicine reminders, electronic signaling to remind medicine consumption, and identification of ART adherence against the challenges. From the research articles, the researchers found research that applied intervention and control group with the implementation of digital-based Internet. This researcher differentiated the intervention group with virtual group counseling via the Telegram application. (13) The other nine studies provided intervention with some media, such as the mHealth platform (10,15–17), virtual counseling (18), digital media application (19,20), computer-based implementation (21), and cellular phones. (19) The researchers summarized the medicine consumption adherence with CD4 and viral load checkup (10,15–17,19–21). The researchers also found a technique to measure the patients' adherence. (13) The other measurements were the implementation of Electronic Dose Monitoring (EDM) to remind the missing

doses. (14) Electronic Pill Monitoring was useful to check ARV consumption adherence via Electronic Monitoring called eCAP.(21,22) Then, the researchers also found the implementation of the Visual Analog Scale, VAS, to check the side effects or to report the medicine consumption independently. (21) The reminded utilized phone calls. (20) On the other hand, the measurement of adherence levels to check the patients' pre-exposure prophylaxis on YMSM and YTGW PrEP with TEVDP measurement in the third and sixth months.

The PrEP adherence was correlated with the TFV-DP level for more than 700 fmol/punch (14), the checkup of CD4 cellular amount and viral suppression (19), the ART adherence for chronic medication with the questionnaire of AIDS Clinical Trial Group adherence or ACTG.(23)

Many inpatient patients have limited experience and are unreadiness to have long-term medicine consumption commitments (51, 52, 53). The first years for newly cared individuals are the vulnerable and critical moment for the individuals to adapt (54). Specifically, individuals suffering from HIV began their ART to suppress the viral load (VI) and optimize their health (51,54-44).

The appearing stigma related to HIV becomes the hindering factor for individuals to keep their HIV medication adherence. This stigma is a complex social process in which individuals suffering from HIV received negative prejudice, de-evaluation, discrimination, denial, and other negative attitudes because of their life suffering from HIV. This matter makes the individuals suffering from HIV delay their efforts of seeking HIV health care services and ART. Thus, they miss the clinical visit which leads to delayed VL suppression, viral load, cumulative rate, and increased mortality and morbidity.

Table 1 study population, design, interventions, outcomes, and results

| Author, year, study location | Study population, sample size (screened, enrolled, completed, followed) | Study design | Main intervention and comparison/control | Outcome measures: Viral Load | Outcome measures: other symptoms | Results: Viral Load | Results: other symptoms |
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| H. Gouse, 2018, primary health care clinic in Cape Town South Africa's. | Intervention N= 250 patients with HIV diagnosis. Control: N=337 patients | The research applied randomized controlled trials; September 2012 until May 2017; pre-post-intervention study design. The researchers trained the counselors to use <i>masivukeni</i> (a based on the local culture and language). The average duration for each minute per counseling session was 42 with an SD of 20.04 for the first session, 39 minutes with an SD of 21.08 for the second session, and 49 minutes with an SD of 27.15 for the third session | Intervention: The primary intervention was the application of <i>masivukeni</i> , a multimedia counseling application Control: a study on a standard of care (SOC) | The viral load measurement becomes the viral suppression results. | the patients' awareness about HIV and ART The patients' attitudes toward the ART The anxiety and depression levels calculated | After 12 months, 90% of the patients, 337 out of 456 women (73%), with an average age of 33 years old, within the group of <i>masivukeni</i> and the group of a standard of care (SOC), could reach the viral load suppression lower than 400 copies/mL. The patients received the <i>masivukeni</i> more than 12 times. The patients might suffer from high VL suppression than those with the standard of care. | AFTER the intervention, patients suffering from HIV/AIDS had significant awareness, attitudes and anxiety depression cognitive p-value 0.001. The counselors also reported that they were more confident and could provide better counseling after applying <i>masivukeni</i> application. The research showed more patients with <i>masivukeni</i> began their ART medication than the control group. |
| Amico et al, 2022 United States (US) | Screened (n=108): The unlisted (n=19), HIV-1 RNA lower than 200 cp/ml (n=15), patients without consuming the pill/day (n=1), tarv for more than 24 weeks before HIV-1, RNA higher than 200 cp/ml (n=2), having no clinical visit (n=3) Randomization (n=89) The | The researcher used a randomized controlled trial, RCT; distant-medication reminder intervention for the intervention group or standard care for the control group. The research target consisted of 120 youngsters taken randomly with equal | Intervention: The intervention group received distant medication reminders from the cellular application, mHealth, and the distant counseling training to improve Anti Retroviral therapy adherence; 12 weeks by a trainer based on the applied schedule as shown in Vsee, a video conference platform, at the beginning of the clinical visit. Control: | The virology suppression is defined as the HIV-1 plasma, RNA lower than 200 copies/ml in the twelfth week (\pm 2 weeks). The failure is defined as the HIV-1 in the twelfth week, RNA lower than 200 copies/ml without viral load test. | The adherence level on the medicine (self-reported) The life quality related to health (counted with a questionnaire) The correlation with the care (counted with a questionnaire) | The intervention group showed a significant decrease in viral load than the control group in the twenty-fourth week with the baseline (average mean of -0,56 log10 copies/ mL vs. -0,06 log10 copies/ mL, p = 0,01). The intervention effect of weekly | The intervention group had a significant improvement in terms of medication adherence, p-value lower than 0.0001. The related-health quality life obtained a p-value of 0.005 with a correlation toward care (p-value = 0.004) than the control group. |

