

# **Telehealth As An Alternative Method For Improving Anti-Retroviral Treatment Compliance In Adolescent And Young Adults With Hiv: A Scoping Review**

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## **Abstract**

Compliance of patients with human immunodeficiency virus (HIV) in undergoing therapy is essential in reducing the viral load. Currently, the world is in the era of revolution 4.0, where there is a combination between technology and human needs. The effort to adapt to this condition is by utilizing Telehealth. Telehealth is considered efficient in controlling, monitoring, and providing palliative care remotely. This study's purpose is to review Telehealth's effectiveness as an alternative method of increasing anti-retroviral treatment compliance in children, adolescents, and young adults with HIV. Using scoping review method with inclusion criteria for articles published in 2012 – 2022, Randomized Control Trial and Experimental Study research design, and published in English. Selection of articles using PRISMA Flow Diagram. The database consists of PubMed and EBSCO using keywords telenursing, compliance, anti-retroviral agents, and children. Four articles were included in the study out of 895 identified articles. The use of Telehealth provides the potential for both children and youth to increase patient motivation and adherence to treatment. Telehealth in patients with HIV used short messages. So, Telehealth has the potential to become an alternative method of increasing anti-retroviral treatment adherence in children, adolescents, and young adults with HIV.

**Keywords:** adherence, anti-retroviral, children, telehealth, youth living.

## Introduction

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) have now become a global health emergency. HIV is a virus that infects cells of the immune system, namely white blood cells, causing damage or decreased function of the human immune system, while AIDS is a collection of symptoms of disease caused by a decreased immune system due to infection with the HIV virus (Indonesia Ministry of Health, 2016). According to data from UNAIDS/United Nations Program on HIV and AIDS (2020) there are 37.7 million people in the world living with HIV/AIDS. As many as 1.8 million sufferers, namely children and adolescents aged 10-19 years (UNICEF, 2020).

The main management for people with HIV/AIDS is to provide treatment therapy called ARV/ART (Anti-Retroviral Therapy). ARV drugs cannot cure HIV/AIDS, but they can help people living with HIV/AIDS (PLWHA) live longer and healthier lives so that they will improve their quality of life (Penazzato et al., 2018). ARV treatment can also reduce the risk of HIV transmission and prevent the worsening of opportunistic infections. HIV-positive adolescents and young adults often experience sub-optimal medication adherence (Garofalo et al., 2016). Several studies have found that HIV-positive adolescents experience stigma and discrimination from family and friends making it possible to engage in non-compliance for fear of their HIV-positive status being exposed (Rana et al., 2015). Therefore, appropriate home health technology can be important in helping patients to develop self-management skills in medication adherence necessary to live with their disease.

The world is in the era of revolution 4.0, combining technology and physical human limitations. So, the effort to adapt to these conditions is to use Telehealth. Telehealth is

considered efficient in remotely controlling, monitoring and providing palliative care (Bonsignore et al., 2018). Telehealth is an information and communication technology to monitor and send messages related to health status. Telehealth makes it easier for patients to make the examination process more efficient. This technology allows the nurse to remotely monitor and assess the patient at home with external devices and a telehealth system of reported signs and symptoms to initiate appropriate action. In this regard, this review aims to explore and provide an overview of the potential of telehealth as an alternative method of increasing anti-retroviral treatment adherence in children, adolescents, and young adults with HIV.

## Research Methods

The design in this literature was a scoping review followed PRISMA Flow Diagram. This study used two databases to search for relevant studies, namely PubMed and EBSCOhost. The researcher searched on May 16, 2022, using keywords that matched the MeSH browser “telenursing”[MeSH Terms] OR (“telehealth”[MeSH Terms] OR (“e-health”[MeSH Terms] AND (“compliance”[MeSH Terms] OR (“adherence, directive”[MeSH Terms]) AND (“anti-HIV drugs”[MeSH Terms]) OR (“anti-retroviral agents”[MeSH Terms]) OR (“anti-HIV agents”[MeSH Terms]) AND (“children”[MeSH Terms]) OR (“adolescent”[MeSH Terms])). This study followed the PICO framework to create an eligibility criterion: population: children, adolescents, and young adults HIV patient, intervention: telehealth, comparison: not applicable, outcome: adherence to anti-retroviral. The studies reviewed are full-text articles published from 2012 – 2022, using a Randomized Control Trial or Study Experimental research design, and published in English.

