ISSN 2354-8428
e-ISSN 2598-8727

JURNAL KEPERAWATAN

KOMPREHENSIF

COMPREHENSIVE NURSING JOURNAL

Published by :

Sekolah Tinggi Ilmu Keperawatan
PPNI Jawa Barat

Vol. 10 No. 3, July 2024

JURNAL KEPERAWATAN KOMPREHENSIF	VOL. 10	NO. 3	Bandung July 2024	ISSN 2354-8428	e-ISSN 2598-8727

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

Research Article

The Effect of Social Media Application-Based Interventions on HIV Adherence to ARV Medication among Patients with HIV

Eva Herawati[1]* | Irna Nursanti[1] | Diana Irawati[1] | Dhea Natashia[1] | Sri Utami Damayanti[1]

[1]Fakultas Ilmu Keperawatan Universitas Muhammadiyah Jakarta. Jakarta, Indonesia

***contact**

eva.herawati04@gmail.com

Received : 31/10/2023
Revised : 27/07/2024
Accepted : 28/07/2024
Online : 31/07/2024
Published : 31/07/2024

Abstract

Aims: The purpose of this study was to determine the effect of health interventions based on social media applications on HIV patients' adherence to taking ARV medication.
Method: In this study, 76 were selected using a quasi-experimental methodology and a purposive sampling technique. then divided into two distinct groups: intervention and control. During the study, respondents in the intervention group received treatment in the form of reminders via WhatsApp and the SiARV web application. The control group was only given standard health services without any technology-based health interventions.
Results: Significant changes in treatment adherence were observed in both the intervention group (p=0.001) and the control group (p=0.001). The difference in treatment adherence between the intervention group and the control group was statistically significant (p=0.040). In the context of multivariate analysis, education was found to be predictive of changes in respondent Adherence (p = 0.019; OR = 3.692).
Discussion: Awareness of ARV adherence can be increased and maintained through SiARV social media as a strategy for reminding and controlling patient adherence
Conclusion: HIV patients' adherence to taking ARV medications is affected by health interventions utilizing social media applications. It is anticipated that providing HIV patients with application-based interventions and a high level of patient knowledge through education will enhance their quality of life.

Keywords:
Adherence, ARV Medication, HIV, Social Media-Based Applications, SiARV

INTRODUCTION

HIV and AIDS continue to be a global health concern, including in Indonesia. UNAIDS (United Nations Program on HIV/AIDS), the WHO agency unit dealing with HIV and AIDS issues, By the end of 2023, 39.9 million individuals worldwide will be HIV positive (1). Southeast Asian HIV cases account for 10% of the global HIV epidemic (2). According to the National Narcotics Agency (BNN) report, throughout 2022 there were 52,955 cases of Human Immunodeficiency Virus (HIV) infection in Indonesia (3). The use of antiretroviral (ARV) therapy represents a pivotal phase in the process of overcoming HIV/AIDS. Antiretroviral therapy (ART) is efficacious in mitigating HIV transmission, as evidenced by the observation that 80% of

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

individuals with HIV who adhered to a twice-daily regimen of antiretroviral medications achieved undetectable viral loads in their bloodstream within a span of six months (4). Prior studies have identified several factors contributing to the low adherence to long-term antiretroviral therapy (ART). These factors include engaging in travel for business or social activities, experiencing stigma associated with HIV, lacking access to or limited exposure to ART adherence education, engaging in alcohol use, and resorting to alternative medicines for HIV treatment. Additional factors to consider are the adverse effects associated with antiretroviral therapy (ART), the phenomenon of treatment tiredness, the notion that prolonged ART usage or divine intervention can lead to the eradication of HIV, and the issue of ensuring food security (5). Adherence to antiretroviral (ARV) medication has been recognized as a crucial factor in achieving positive outcomes during an effective HIV treatment regimen. According to the available data, the rate of antiretroviral (ARV) medication adherence in Indonesia remains substantially low, ranging between 40% and 70%. This prevalence data falls significantly short of the national goal of a 95% adherence rate (6)