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| | <p>intervention: (n=43), the control group: (n=46), expelled from the system 1. Intervention n=43 Complete n=38 Incomplete n=5 Control n=43 Complete n=43 Incomplete n=2 Pre-covid Intervention n=38 Complete n = 22, Incomplete n=3 Control n=43 Complete n = 17, Incomplete n= 10</p> <p>Stopped post-covid 19 studies, Intervention n=32, complete n = 10, loss follow up = 3, Control n=31, complete n = 14, loss follow up = 2 Total sampel N=63 Intervention (n=32) The control group: (n=31)</p> | <p>probability. Thus, the probability was the same for the TERA group and SOC group.</p> | Standard of Care | | | <p>viral suppression in the twenty-fourth week showed 36 and 48 women had lower viral suppression than males with HIV-1, with RNA lower than 200 copies/mL. The women and the male had RR of 0.69, 95%, and CI of 0.45. (1,05 CI 0,45, 1,05; p = 0,09 and HIV-1 RNA < 50 copies/mL = 0,63, 95% CI 0,38, 1,03, p = 0,07).</p> | |
| <p>Kurth et al., 2019 Kenya.</p> | <p>586 people from two research sites; 236 people agreed (40% accepting); 236 were randomized and finished the initial assessment; and a percentage of 95% or 225 people maintained their RCT for 9 months.</p> | <p>The researcher used a randomized controlled trial, RCT; From September 1, 2011, until July 12, 2012, the follow-up continued until April 2013 while the implementation phase was in 2014.</p> <p>Intervention (n=118)</p> | <p>The intervention: CARE+ counseling in Keya was tablet; guided by the counseling; 30 until 60 minutes intervention Control: The consultation only received a direct assessment of behaviors; 15 minutes. Each group had a total of four sessions for 3 months.</p> | <p>Viral Load HIV-1; Electronic monitoring; The log-10 evaluation found different viral loads between the control and intervention groups with samples from both groups to measure the HIV-1 viral loads in the first and ninth</p> | <p>Self reporting sexual activity without condoms Urine lab. checked</p> | <p>The control group had a decreased viral load of more than 0.5 log10 and was clinically and statistically significant (p=0.0007). The viral load in the intervention phase was 0.96 vs 1.54. In the control group (0.80 vs 1.34). The viral</p> | <p>The report showed the intervention group of sexual behavior: control Sexual intercourse of 56% for each group Using a condom for 34%: 35% Using broken condoms of 97%:96% Violent intercourse with the spouses, 9%: 12% Violent intercourse with other spouses:</p> |

