



Original Research

## Care, Support and Therapy Service of HIV Patients with the “SATE Krembung” Application

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### ABSTRACT

**Introduction:** The prevalence and incidence of HIV and AIDS in Sidoarjo is still high. Today, the adherence of patients to several ART services in Sidoarjo is quite low and varied. Therefore the researchers want to find out the effectiveness of registration using “the SATE Krembung” application in terms of service effectiveness, reducing the Lost Follow Up (LFU) and increasing patient adherence in Krembung Primary Health Care.

**Methods:** The study was cross-sectional. The use of alternative ART service modes was done via “the SATE Krembung” application as an integrated queue system. The patients who participated in this study were HIV patients at Krembung Primary Health Care who accessed ART at Krembung Primary Health Care within the age range of 20 - 60 years. The total number of samples in this test was 16 patients.

**Results:** Registration using “the SATE Krembung” application can reduce the waiting time for getting access to services for the HIV patients who plan on getting CST services and ART collection.

**Conclusion:** Service effectiveness due to the use of “the SATE Krembung” application can improve service quality, reduce the Lost Follow Up (LFU) and increase the patient adherence in Krembung Primary Health Care’s ART services.

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### INTRODUCTION

Human immunodeficiency syndrome (HIV) infection is an important public health problem in the worldwide population, especially in East Java Province which reached 8,204 patients in 2017. This is an iceberg phenomenon that can still increase along with the availability of the Poly Voluntary Consulting Test (VCT) at each Primary Health Service in the East Java province. (Kementerian Kesehatan Republik Indonesia, 2018).

There are several problems concerning the HIV cases in East Java, in that the patients are not always from the key groups, that pregnant women are tested for HIV and that not all health services can carry out HIV testing and care, support and treatment (CST). Not all HIV patients are willing to undergo therapy in

the health services, adherence to ART is still low, there are still HIV patients who have dropped out of treatment and not all cross-sectors of society are involved in handling HIV. (Dinas Kesehatan Kabupaten Sidoarjo, 2018).

The cases of HIV and AIDS in Sidoarjo Regency up until July 2018 was estimated to total 5226 people; HIV patients totaled 2797 people (53%) and the patients who had AIDS conditions totaled 1432 people. Of the 1432 patients with AIDS, the number of deaths from AIDS was recorded at 441 people (50%), the number of children with AIDS was 34 (3.5%) and the number of housewives with AIDS was 68 (6.6%). (Dinas Kesehatan Kabupaten Sidoarjo, 2018; Kementerian Kesehatan Republik Indonesia, 2018).

Since 2018, the district health office of Sidoarjo has made a breakthrough in HIV-AIDS prevention in

the community. The transmission of HIV is not only through sexual contact, but it can also be through blood, syringes and breast milk. Individuals who are infected play an important role in the spread of the disease, so contact with patients of HIV is one that needs attention. (Widyaningsih, Zahra, Kurniawan, Sutanto, & Saputro, 2019) HIV treatment begins with the establishment of a health center that opened specifically for the care, support and treatment services of patients with HIV. The service was started by three major health centers in the Sidoarjo Regency, namely Waru Primary Health Care, Krian Primary Health Care and Porong Primary Health Care. The increasing number of patients in Krembung Primary Health Care center has made the services more crowded so the number of complaints regarding the speed of service being long has increased. Queues and crowds are not uncommon. (Dinas Kesehatan Kabupaten Sidoarjo, 2018).

Efforts should also be made to investigate and compare the content development with that of other mobile modalities, such as smartphone applications. Research on the prevalence of smartphone ownership required for a feasible SMS intervention is also necessary. This could not only lead to improved collaborations and content but it could also facilitate learning and applications beyond HIV/AIDS. (Kerrigan, Kaonga, Tang, Jordan, & Hong, 2019).

Krembung Health Center has an online queue system called "SATE Krembung" which can provide a service time. One of its doctors won an exemplary doctor award in 2018 and the Primary Health Care provides ART services for patients with HIV. (Jawa Pos, 2018; Puskesmas Krembung, 2018).