Many factors affect Adherence. Therapeutic and health system factors, health system improvements, and health service workers all contribute. UNICEF, KOMINFO, and the Berkman Center for Internet and Society found that 84% of Indonesians have cell phones, indicating that 4 billion people worldwide have internet access, with an increasing number of users. Around 4 billion, 3 billion use social media, and 5 billion use smartphones (7). With the swift advancement of technology, the utilization of technological devices, such as mobile phones, can serve as an efficacious intervention (Hadiyani et al., 2022). Nurses employ social media-based interventions as a means of delivering remote nursing care, utilizing their expertise, knowledge, and critical thinking abilities to support clients. These interventions aim to address issues related to treatment adherence by providing effective and readily accessible solutions. Efforts have been undertaken to enhance Adherence with mobile phone technology to encourage adherence to antiretroviral (ARV) therapy. As a result, it has been shown that over 60 percent of patients derive benefits from the utilization of short message services, such as WhatsApp. A study was conducted in Uganda in the year 2015 (9). Researchers together with RSUD dr. Chasbullah Abdulmadjid Kota Bekasi developed the SiARV web application for compliance in taking medication for HIV patients. The SiARV (Antiretroviral Information System) web application is a digital platform specifically designed to support the management and monitoring of antiretroviral (ARV) therapy for patients living with HIV or AIDS. This application is designed to provide various features and functionalities that help patients and healthcare providers manage HIV conditions effectively.

METHODS

This study used a quasi-experimental design with purposive sampling and two groups, intervention and control. This research was conducted for 1 month. The population consists of non-compliant HIV patients receiving ARV treatment at the Flamboyan Polyclinic for more than six months, and the sample size is 76 respondents. HIV patients over the age of 18 who had been on ARV therapy for more than six months, had an active smartphone and had a drug-taking supervisor met the inclusion criteria for this study. Exclusion criteria include post-treatment patients whose conditions are unstable, patients who have been compliant with medication use within the past three months, and incomplete medical record data.

This research device utilizes the Si ARV Application. The data collection method

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

begins with the provision of detailed instructions on how to use the program. The instrument in this study used the SIARV web app and Whatsapp applications. Respondents logged in to the application and then the researcher filled out the scheduling form according to what was given in the medical record. The medication reminder automatically provides a notification of the medication schedule that will appear in the application connected to WhatsApp before it is time to take the medicine and respondents must immediately click on the application provided immediately after the remainder comes in if the respondent does not immediately click on the application, it will be stated that they took the medicine not on time. Respondents filled out the application every day for 1 month. On the last day (31st) the researcher identified the amount of remaining medication. If there is remaining medication, compliance is calculated using the Proportion of Days Covered (PDC) method, namely the amount of medication taken x 100% divided by the amount of medication in one month. It is said to be compliant if the PDC compliance is ≥90% and is said to be non-compliant if it is <90%. For univariate results, frequency distribution and central tendency are utilized, whereas bivariate analysis uses the t-test and multivariate analysis uses the linear regression test.

RESULTS

Respondent Characteristics,

The results of respondents' characteristics can be seen in Table 1.

Table 1. Respondent Characteristics

Respondent Characteristics	Intervention Group (*n* = 38)			Control Group(n=38)			*p-value*
	f	%		*f*	%		
Gender							
Man	30	78,9		29	76,3		1
Woman	8	21,1		9	23,7		
Married Status							
Not married	12	31,6		16	42,1		0,476
Marry	26	68,4		22	57,9		
Education							
Low	20	52,6		27	71,1		0,157
High	18	47,4		11	28,9		
Work							
Doesn't work	6	15,8		11	28,9		0,271
Work	32	84,2		27	71,1		
	Mean	**SD**	**Min – Max**	***Mean***	**SD**	**Min – Max**	
Age (year)	36,68	8,1	21 – 51	38,11	9,9	20 – 54	0,124
Duration of Therapy (year)	6,26	3	1 – 11	4,26	2,6	1 – 10	0,125