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| | | control (n=118) The risk assessment and were followed up for 9 months with retention of 95.3%. | | months. | | load was significantly lower after nine months than the viral load at early intervention. The autonomous reported VAS by the intervention group; the VAS adherence of the control group was between 77 and 99: 88-99 (90:95) VAS scale higher than 95% was 44%: 55% Log 10 HIV-1 viral load mean (1.56: 1.36) Undetected viral load, 6%: 67% | 0%1% The urine check was useful to measure the communicable sexual infection of the intervention group: the control group Chlamydia, each with 2% Gonorrhoea, each with 3% T. vaginalis, each with 4%: 9% On the other hand, the missing clinical visits of both groups were 83%: 76 % |
| YIGIT et al, 2022, USA | 941 participants were enlisted and screened. 573 participants were not active. 183 participants did not agree. 14 participants agreed but they did not enlist:4 | The researcher used a randomized controlled trial, RCT; The intervention group (N=185); the control group (N=186) | The intervention group: The patients received four sessions of face-to-face meetings (0-2, 2-12, 12-24, and 24-48 weeks after the randomization); The participants received personal contact calls, visit reminder call, and missing visit call during the research. The control group: the standard care including strategies to support adherence and ART retention during the care, such as illustrative matters to provide information and encourage the participants to store the reserve doses in certain places | Viral suppression for 48 weeks | The followed up assessment in the 48 th week found the connection with internalized HIV stigma, depression symptoms, coping, and mechanism as the secondary results. The intervention influenced the internalized HIV stigma change. | The viral load in the 48 th week of 314 participants was 85% of the iENGAGE sample, including 155 participants from the intervention group (84%) and 159 participants from the control group (85%). The results showed strong retention. | The measurement of RM. ANOVA: The significant primary time effect, $F(1,298) = p = 0.002, \eta^2 p = 0.03$, indicated HIV stigma during the follow-up period ($M = 2.17, SD = 0.73$). The follow-up on the intervention group found a decrease in HIV stigma from the initial condition. The control group had no significant differences between the initial and the follow-up conditions in terms of HIV stigma. The primary effect of depression against the decreased HIV stigma was internalized insignificantly. |

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| <p>Songtaewe in et al. 2020, Thailand</p> | <p>Research time March 2018 to June 2019 489 listed adolescents, 147 YMSM participants, 74%; 53 YTGW (26%); 27 positive HIV patients (6%) Sample 200 (41%) intervention =100 control= 100</p> | <p>The study design: The randomized control test pre-exposure prophylaxis, PrEP; and a specific cellular-designed application to improve PrEP adherence. mobile phone app, YFS + APP on the clinical months of 0, 1, 3, and 6. The researchers also called the participants in the second, fourth, and fifth months.</p> | <p>The intervention: Receiving Youth-Friendly Services Plus App The control group: The control group received YFS with the adjusted topic based on the individuals' needs, starting from education, sex orientation (lesbian, gay, bisexual, and transgender), stigma, discrimination, mental health problem, compound abuse, and specialist reference. All clients had access to trans-gender counseling and related blood test to confirm the gender and hormonal therapy</p> | <p>PrEP adherence was measured by TFVDP in the third and sixth months. The determined PrEP adherences were about the participants' TF-DP level, higher than 2700 fml/punch</p> | <p>Measured by: HIV infection level, Retention level study on the sixth month, and the related PrEP adherence factor The risk protection of HIV transmission was consistent (100% condom consistency)</p> | <p>The PrEP adherence in the third month was: 51% on YFS and 54% on YFS + APP (p-value of 0,64) The PrEP adherence in the sixth month was: 44% on YFS and 49% on YFS + APP (p-value of 0,54) The PrEP adherence levels by TFDVP were on the third month = (95% CI 45 -60) and On the sixth month = 6 =48% (95% CI 39-55) The PrEP adherence was: on the third month with 51%, receiving YFS and 54% for YFS + APP (p = 0.65); then on the sixth month with 44%, receiving YFS and 49% for YFS + APP (p = 0.54)</p> | <p>The HIV infection level; is 27 with positive HIV (6%) 13% of participants reported the recent 3 months of consuming drugs The respondents also reported their habits of drinking alcohol (6%), amphetamine or methamphetamine (4%), ketamine (0.5%), popper (the evaporated alkyl nitrite 5%), cannabis (2%), and sildenafil citrate (4%). The retention level on the sixth month was 73%, observed on the sixth-month follow-up, 72% on YFS, and 73% on YFS + APP (p=0.87). The condom application was consistent, for 34% (95% CL 25 until 43) in the beginning into 58% (85% CL 49 until 68) in the third month with a p-value lower than 0.0001. In the sixth month, the value became 52%; 95% CL, 41 until 62.</p> |
| <p>Jiao et al. 2022 China.</p> | <p>The respondents were males having sexual intercourse with males suffering from HIV. from October 19, 2020, to June 31, 2021. n=576 Intervention: n = 288; Control n = 288 Three</p> | <p>The study design: The randomized-controlled intervention test: The participants could choose one of three digital strategies, starting from the textual message, instant message, or instant and social media</p> | <p><u>The intervention:</u> received different care with the assistance of information and communication technology, including the SMS-based reminder and ICT counseling service support to improve ART therapy adherence. <u>Control:</u> received standard care with direct reminders and</p> | <p>The Viral Load Measurement The ART adherence level The T-cell or CD₄ cell amount checkup, viral suppression, and</p> | <p>of life quality based on the WHOQOL-BREF questionnaire. self-efficacy,</p> | <p>The intervention group reported highly improved adherence toward ART than the control group's adherence in the third month (99,3% vs 94,2%, p=0.047) and sixth month</p> | <p>The self-efficacy of the ARV medication adherence for each textual-based intervention was 1.24 (-1.55, 4.02), the instant-based message intervention with 1.67 (-0.26, 3.61), and the combined intervention of instant and social media</p> |