Based on the explanation above, the researchers in this study tried to find an alternative queuing model to increase the adherence to taking medication within the HIV patients in Krembung Primary Health Care with the use of the application "SATE Krembung". With this research, it is expected that there will be a new queuing model to increase the adherence to taking ART drugs, to reduce the queue numbers and finally to be able to increase the Lost Follow Up rate and the quality of health services in the Sidoarjo district overall.

## **MATERIALS AND METHODS**

This research was conducted by making an online application that we named "SATE Krembung". The present study involved both male and female patients at the Poly VCT Krembung Primary Health Care in Sidoarjo Regency who had been tested for HIV using three methods and who had been declared HIV reactive within the age range of 20 - 60 years old between July - December 2018. The patients were divided into 11 men and 5 women.

The patients will begin the registration treatment manually by taking a queue number at the counter along with the general patients and the elderly without special treatment. The clerk will calculate the

time by recording the time taken from the patient taking the queue number at the counter up until the patient gets the medicine and goes home. At the next visit, the patient will be given education and information about "the SATE Krembung" application and taught to download and operate it online. The patients, on the second visit, will be asked to register online at the time specified by the officer for taking drugs online with "the SATE Krembung" application. The registration is done during the visit.

When the patient arrives for the third visit, a time calculation will be made as done in the manual registration above. Then the data obtained is recorded and the data processing and analysis is performed using SPSS version 21.

The ART services at Krembung Primary Health Care are initially carried out just like those of the general patients who have just arrived for treatment and who are not familiar with "the SATE Krembung" application. We recorded the time of service from when the patients queued up until they obtained the medical record collection services, including the waiting time for the doctor services until they were served by the doctors, the prescribing services from the time that the patients handed over the prescription to being given the drugs and the drug information itself. All service times were calculated one by one and then cumulatively. After that, the data in our patient's medical record was analyzed.

The ART therapy for the patients receiving queue treatment with "SATE Krembung" was in the form of a Fixed Dose Combination (FDC) with a single dose taken at night. The FDC composition was Tenofovir 300 mg, Lamivudin 300 mg and Efavirenz 600 mg. (Peraturan Menteri Kesehatan Republik Indonesia Nomor 84 Tahun 2014 Tentang Pedoman pengobatan antiretroviral, 2014)

The material needed by this research was "the SATE Krembung" application that was available on Google Play Store. How to get and operate the application is listed below:

- 1) The patient is directed to download "the SATE Krembung" application on the Google Play Store and to install it on their Android Smartphone. In the privacy policy option, the patient is asked to give their agreement and then the patient logs in to the application.
- 2) An explanation of how to use the schedule message feature and others on the application is given.
- 3) The patients are asked to register on their visit with the application according to the schedule for taking ARV control. Then they need to save the queue receipt in the patient gallery which can be done automatically through the application.
- 4) Patients come directly to the doctor's room without going in line according to the hours that the queue is served shown on the receipt.
- 5) Patients enter the examination room and get seen to by the doctor.
- 6) Patients submit their prescriptions to the Krembung Primary Health Service pharmacy, get

their medication and provide information about the drug.

- 7) Each patient moves to where the officer records the time as needed
- 8) Data is collected, analyzed and compared to the manual queuing services without the application use.

**RESULTS**

The CST services provided to the HIV / AIDS patients are services that may still be very taboo and that can cause stigma. Our patients are very keen to maintain the confidentiality of their status so then the service must be carried out as confidential as possible. At present, there are 16 HIV patients in Krembung Primary Health Service consisting of 11 Men and 5 Women.

**Characteristics of the Patients**

The patients who contributed to this research are distinguished by sex; there are 11 men (69%) and 5 (31%) women as can be seen in figure 1.

Based on Figure 1, there were 11 (69%) men and 5 (31%) women who were registered as patients with HIV at Krembung Primary Health Care in 2018. They were declared HIV reactive and were aged between 20 - 60 years old. They were patients between July - December 2018.