Based on Tables 1, it was determined that the majority of respondents in the intervention group were male (78.9%), married (68.4%), had a low level of education (52.60%), and were still employed (84.40%). The average duration of HIV medication therapy for respondents in the

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

intervention group was 6 years, ranging from 1 to 11 years (SD=3.04). In the control group, the majority of respondents had an average age between 20 and 54 years (SD=9.93), were male (76.3%), were married (57.9%), and worked (71.1%). In general, the education level of the control group was modest (71,1%). From a range of 1 to 10 years (SD = 2.60), the average duration of HIV medication therapy for respondents was 4 years.

ARV therapy adherence

Analysis of the mean difference between before and after the intervention and the mean difference in changes in the level of adherence between the intervention group and the control group are included in the bivariate analysis of these research data.

Table 2. Analysis of the mean difference between before and after intervention in the intervention group and control group

Group	Therapy Adherence	*n*	*Mean*	SD	SE	*P value*
Intervention	pre	38	78.29	10.07	1.63	0.001
	post	38	90.00	8.07	1.31	
Control	pre	38	70.11	7.65	1.23	0.001
	post	38	79.39	9.99	1.62	

The average percentage of therapy compliance among 38 respondents in the intervention group was 78.58 percent before the intervention increasing to 90.00 percent after the intervention. The average difference between these two measurements was -11.42, with a standard deviation of 3.0. The statistical test produced a p-value of 0.001 (t=-21.16), so it can be concluded that there is a significant difference between the percentage of patients who adhere to their therapy before and after the intervention was given. In the control group, there was also an increase in compliance but not as high as the intervention group

Table 3. Differences in levels of adherence between the intervention group and the control group in HIV patients following ARV therapy

Group	*n*	*Mean Difference*	SD	SE	t	*P value*
Intervention	38	11,42	3,32	0,54	7,45	0,001
control	38	5,37	3,73	0,60		

The mean change in Adherence levels between before and after the intervention was 11.42 (SD=3.32) in the intervention group, while it was 5.37 (SD=3.73) in the control group, as shown in Table 5. The statistical tests showed a p-value of 0.001 (t=7.45), indicating that there is a statistically significant difference between the percentage of therapy adherence in the intervention group and the control group.

Multivariate analysis

The subsequent findings illustrate the outcomes of the ultimate modeling acquired by the utilization of multivariate analysis.

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

Table 4. The relationship between respondent characteristics and the amount of adherence to antiretroviral (ARV) therapy in individuals living with HIV.

Variable	*P value*	Criteria*
Age	0,182 [a]	Yes
Gender	0,756 [b]	No
Married Status	0,448 [b]	No
Education	0,001 [b]	Yes
Work	0,223 [b]	Yes
Duration of Therapy	0,674 [a]	No

**p value* ≤ 0,25

Based on table 4. The educational variable has a significant effect on the level of therapy adherence among respondents. This is demonstrated by the variable's p-value being less than 0.05.

Table 5. The Influence of Age, Education, And Employment On Therapy Adherence In The Intervention And Control Groups Of HIV Patients

Model	Variable	B	SE	β	t	Sig.	R^2	*Adj.* R^2	F
1	(Constant)	8,20	2,09		3,92	0,001	0,337	0,309	12,191
	Age(year)	-0,06	0,04	-0,11	-1,22	0,224			
	education (low/high)	5,22	0,92	0,54	5,63	0,001			
	work (not working/ work)	0,60	1,07	0,05	0,56	0,577			
2	(Constant)	8,61	1,95		4,41	0,001	0,334	0,316	18,302
	Age(year)	-0,06	0,04	-0,17	-1,21	0,227			
	education (low/high)	5,30	0,91	0,58	5,82	0,001			
	work (not working/ work)	-	-	-	-	-			
3	(Constant)	6,34	0,56		11,26	0,001	0,320	0,311	34,895
	Age(year)	-	-	-	-	-			
	education (low/high)	5,38	0,91	0,56	5,90	0,001			
	work (not working/ work)	-	-	-	-	-			

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

Table 5 displays the outcomes of multiple linear regression tests between confounding variables (age, education, and employment) and respondents' level of adherence to HIV therapy. Based on test results, the final model (model 3) determined that 32% of the model's variable variation could explain the percentage change (R2=0.320). The final model indicates that education (=0.56, p=0.001) is a predictor of variations in the level of ARV therapy adherence among respondents.