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| | <p>month-follow up, n = 241 Intervention: n = 288; Control, n = 259, Six months follow-up, n = 245 Intervention: n = 245; Control n = 256</p> | <p>message. WeChat was for instant messages and QQ was for social media message</p> | <p>face-to-face counseling. The participants also received additional messages, such as behavioral health and nutritional health, based on routine care.</p> | | | <p>(97,1% vs 83,0%, p<0,001). After the intervention , the participant proportion reaching the optimum ART adherence was high for the intervention group (82.9% vs 71.1%). The different digital interventions had significant improvement in ART adherence (RR = 1,74, 95%CI 1,21–2,50). Viral Load: the intervention group members had a higher decreased the control group's viral load median (-2,06 vs -1,59 log10 copies/mL, p<0,001).</p> | <p>with 0.27 (-3.45, 3.99). The life quality scores: text-based intervention - 1.50 (-3.24, 0.25), instant message-based intervention with 0.85 (-0.43, 2.13), and the combined intervention between instant and social media group with 1.66 (-0.16, 3.47). The result showed no significant difference between the intervention and control groups in terms of life quality score.</p> |
| <p>Schnall et al. 2018 New York USA</p> | <p>N = 80, Control n = 40 lost to follow-up n=1 Having no follow-up schedule, n=1 Intervensi n=40 lost to follow up n=3 Having no follow-up schedule, n=2 Obstructed intervention, n=1</p> | <p>A randomized clinical; recruited the respondents via local brochures, HIV clinics, community-based organizations , and invitation emails; the research assistant assessed the respondents in terms of reliability based on the inclusion criteria.</p> | <p>The intervention group: mVIP with self-care strategy The control group: mVIP without self-care strategy Both groups received access to the mVIP application on their smartphones</p> | <p>The CD₄ amount Viral Load</p> | <p>The reported frequency of the participants Indicating symptoms on life quality</p> | <p>The CD₄ amount > 500 The total amount: (n=42) (53,2%) The intervention group (n=40) was 22, 55.0% The control group (n = 40) was 20, 51.3% Virologically Desuppressed The total amount: (n=68) (85,0%) The intervention group (n=40) was</p> | <p>intervention: Fatigue (n = 61, 76,3%), Having insomnia (n = 59, 74,7%), Neuropathy (n = 46, 59.0%) Anxiety (n = 45, 57,0%), Depression (n = 43, 53,8%). The control: Anxiety (p = 0.001). Depression (p = 0,001), Neuropathy (p = 0.002), Fever, chilling, and sweating (p = 0.037), and Losing weight (p = 0.020) The control group indicated higher nausea and vomiting than the</p> |