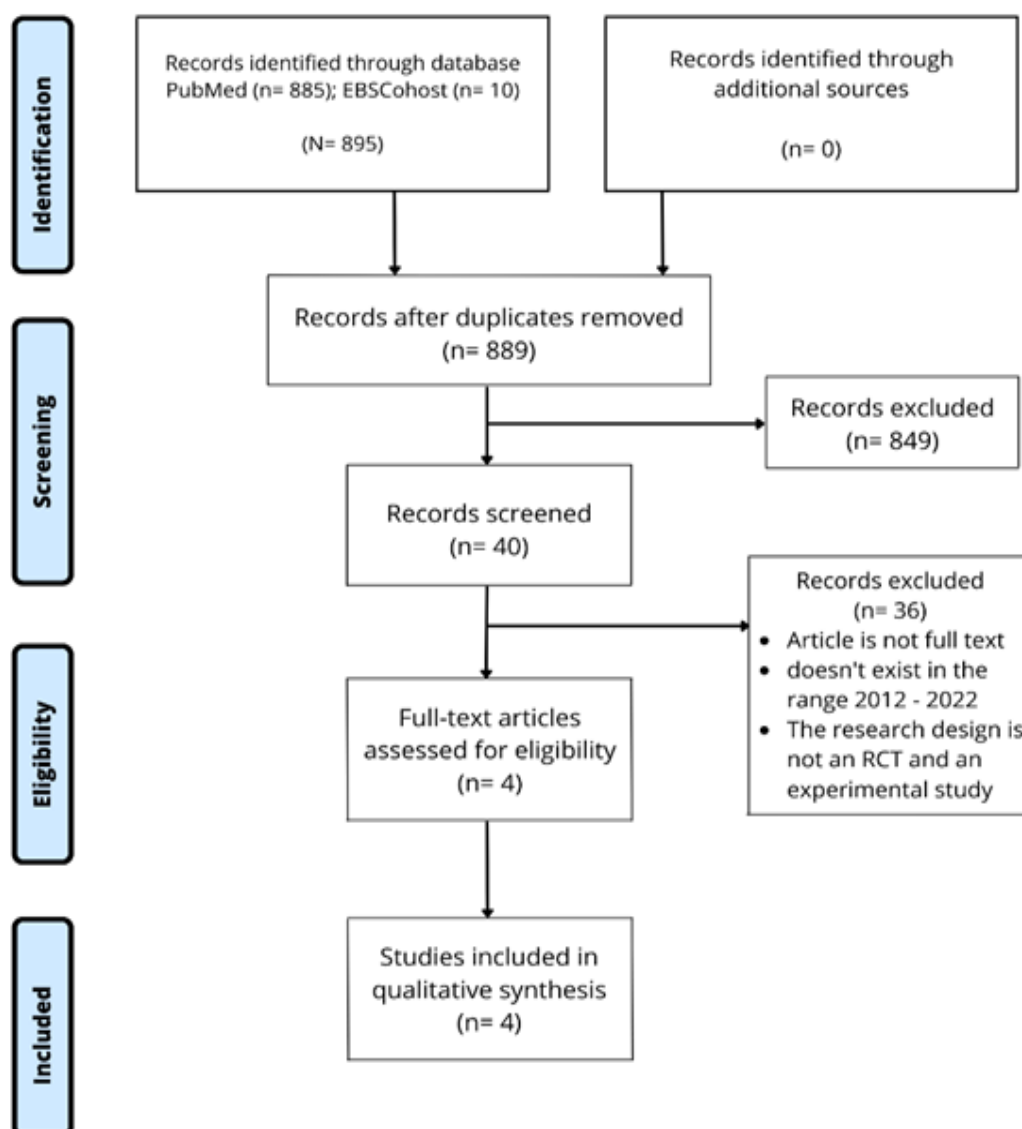


Diagram 1

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## Results

Author	Sample	Location	Design	Intervention	Instrument	Result
Abiodun et. al. (2021)	209 adolescent (15-19 years)	Nigeria	RCT	Short message via cell phone regarding medication adherence	AIDS Clinical Trials Group (ACTG) adherence questionnaire and VAS assessment	There was a statistically significant difference between the control and intervention groups regarding the viral load parameter. The difference in mean viral load between the two groups was 30,998.42 (95% CI 903.35–61,093.48) with a p-value of -0.044.
Sanchez et. al (2021)	143 respondents (6-24 years)	Guatemala	RCT	Short message via cell phone regarding medication adherence	4-day Recall Questionnaire	The intervention group (n=50) experienced a small but significant mean improvement in adherence over a six-month period (4%, $P<.01$ ) while the control group (n=50) was not significant (mean improvement: 0.8 %, $P= .64$ ).
Garofalo et. al. (2016)	105 adolescent and young adults (16-29 years)	United States of America	RCT	Short message for 6 months	Visual analog scale	Adherence to the intervention group increased from 28% at baseline to 64% at 3 months and decreased slightly to 61% at 6 months follow - up ; whereas in the control group it was 24% at baseline and 43% and 51% at 3-month and 6-month follow-up.