**Poly VCT Service With Manual Registration**

The duration of time regarding the Poly VCT service through manual registration at Krembung Primary Health Care as can be seen in the figure 2.

From the observations of the 16 patients with HIV who received the services without using “the SATE Krembung” application, the average queue time obtained up until the patient's medical record was delivered to the doctor's office was 28 minutes. The waiting time to be called up to obtain the services of the doctor was 19 minutes, the waiting time from the first time hanging the script over to get the medicine and to get an explanation of the drug information amounted to 22 minutes and the obtained total time during the poly VCT service at Krembung Primary Health Care without using “the Krembung SATE” application was 69 minutes

**Poly VCT Service with the “SATE Krembung” Application**

The duration of time taken using the Poly VCT service with “the SATE Krembung” application at Krembung Primary Health Care can be seen in the figure 3.

From the observation of 16 patients with HIV who received services via “the SATE Krembung” application, the average queue time was obtained up until the patient's medical record was delivered to the doctor's room at 0 minutes. This was since the patient first arrived because the medical record was prepared a day before the patient arrived.

The waiting time before being called up to getting the service by the doctor was 8 minutes. This is because with “the SATE Krembung” application, the

patient can come up with an estimated period of time that has been printed on the application token.

The waiting time from the first time putting the prescription in to getting the medicine and the explanation about the drug information is equal to 5 minutes. This is because the routine ARV drug preparation has been done one day before and the drug officer only needs to add additional prescriptions if the doctor provides additional therapy.

The total time taken to obtain the poly ARV services at Krembung Health Center using “the Krembung SATE application” was 13 minutes.

**Difference in the Time of the Poly VCT Service Between Manual Registration and Registration with the “SATE Krembung” Application.**

The differences in the duration of time through the Poly VCT service between manual registration and “the SATE Krembung” application at Krembung Primary Health Care can be seen in the figure 4.

According to Figure 4, it was found that the mean value of providing the medical records was 28 minutes by manual registration and 0 minutes by “the SATE Krembung” application. The doctor's service was 19 minutes by manual registration and 8 minutes by “the SATE Krembung” application. The receipt service was 22 minutes by manual registration and 0 minutes by “the SATE Krembung” application. The total time was 69 minutes by manual registration and 13 minutes by “the SATE Krembung” application.

Table 1. Results of the Analyzed Independent T Test Between Manual Registration and “the SATE Krembung” Application at Krembung Primary Health Care in 2018.

Variable	F	Sig (p) Value
Medical Record Service	22.033	.000
Time Doctor Service	6.082	.020
Receipt Time	39.201	.000
Total Time	23.217	.000

Based on the statistical analysis using the IBM SPSS statistical version 21 application with an independent sample t test, we obtained the significance (p) value and an F value of 22,033 which means that there were differences in the time service:

- 1) MR preparation (p) value of (0,0001) < α (0,05) between manual registration and registering using “the SATE Krembung” application
- 2) Doctor service (p) value of (0,02) < α (0,05) between manual registration and registering using “the SATE Krembung” application
- 3) Receipt (p) value of (0,0001) < α (0,05) between manual registration and registering using “the SATE Krembung” application
- 4) Total time (p) value of (0,0001) < α (0,05) between manual registration and registering using “the SATE Krembung” application.

Based on the statistical analysis, there are differences in both of the services which could reduce the queue when providing medical records to the HIV

Patients With HIV at Krembung Primary Health Care Year 2018

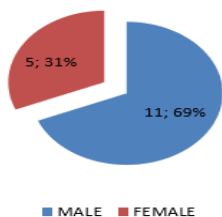


Figure 1. Characteristics of the Patients by Gender at Krembung Primary Health Care in 2018