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| | | | | | | 34, 85.0% The control group (n = 40) was 34, 81.0% | intervention group insignificantly. |
| Magidson et al., 2022 Northeast Washington DC, USA | Client interviewed and screened for study participation N=878 Completed baseline assessment and randomized N=61 Intervention N= 32 participants Control: N=29 participants | controlled-random clinical test; participants randomly and in parallel (1:1) to receive one of Act Healthy (AH; BA+life Steps or (2) Supportive Counseling, SC+Life Steps). | Intervention: Healthy (BA + Life-Steps)—Act Healthy Combined BA to use compound, LETS ACT, with the immediate problem-solving intervention for HIV-related self-care, including the initiation of ART, adherence, and sustainable involvement in the care (Life-steps). Control: Supportive Counseling (SC) + Life-Steps SC | The results of the ART adherence in terms of chronic medication required the adherence questionnaire of AIDS Clinical Trial Group, ACTG. | These compound administrations were assessed by two measurements: The urine screening was done with 5-panel parallel cups of E-Z split to examine the cocaine, amphetamines, phencyclidine (PCP), tetrahydrocannabinol (THC), and opiates. The participants reported depression symptoms with 21 Back Depression inventory items. The motivation for using compound administration applied compound administration measurement with a Conditional Scale. | The results showed a significant difference between the groups' intercepts (SC=13.05, AH = 6.86, $p = 0.009$). The mean of the follow-up action was 67%, n = 41. The assessment for six months was 61%, n = 37. Both groups had a significant increase from 57% to 86%. | The problems of administrating cocaine (56.7%), alcohol (31.7%), and opioids (25%). Here are the visits of the last follow-up assessment: 67% (n = 41) for the six-month follow-up and 61% (n = 37) for the twelve-month follow-up. The compound administration; the OR compared the importance level of each primary point of time between AH and SC, ranging between 0.42 (0.10, 1.68) - 2.52 (0.56, 9.83). |
| Gross et al., 2022 Afrika, Asia, dan Amerika | 1091 participants were reliable. 546 participants were excluded because 351 participants did not meet the inclusion criteria RNA, HIV-1; 45 participants had closed screening, and 150 participants had different reasons. 545 primary study, 24 participants were excluded; n=257 MPI group n=264 SOS group | controlled-randomized design to compare the intervention effect of the active behavior group and the control group (1:1). The Internet web-based computer in the central computer, the researchers took a participant randomly from the group receiving phone calls plus standard of care (MPI + SOC) or the group receiving only standard of care, SOC. | The intervention: the intervention of phone call plus local standard of care adherence support (MPI + SOC) The control group: participants receiving only standard of care, SOC. | Viral Load (log10/) The measurement of RNA HIV-1 = 200 exemplars per mL or less than the forty-eighth week in both groups. Continuing the second-phase ART | The virological failure time, other symptoms (scales between 0 - 10) The CD ₄ changes The ART adherence and the reported side-effects | After 48 weeks, the researchers found no significant differences in terms of viral load between the intervention and control groups (the mean difference: 0,01; 95% CI, -0,09 until 0,10; P = 0,85) Patients with ≤ 200 exemplars per mL on the forty-eighth week The group of MPI + SOC = 169/257 (66%) The SOC group = 164/264 (62%) | The scores of other significantly decreased symptoms in both groups (the intervention group: average decrease of 1.42; the control group: average decrease of 1.47), the mean differences: 0,05; 95% CI, -0,19 until 0,29; P = 0,67 The virological failure time The group of MPI + SOC = 66/257 (26%) The SOC group = 89/264 (34%) Continuing the second phase ART MPI + SOC= 60/133 (45%) The SOC group = 75/136 (55%) The CD ₄ Amount Change The personal counseling |

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| | | | | | | Continuing the second phase ART The group of MPI + SOC = 60/133 (45%) The SOC group = 55/136 (40%) | after the ART changes (94%-100%) personal counseling before or during the ART changes (94%) The immediate services at clinics (7-82%) The pill calculation; 71%-82% The transport change (58%-71%) The phone call follow-up (47%-59%), and HIV education for families/friends (41%-47%) |
| Mogart et al., 2022. Atlanta, USA | The population consisted of black African American adults living with HIV and receiving ARV. The research lasted from January 2018 to December 2021 The recruitment: January 2018 to July 2020 Intervention group: n = 85 Control group: n = 81 | randomized controlled trial, RCT; two group, intervention and control The assessment of adherence ended in June 2021; the viral load assessment Ended by the medical record on December 2021 | Intervention: The intervention session was led by a peer counselor from black people; two-day training with basic MI patterns (reflective and educative) for 6 months in 5 sessions. Intervention group received routine and sustainable care from the health care provider and received an ART prescription. | The researchers took the blood with a venipuncture technique to determine the HIV viral load in FQHC, an HIV service organization, before the pandemic. During the pandemic, the services were absent so the participants were accompanied by transport service to the local laboratory. Besides that, the participants reported the dates and the HIV viral load test results at the beginning of the research and the follow-up. | The adherence assessment of consuming the medicine with MEMs lasted daily and electronically for 1 until 3 months. The researchers used the MEMs cap to record the dates and the times of unsealing the bottles. The researchers also analyzed the other HIV symptoms as secondary results. | More than 80% of participants had viral suppression and a percentage of 61% had used 75% of the prescribed dose. The autonomous report of viral suppression obtained a percentage of 71.7% found in the control group and the intervention group a percentage of 73.9%. The rising effect of adherence was stronger for younger patients with log-odds (se) = y 0.06 (0.03), p = 0.03. For participants aged 1-year-old, the SD was below the average. The intervention effect was stronger | The results showed 75% adherence was highly found in the intervention group than the control group OR (95% CI)=2.0 (1.1-3.6), p=0.03, Cohen's d=0.4; 29% of respondents were positive to suffer from depression; stigma; and The serostatus of HIV baseline: the follow-up lasted 13 months for the intervention group with a percentage of 96.0%: 96.6% while the control group had percentages: of 96.7%: and 98.9% |

