TELEMEDICINE (MOBILE PHONE TECHNOLOGIES) INTERVENTIONS TO SUPPORT PERCEPTIONS AND MEDICATION ADHERENCE AMONG HIV-POSITIVE

Dewi Erna Marisa [1], Nenden Lesmana Wati [2], Yeyen Desiar Firda Sary [3], Fenita Purnama Sari Indah [4]*, Nada Afra [5] and Andiyan Andiyan [6]

[1] Nursing, Health Faculty Institut Teknologi Dan Kesehatan Mahardika, Cirebon City, West Java, Indonesia.
[2] Nursing Study Program, Faculty of Health, Universitas Faletehan, Bandung, West Java, Indonesia.
[3] Nursing Study Program, Faculty of Nursing and Midwifery, Institut Ilmu Kesehatan STRADA Indonesia, East Java, Indonesia.
[4] STIKes Widya Dharma Husada Tangerang, South Tangerang, Banten, Indonesia.
*Corresponding Author Email: fenita.purnama@masda.ac.id
[5] Yayasan Penerbit Muhammad Zaini, Aceh, Indonesia.
[6] Department of Architecture, Faculty of Science and Engineering, Universitas Faletehan, Bandung, West Java, Indonesia.

Abstract

The objective was to develop and validate the use of Telemedicine to increase perception and medication adherence in PLWHA. The research design was pre-experimental with a one-group pretest-posttest design. Before data collection, a Telemedicine application was developed by the researcher. The intervention was for two months, with a pretest and a posttest conducted after it. The sample was 117 HIV/AIDS patients in Banten Province. The results indicated significant differences in perceived threat, perceived susceptibility, and medication adherence between pre-test and post-test. Telemedicine (Mobile phone technologies) was found to be effective in increasing perception and medication adherence in PLWHA.

Keywords: HIV/AIDS; Medication Adherence; Mobile Phone Technologies; Perceptions; PLWHA; Telemedicine.

1. INTRODUCTION

Based on estimates by the World Health Organization (WHO), the number of HIV (Human Immunodeficiency Virus) cases worldwide was nearly 1.5 million in 2020. The Southeast Asia and Eastern Mediterranean regions reported 100 thousand and 41 thousand new HIV cases, respectively. In terms of gender, the number of men living with HIV is higher than women, with 660 thousand men and 640 thousand women recorded in 2020. The total number of HIV cases in the age group of 15 years and over amounted to 1.3 million cases.[1]

HIV/AIDS cases have been increasing every year.[2-3] According to data from the Banten Health Office, the number of HIV/AIDS cases in Banten was 16,403 people in 2016. However, until July 2019, there were 7,337 new findings of HIV/AIDS cases and 403 cases of death due to HIV/AIDS. The Tangerang City Health Office revealed that the number of HIV/AIDS cases in Tangerang City has fluctuated over the past four years.[4] In September 2020, there were 154 people with HIV/AIDS, compared to 232 people in 2019, 157 people in 2018, and 124 people in 2017. The Health Office has been providing screening services to tackle HIV/AIDS cases in all Hospitals (RS) and Community Health Centers spread across Tangerang City in 2021.

By effectively taking ARVs, a person living with HIV/AIDS can reduce the risk of transmitting the virus to uninfected sexual partners by up to 96%. The World Health Organization (WHO) recommends that individuals living with HIV maintain consistent

consumption of ARVs to extend their life expectancy and reduce the transmission of HIV/AIDS. Without continuous ARV treatment, HIV infection can progress to AIDS within 2-15 years, varying depending on the infected individual, and may lead to a faster progression to death.[5-6]

The Health Belief Model (HBM) theory explains that perceptions can be subjectively influenced based on an individual's point of view. The perceptions in the HBM theory, in the case of HIV and AIDS, include perceptions of vulnerability to contracting HIV and AIDS, perceptions of the seriousness of HIV and AIDS, which can lead to exclusion, loss, and even death, perceptions of the benefits or positive outcomes, and negative perceptions of the impact of HIV and AIDS, as well as perceptions of one's ability and confidence in carrying out preventive behavior.[7-8]

Based on this background, there is a need for breakthroughs to strengthen and improve perception and adherence to ARV medication among PLHIV. Comprehensive and continuous interventions regarding Adherence to Medication should be provided to PLHIV. Therefore, media is essential to increase perception and adherence to ARV medication. This research aims to develop and validate a Health Information System for Adherence to Medication. To conduct this research, a feasibility study assessment is necessary. Objectively and rationally, this research is highly feasible to carry out, considering its strengths, weaknesses, and potential to address issues related to Adherence to Medication. By utilizing technology, the education provided can be effective and efficient, as nearly all PLWHA use mobile phones to access Telemedicine services. Implementing technology will also save costs while generating significant benefits in problem-solving.