DISCUSSION

The impact of interventions utilizing SiARV applications on adherence to antiretroviral (ARV) therapy among individuals living with HIV

Social media has emerged as a strong instrument in healthcare, with tremendous potential to enhance adherence to ARV medication among persons living with HIV (PLWHIV). This research tool utilizes the Si ARV Application which is connected to WhatsApp which provides notifications as reminders to take ARV medication. The statistical analysis identified a p-value of 0.001. The statistical analysis showed the impact of interventions utilizing SiARV applications on the adherence to antiretroviral (ARV) medication among individuals living with HIV. Reminders using social media applications can facilitate interaction between patients and health services in increasing compliance with ARV treatment in people with HIV (10). Timely reminders can help patients stay on track with their treatment regimen (11). Monitoring medication adherence using social media applications can identify areas for improvement and provide personalized support (12). The implementation of a social media application-based intervention resulted in a statistically significant improvement in mean adherence scores for ARV treatment. This finding demonstrates a notable rise in the level of adherence to antiretroviral (ARV) medicine after the implementation of the intervention, as compared to the period before the intervention among the respondents. Social media-based interventions have shown a potential benefit in increasing or maintaining ARV adherence in various areas. WhatsApp can be used as a reminder to take medication to increase medication adherence (13). Applications through social media appear to promise patients to take personal control over their own care through mHealth tools while supporting and strengthening patient collaboration with healthcare providers (14). Previous research has shown several factors that influence medication adherence, namely self-motivation, counseling, social support from people around, and guidance from medical personnel (15). Awareness of factors influencing adherence enables program coordinators to develop strategies for providing optimal treatment and support services to people living with HIV (PLHIV) and prevents unnecessary treatment and support-related efforts and expenditures (16). In the control group that was not given SiARV intervention, there was still an increase in compliance, possibly due to awareness and motivation from patients with HIV. This cannot be separated from the role of health workers including providing information about HIV, ARV treatment, and treatment guidelines which can empower patients to make the right decisions (17). This cannot be separated from the role of health workers/facilitators, including providing information about HIV, ARV treatment, and treatment guidelines which can empower patients to make the right decisions (18). However, the increase in the intervention group was higher than in the control group. Using SiARV on a smartphone makes it easier for patients to get reminders to take their medication. SiARV provides individualized support based on specific patient characteristics, adherence, and usage behaviors via smartphone. The field of mobile health research is continuously progressing,

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

displaying encouraging findings that indicate a potential influence on enhancing health outcomes. This is supported by the increasing body of evidence and the widespread availability of mobile technology (19). Mhealth can time messages precisely, from reminders that appear suddenly throughout the day to specific moments in decision-making, thus benefiting treatment compliance (20).

Variables that most influence adherence to ARV medication in HIV patients

The present study examines the relationship between confounding factors, namely age, education, and occupation, and the level of HIV medication Adherence among respondents by the utilization of multiple multivariate linear regression tests. Based on the obtained test results, it was determined that the final model (referred to as model 3) was able to account for 32% of the variability in the variables within the model, hence explaining the percentage change (R2=0.320). The results of the final model indicate that education (β=0.56, p=0.001) significantly predicts variations in respondents' degree of adherence to antiretroviral (ARV) therapy.