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| | | | | | | <p>[OR (95% CI)=5.4 (1.7–17.0), p=0.004] than the younger ages with [OR (95% CI) = 1.7 (0.9–3.1), p=0.08]. For participants aged 1 year, the SD was higher than the average [OR (95% CI) = 1,5 (0,8–2,8), p=0,18].</p> |
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Remarks: TERA (*Triggered Escalating Remote Coaching Adherence*), the *standard of care* (SOC), act healthy (AH), electronic monitoring (eCAPs), Text Message (PT), Instant Message (Pi), Instant Message + Social Media Group (Pi+smg), Intervention (I), Control (K), Pass Away (m), loss follow up (lfu), MI(), mobile phone intervention (MPI), Medication Event Monitoring System (MEMS)

The research sites: Southern Africa (10), the United States of America (15,17,20,21,23) Thailand (14) Colombia (16), Kenya (21), Brazil, Haiti, India, Kenya, Malawi, Southern Africa, Thailand, Uganda, Zimbabwe (17) various studies discussed the potentials of phone applications for patients with chronic diseases. The mHelath technology was an effective medium to improve the excellent results for chronic diseases (24). The studies lasted from nine months (21) until five years (9, 21). The researchers recruited with various methods, including advertisement on the Internet(22), Facebook (22), partnership (22), counselor (14), online advertisement (14), community clinic brochure (16,17,21,22), and referral places (22). The male respondents 76%, gay or bisexual respondents were 71%(22), males were 52% (17), males 55% (15), males with 5% from the intervention group; males from the control group 19% female with 75% on the intervention group; females with 81% from the control group (21), males with 79,2% from the intervention group and 78,9% from the control group (20), males with 37,5% from the intervention group and 57,5% from the control group (16), female respondents with 53% (23), YMSM 74% and YTGW 26% (14).

THE ARV MEDICINE ADHERENCE

The ART optimum adherence is defined as the action of not missing any single doses or delayed doses for more than one hour within a period of a month (19). The ARV medicine adherence must be higher than 95%, indicating the medicine is consumed correctly based on the doses, manner, and time by health professionals as the efforts to reach and suppress the virus. Thus, the patients had to obey and be consistent. The disobedience against ART therapy caused HIV medication failure (14). Previous studies showed that untreated HIV and ART side effects could cause various symptoms. ART medicine could contribute to the inconvenience of the patients.

THE ADHERENCE MEASURING TOOL

The assessment of medicine consumption could be measured based on the HIV viral load or with the developed MEMS Cap; the daily medication adherence was monitored electronically within a certain period with closed MEMS. The MEMS were unsealed and recorded based on the dates and times of unsealing the caps. The autonomous reports of the blood checkup, and venipuncture, were useful to examine the HIV viral load. When the services were absent, the laboratory test was important to

check the HIV viral load. The autonomous assessment indicated the participants autonomously reported the dates and the test results of HIV viral loads in the initial assessment and follow-up assessment.

The other assessments were measured by collecting the unsealed caps from EDM Smart Bottle that recorded the dates and times of unsealing the devices and sending the information online into the data collection dashboard via a cellular network. The other measurements of adherence to ART medicine applied ACTG questionnaire, adherence for any chronic medication using the AIDS clinical trial group. High scores indicated high missing dose frequency.

The Virology Suppression

Virological suppression refers to RNA HIV-1 plasma check-up for less than 200 copies/ml in the twelfth week (± 2 weeks) while virological failure is defined as RNA HIV-1 in the twelfth week for more than 200 copies/ml or having no viral load test (25). The results in Kenya showed that both groups had decreased viral loads, higher than 0.5 log₁₀ from time to time. This finding was clinically, significantly, and statistically relevant ($p=0.0007$). Viral load for intervention (0,96, SE=0,16 vs. 1,54, SE=0,18) while the control group was (0,80, SE=0,15 vs 1,34, SE=0,16) significantly lower in the ninth month than at the beginning of the research (21).