2. METHODS

The study used a quantitative approach and followed a pre-experimental design with a one-group pretest-posttest technique. A pretest (initial observation) was conducted before administering the intervention, and then a posttest (final observation) was carried out. Measurements were taken before (pretest) and after the intervention (posttest) to determine changes in perceived threat, perceived vulnerability, perceived seriousness, perceived benefits, and adherence to ARV medication. The research subjects in the group were randomly selected, resulting in a sample of 117 PLWHA from Banten Province.

The sample criteria for this study included specific inclusion and exclusion criteria that determined whether the sample could be used. These criteria were considered during the selection process. The research inclusion criteria were as follows: active members of the Tangerang Regency General Hospital (RSU), aged > 17 years, able to read, able to access telemedicine (after socialization), willing to be a respondent, and had access to telemedicine. Ethical approval for this research was obtained with letter number No. 235/KEPK/FKM-UNEJ/VIII/2022. Based on Fig 1 is Telemedicine (Mobile Phone Technologies) Interventions to Support Perceptions and Medication Adherence Among HIV-Positive.
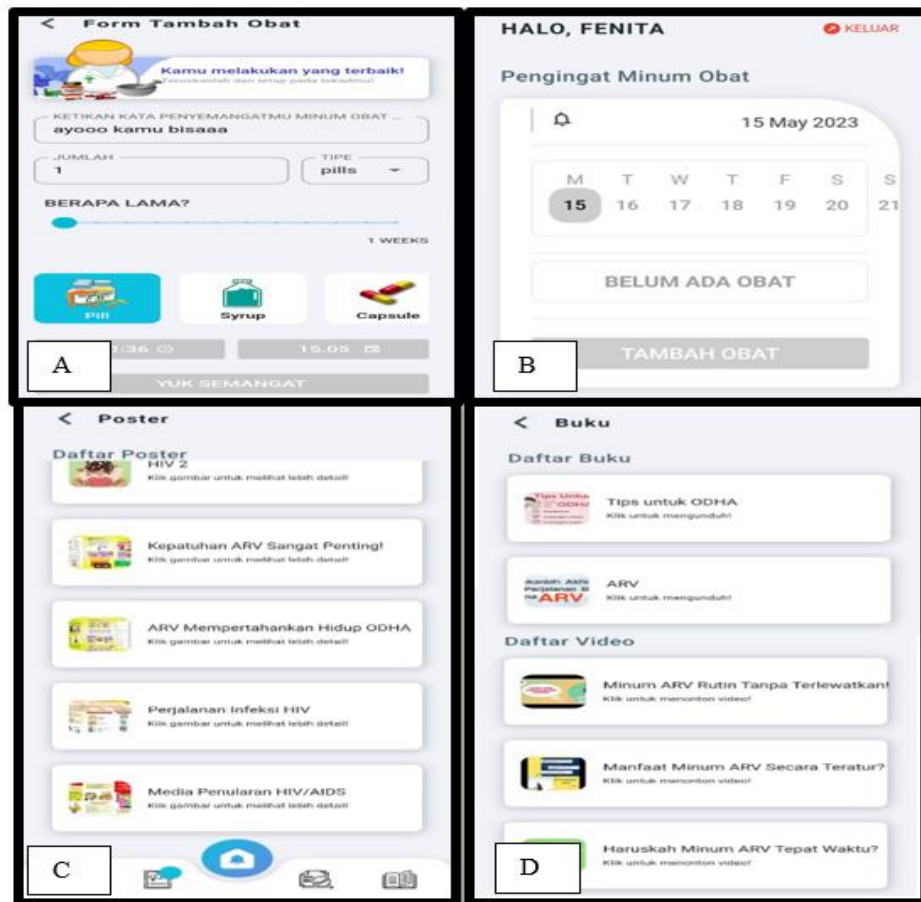
Figure 1: Telemedicine (Mobile Phone Technologies) Interventions to Support Perceptions and Medication Adherence among HIV-Positive

3. RESULTS

Table 1: Results of Analysis of Respondent Characteristics

Variable	n	%
Gender		
Man	101	86.3
Woman	16	13,7
Education		
No Education	4	3,4
Elementary School/Equivalent	16	13,7
Middle School/Equivalent	70	59,8
High School/Equivalent	26	22,2
College	1	0.9
Work		
Unemployed	18	15,4
Employed	99	84.6
Income		
<Regional Minimum Wage	36	30,8
>Regional Minimum Wage	81	69,2
Duration of HIV/AIDS infection		
≤ 6 Months	10	8,5
> 6 Months	107	91.5