The study findings indicated a significant association between lower educational attainment and failure to adhere to therapy, with patients possessing lower levels of education being five times more prone to non-adherence compared to those with higher educational backgrounds. The aforementioned findings were acquired after the implementation of controls for age and employment factors among the respondents. Education is one of the most effective weapons to prevent HIV transmission (21). Education is an effective approach for long-term behavior change among high-risk HIV communities globally(22). Consistent with other studies, the level of Adherence was found to be highest among respondents who had attained a tertiary education level, as indicated by a 100% rate of Adherence (23). The amount of formal education is recognized as a significant determinant of an individual's knowledge acquisition. However, it is important to note that information is not solely derived from formal education, but can also be acquired through familial and societal influences. The greater an individual's level of education, the greater their knowledge base to conform with taking ARVs. Respondents with a higher level of education were twenty times more likely to comply with treatment than those with a lower level of education (24)

Researchers have identified a potential correlation between the limited understanding of HIV/AIDS and a dearth of exposure to pertinent information about the etiology and transmission of HIV/AIDS. This phenomenon leads individuals to exhibit inappropriate actions and behaviors, thereby engaging in activities that carry a potential health hazard, such as engaging in unsafe sexual behavior that can result in the transmission of infectious diseases, including HIV/AIDS.

LIMITATION

The SiARV web application connected to WhatsApp provides medication reminder notifications to patients, but this tool has limitations. Compliance depends on the patient entering the data. So patient honesty is needed for the benefits of this tool.

CONCLUSION

The findings of this study demonstrate a significant impact of social media application-based treatments on the adherence to antiretroviral (ARV) medication among individuals with HIV. The mean ARV medication adherence scores exhibited a statistically significant increase following the implementation of the social media application-based intervention, as compared to the values seen before the intervention was administered to the respondent. SiARV, as an antiretroviral information system, has several important implications for

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

medication adherence in the nursing context, especially in medication adherence, especially the ease of accessing patient medication data from one place, including schedule, dosage, and adherence history.

REFERENCES

1. World Health Organisation (WHO). HIV statistics, globally and by WHO region, 2023. Who [Internet]. 2023;1–8. Available from: https://apps.who.int/iris/handle/10665/360348,
2. Kemenkes RI. Ditjen P2P Laporan Kinerja Semester I Tahun 2023. 2023. 1–134 p.
3. Annur CM. Ada 52 ribu kasus HIV di Indonesia pada 2022, homoseksual paling berisiko. In: Databoks [Internet]. 2023. Available from: https://databoks.katadata.co.id/datapublish/2023/07/04/ada-52-ribu-kasus-hiv-di-indonesia-pada-2022-homoseksual-paling-berisiko
4. Kemenkes RI. Profil Kesehatan Indonesia 2018 Kemenkes RI. Health Statistics. 2019.
5. Bukenya D, Mayanja BN, Nakamanya S, Muhumuza R, Seeley J. What Causes Non-adherence among Some Individuals on Long Term Antiretroviral Therapy? Experiences of Individuals with Poor Viral Suppression in Uganda. AIDS Res Ther [Internet]. 2019;16(1):1–9. Available from: https://doi.org/10.1186/s12981-018-0214-y
6. Kensanovanto A, Perwitasari DA. Tingkat kepatuhan dan keberhasilan terapi pada orang dengan penderita HIV/AIDS. Borobudur Pharm Rev. 2022;2(2):31–5. https://doi.org/10.31603/bphr.v2i2.7042
7. Ortiz-Ospina E. "The rise of social media." Publ online OurWorldInData.org. 2019;
8. Hadiyani W, Nambiar N, Said FBM. Health Promotion Interventions among Adolescents for Smoking Cessation : A Systematic Review. Malaysian J Med Heal Sci. 2022;18:204–10.
9. Kim J, Zhang W, Nyonyitono M, Lourenco L, Nanfuka M, Okoboi S, et al. Feasibility and acceptability of mobile phone short message service as a support for patients receiving antiretroviral therapy in rural Uganda: A cross-sectional study. J Int AIDS Soc. 2015;18(1):1–6.
10. Nadia Salsabila Fauziah, Dewi Purnamawati. the Effectiveness of Reminder Messages in Increasing Compliance With Arv Drug in Hiv/Aids Patients. Muhammadiyah Int Public Heal Med Proceeding. 2022;2(1):224–31.
11. Sánchez SA, Ramay BM, Zook J, De Leon O, Peralta R, Juarez J, et al. Toward improved adherence: A text message intervention in an human immunodeficiency virus pediatric clinic in Guatemala City. Med (United States). 2021;100(10):E24867.
12. Peng Y, Wang H, Fang Q, Xie L, Shu L, Sun W, et al. Effectiveness of mobile applications on medication adherence in adults with chronic diseases: A systematic review and meta-analysis. J Manag Care Spec Pharm. 2020;26(4):550–61.
13. Hadiyani W, Ramdani R. Pesan Digital Terhadap Kepatuhan Minum Obat Pada Penderita Hipertensi Di Puskesmas Arcamanik Kota Bandung. J Keperawatan PPNI Jawa Barat [Internet]. 2023;1(1):1–8. Available from: https://ppnijabar.or.id/ojs/index.php/jkp/article/view/1
14. Backes C, Moyano C, Rimaud C, Bienvenu C, Schneider MP. Digital Medication Adherence Support: Could Healthcare Providers Recommend Mobile Health Apps? Front Med Technol. 2020;2(February):1–11.
15. Isabirye R, Opii DJ, Ekit SO, Kawomera A, Lokiru L, Isoke R, et al. Factors Influencing ART Adherence