The research in America involved black American adults and found that viral suppression via venipuncture was 82.6% in the control group. For the intervention group, the obtained percentage was 81.1%. In terms of self-reporting, the control group obtained a percentage of 71.7% while the intervention group obtained a percentage of 73.9% (22).

CD4 Check Up

The check-up found a higher CD4 level in 500 participants from the intervention group, 55.0%. For the control group, the obtained percentage was 51.3% (16). The

other researchers in various countries were useful to compare the intervention and the control groups; Brazil with 10%: 9%, Haiti 8%: 9%, India with 28%: 22%, Kenya with 10%: 12%, Malawi 7%: 7%, Southern Africa 15%: 17%, Thailand 2%: 5%, Uganda 16%: 15%, Zimbabwe 4%: 4% (17).

The Risky Behaviors of HIV Transmission

The consistency of applying condoms for the intervention group was only 33% while the control group was higher, 35%. The percentages were contrasting toward the inconsistency of applying condoms for the intervention group, 67%. On the other hand, the inconsistency of applying condoms for the control group was 65% (14). The possible interruptions of consuming alcohol in the intervention group were 37.5% while the control group was 25.0% (16). The measurement of compound consumption was with urinary technology and timeline follow-back (TFLB) to assess the consumption of cocaine, amphetamine, phencyclidine (PCP) tetrahydrocannabinol (THC), and opiates.

DISCUSSION

The examined intervention was explained clearly and required adaptive design to improve medicine consumption adherence. This action was useful to objectively apply and to provide easy access for all participants without having direct interaction with the researchers. Thus, the participants' positive behaviors would be positive.

The viral suppression effects did not occur significantly in the intervention group due to the focused intervention on solving the problems. For the adolescents, the detected viral load had worsening negative consequences, including worsening clinical results, such as AIDS, inpatient, mortality, chronic inflammation, repeated virological failure, and sexual disease transmission (25).

The researchers carried out the research during COVID-19. Thus, the situation indirectly hindered the sample collection step although the hindering effects were not proven. The respondents were expected to report their developments. Thus, the research results might be biased because some respondents did not report.

The measuring method of the intervention results had to be valid and reliable, by using the trusted measurement to measure the medicine consumption adherence. The viral load measurement and the CD₄ amount measurements on the individuals with different characteristics in each country required a relatively long time. The processes were also different so the results could not be generalized. Thus, the results should be considered at certain stadiums based on the respondents' conditions.

The autonomous data collection was guided by the application of the symptoms and the side effects of ARV. These matters provided an evidence-based nursing strategy that was modified to support it. The management of the medicine's side effects influenced the individual adherence to the medication because of the potential side effects of ARV.

The sampling of ARV medicine had irregular times that could change the pharmacokinetic and pharmacodynamic effects of the medicine. Thus, further monitoring and reminder were important to provide an equal dose and maximum effects of ARV medication.

The research results recommended the participation to prevent HIV transmission to save the spouses or other HIV substitutions. One of them is by having campaigns about a condom because the consistency to use condoms should be maximized.

The HIV stigma became a hindering problem for individuals suffering from HIV/AIDS to have ARV medication. This problem must be solved, for example in terms of management. The solutions might include providing information, motivation, and behavior to obey the care and ART.

The other reported symptoms in this research were a significant decrease in depression and compound administration in the third and sixth months after the intervention than the control group.

The counseling of medicine consumption adherence became the key to ART medication. Thus, this medication required counseling standard implementation. Preparing individuals to get ART could provide awareness about the importance of ART to suppress HIV.

CONCLUSION

This literature review showed that ARV medication was correlated to medicine consumption behavior based on accurate medical suggestions. Telenursing was effective to improve the clients' intention to consume the medicine and to mediate the health facility distance problems. The application designs should be convenient and easy to use. The applied language should be understandable. The application should be able to be downloaded via Android. These became the alternatives to improve medicine consumption adherence. Future studies should create appropriate application models for all age levels and sex types. This development facilitates our understanding of the friendly application for children and adolescents. The application could be adopted by various backgrounds and is applicable and understandable for all communities.

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