Source: Primary Data, 2023

Based on Table 1, it can be observed that the latest educational demographics indicate that the majority of PLWHA are men (86.3%), and the highest educational attainment is junior high school or equivalent, with 70 respondents (59.8%). Regarding occupation, 99 PLHIV (84.6%) were employed. Moreover, 81 individuals living with HIV (69.2%) had an income >UMR (minimum wage), and 107 people living with HIV had been infected for > 6 months (91.5%).

Table 2: Effectiveness of Health Information Systems in Adherence Medication (n=117)

Variable		n	Mean ± SD	Min-Max	p-values
Perception Threat	Pre Test	117	15.20-3.04	9-20	0.000
	Post Test	117	17.36-2.32	12-20	
Perception Vulnerability	Pre Test	117	16.37-2.61	12-21	0.000
	Post Test	117	17.85-2.02	14-21	
Perception Seriousness	Pre Test	117	12.86-1.93	8-17	0.075
	Post Test	117	13.05-1.92	9-17	
Adherence Medication ARV	Pre Test	117	20.76-2.99	11-24	0.000
	Post Test	117	21,23-3,20	11-26	

Source: Primary Data, 2023

4. DISCUSSION

Compliance with taking antiretroviral drugs (ARV) in patients with HIV/AIDS is a crucial effort to prolong their lives, but it requires a high level of adherence to achieve therapeutic success and prevent resistance. To achieve a response that suppresses the amount of the virus by 85%, a drug adherence rate of 90-95% is required, necessitating patients to make a conscious decision about taking the medication. Considering that there is currently no cure for HIV/AIDS, the consumption of ARV drugs plays a vital role in controlling the viral load, as these medications must be taken throughout the patient's life with HIV/AIDS.[9-11]

Compliance with ARV medication can be categorized as <95% (non-adherent) or >95% (adherent) based on the consumption of ARVs in PLHIV. According to the results of the Wilcoxon Signed Rank Test, the telemedicine intervention effectively increased adherence to ARV medication in PLWHA (people with HIV/AIDS), with a p-value of 0.000, indicating a significant difference in the perception of threat between the pre-test and post-test. In terms of Adherence Medication, the average pre-test value was 20.76, and after the post-test, it increased to an average value of 21.23.

Table 2 illustrates the effectiveness score of telemedicine in increasing Adherence to Medication. For threat perception, the average pre-test value was 15.20, and after the post-test, there was an increase to an average value of 17.36. Threat perception refers to the perception of opportunities that may cause harm and is interpreted as a person's belief in the likelihood of the impact of a disease event.[12-13]

Regarding perceived vulnerability, the average score was 16.37, and after the post-test, there was an increase to an average value of 17.85. The Wilcoxon Signed Rank Test also showed the effectiveness of telemedicine in increasing perceptions of vulnerability in PLWHA (people with HIV/AIDS) with a p-value of 0.000, indicating a significant difference in perceptions of vulnerability between the pre-test and post-test. Vulnerability represents the potential impact a person may experience due to certain conditions, and in this context, it refers to one's belief in the possible impact of a disease.[14-15]

For the perception of seriousness, the average pre-test value was 12.86, and after the post-test, there was a slight increase to an average value of 13.05. The Wilcoxon Signed Rank Test results showed that the health information systems' effectiveness in preventing opportunistic infections increases the perception of seriousness in PLHIV (people with HIV/AIDS) with a p-value of 0.075, indicating no significant difference in the perception of seriousness between the pre-test and post-test. Perceived seriousness involves a person's perception of the risk and impact of contracting a disease, its treatment, and the social implications it brings.[8,16] The high perception of seriousness is likely due to the opinions of PLHIV about the gravity of HIV and AIDS.[17-18]

5. CONCLUSION

The results of the study demonstrated significant differences in perceived threat (p-value = 0.000), perceived susceptibility (p-value = 0.0000), and adherence to ARV consumption (p-value = 0.000) between the pre-test and post-test, with an alpha (α) value of 0.05. However, there was no significant difference in perceived seriousness (p-value = 0.075) with an alpha (α) value > 0.05. Therefore, it can be concluded that telemedicine (Mobile phone technologies) is effective in increasing perception and adherence to ARV consumption in PLHIV.

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