McCarthy et. al. (2020)	155 respondents (15-24 years)	Uganda	RCT	Short message for 9 months	Wisepill	There were 88% who showed improvement in the intervention group and said that their quality of life improved with the motivation and resulted in a new focus on their health.
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## Discussion

Based on the results of a review conducted, it was found that telehealth can be an alternative method for people with HIV in children, adolescents, and adults to better comply with anti-retroviral treatment. This review showed positive results in medication adherence after the intervention. However, telehealth for children and adolescents is different from adults. Unique methods are needed in conducting this intervention because children will be more easily distracted. Hence, an interactive way is necessary so that children do not feel intimidated when doing telehealth (American Psychological Association, 2020). The research reviewed uses more formal methods, so modifications are needed. As was done (Sánchez et al., 2021), messages for patients aged 6-12 years will be sent through their caregivers or parents, while patients aged 12 years and over will receive short notifications directly. The intervention in this study was given by sending short messages for six months to a total of 53 respondents. The short messages sent consisted of 3 categories: reminders to take medication consistently, reminders to take medication at the same time every day, and instructions on how to take medication. Although in this study, adherence increased in the intervention group, only the results were more significant in the age range above 12 years because they could play a more active role than younger children; besides that, they also used the internet the same frequency as adults aged 25 years and over.

The use of telehealth in increasing adherence to anti-retroviral treatment can also be carried out among adolescents with an age range of 15-24 years (MacCarthy et al., 2020). In his article, the study was conducted on 155 HIV-positive adolescents

in Uganda. Respondents were divided into 2 large groups consisting of a control group of 59 people who received treatment as usual from The AIDS Support Organization (TASO) at Mulago clinic in Kampala, the capital of Uganda, while the intervention group who received intervention through Wisepill was divided into 2 small groups. each of which amounted to 40 people for the T1 group who were given an intervention in the form of weekly short messages to notify their compliance the previous week as feedback and avoid the observed bias on each individual's compliance, and also the T2 group of 56 people who were given the intervention in the form of short messages contain information about the compliance level of themselves and their peers. From this study, it was found that providing information in the form of self-adherence as was done in the T1 group, did not increase adherence to anti-retroviral treatment, while providing information related to compliance with colleagues had more potential to increase adherence to anti-retroviral treatment in adolescents, such as intervention given to group T2. While overall the use of telehealth in anti-retroviral treatment in adolescents can be done to improve compliance, quality of life, and motivation by giving a new focus on their health.

Another study conducted by Garofalo et al. (2016), t telehealth can also be given to improve compliance in adults and young adults aged 16-29 years. The intervention given in this study was in the form of a short message sent within 6 months using a visual analog scale instrument. A short message is sent asking if the participant has taken their medication and then it is designed by the participant themselves and personalized depending on their circumstances. The results showed that the use of short messages

as reminders could increase anti-retroviral treatment adherence by as much as 33%. Telehealth is also feasible and effective to increase treatment success as evidenced by the amount of viral load that can be suppressed from the results of treatment monitoring (Abiodun et al., 2021).

Telehealth can also be said to be efficient because it is more efficient than usual care costs, this is in accordance with research conducted by Grustam et al. (2018) that remote support provided by nurses by telephone is more cost-effective than ordinary care and is followed by an increase in communication between patients and health workers. Telehealth affects not only patients but also service providers by increasing access to care such as using fewer resources and reducing visit times (Saber et al., 2016). Based on research by Mulawa et al., (2018) it is stated that children, adolescents, and other young people receive more negative stigma and discrimination from the surrounding environment for their positive HIV status which will affect their non-adherence in treatment, so they need social support and motivation. the greater one. With this telehealth intervention, it is very useful for clients to reduce social isolation, namely by fostering good relationships with other people by involving other participants who are older because they are considered to have spent more time with family and friends.

In addition, telehealth is very suitable to be applied to developing countries where health resources and health service centers are still few. As happened in Sub-Saharan Africa where the number of health workers is very small so that telehealth is used to improve health services. However, along the way, there are still obstacles faced by telehealth technology in developing countries such as the lack of good communication infrastructure which greatly hampers this technology (Combi et al., 2016). The integration of services using telehealth can also support the continuity of care for chronic diseases (Holyk et al., 2017). This can be seen in the management of chronic diseases suffered by patients for the better. Thus, telehealth can improve the well-being of people with disease by making their disease conditions more controlled.

## Conclusions

Telehealth has proven an alternative method for HIV-positive children, adolescents, and young adults in increasing adherence to anti-retroviral therapy. The analysis of the four articles showed that telehealth via short messages could improve adherence to anti-retroviral therapy in patients, as evidenced by a decreased viral load, relatively cost-effective, and easier access for patients with health workers. However, there needs to be a collaboration between multidisciplinary professions so that services are more optimal. In addition, health workers must also review and develop protocols to assist patients and their families in meeting their health needs and ensure the confidentiality of patient data.

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