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

Among Persons Living with HIV Enrolled in Community Client-Led Art Delivery Groups in Lira District, Uganda: A Qualitative Study. HIV/AIDS - Res Palliat Care. 2023;15(June):339–47.

16. Paramesha AE, Chacko LK. Predictors of Adherence to Antiretroviral Therapy among PLHIV. Indian J Public Health. 2019;63(4):367–76.
17. Okoli C, Brough G, Allan B, Castellanos E, Young B, Eremin A, et al. Shared Decision Making Between Patients and Healthcare Providers and its Association with Favorable Health Outcomes Among People Living with HIV. AIDS Behav [Internet]. 2021;25(5):1384–95. Available from: https://doi.org/10.1007/s10461-020-02973-4
18. Hutahaean BSH, Stutterheim SE, Jonas KJ. Barriers and Facilitators to HIV Treatment Adherence in Indonesia: Perspectives of People Living with HIV and HIV Service Providers. Trop Med Infect Dis. 2023;8(3).
19. Badawy SM, Kuhns LM. Texting and mobile phone app interventions for improving adherence to preventive behavior in adolescents: A systematic review. JMIR mHealth uHealth. 2017;5(4):1–17.
20. Kuwabara A, Su S, Krauss J. Utilizing Digital Health Technologies for Patient Education in Lifestyle Medicine. Am J Lifestyle Med. 2020;14(2):137–42.
21. Khuzwayo N, Taylor M, Connolly C. Changing youth behaviour in South Africa. Heal SA Gesondheid. 2020;25:1–7.
22. He J, Wang Y, Du Z, Liao J, He N, Hao Y. Peer education for HIV prevention among high-risk groups: A systematic review and meta-analysis. BMC Infect Dis. 2020;20(1).
23. Sari F, Raveinal, Apriyanti E. Pengaruh Edukasi Berdasarkan Teori Efikasi Diri Terhadap Kepatuhan Pembatasan Cairan dan Interdialytic Weight Gain (IDWG) Pada Pasien Hemodialisis. J Penelit Kesehat Suara Forikes [Internet]. 2020;11(9):67–70. Available from: http://forikes-ejournal.com/index.php/SF/article/view/sf11nk411
24. Indri E, Utami R, Suryoputro A, Widjanarko B, Magister M, Kesehatan P, et al. Faktor-Faktor Yang Memperngaruhi Kepatuhan ARV Pada Remaja Positif HIV Di Kota Semarang. 2018;1–13.