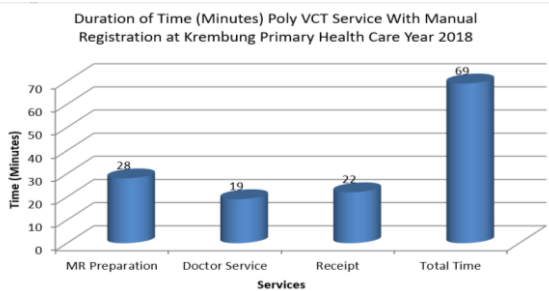


Figure 2. Duration of Time taken for the Poly VCT Service through Manual Registration at Krembung Primary Health Care in 2018

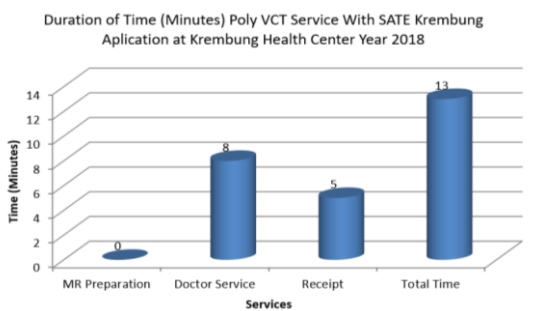


Figure 3. Duration of Time Taken to Obtain the Poly VCT Service with “the SATE Krembung” Application at Krembung Primary Health Care in 2018

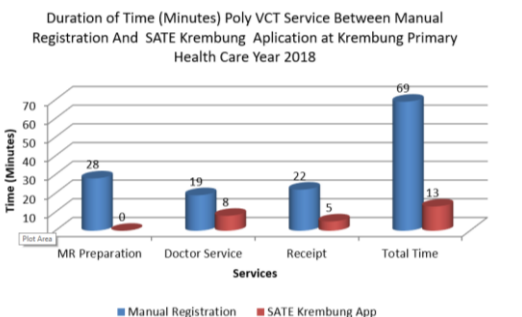


Figure 4. Duration of Time taken for the Poly VCT Service between the Manual Registration and “the SATE Krembung” Application in the Krembung Primary Health Care in 2018

patients who plan to take medicine at Krembung Primary Health Care.

## DISCUSSION

Looking at the long time needed to get access to the ART services, we are trying to implement “the SATE Krembung” application service for patients alongside the ART services in order to allow them to get fast and quality service on their next visit.

There is a significant change in the service time with the use of “the SATE Krembung” Application for all poly ART service patients.

Another benefit that can be taken from using this application is that it can reduce the Lost Follow Up (LFU) rate in HIV patients in Krembung Health Center by 0%. When evaluating the patients with the interview technique, the LFU decline was found to be due to several factors.

1. The patient feels comfortable and more secure about their privacy
2. The patients do not need to linger for treatment (time efficiency)
3. The patients can order a schedule of controls for a month before within the application
4. The patient does not need to queue again
5. The clerk can remind them of the time of the patient's visit if the patient forgets through Whatsapp

This result can be compared with the LFU numbers on the ART service users that have not used other online-based services. This can be seen in the results of the evaluation of the LFU ART services in 4 large Primary Health Care centres which provide ART services in Sidoarjo, Porong Primary Health Care at 20.6%, Taman Primary Health Care at 8.8%, Waru Primary Health Care at 0% and Sidoarjo Primary Health Care at 38.7%.

In addition, the use of “the SATE Krembung” application can also increase adherence by up to 100% in the patients receiving the ART services at Krembung Primary Health Care. This can be compared to the adherence to ARTs among the other ART services in other Sidoarjo regencies such as Porong Primary Health Care at 75%, Krian Primary Health Care at 79.2%, Sidoarjo General Hospital at 34.8% and Waru Primary Health Care at 90.5%. This number may still change again with the increase in the number of patients and others because of the factors that affect the level of adherence. However, it is expected that the use of this application can increase the patient's level of satisfaction and the comfort of the patients when it comes to accessing ART regularly.

Based on the statistical analysis through the IBM SPSS statistical version 21 application, it was found that the mean total time for treatment for the HIV patients in Krembung Primary Health Care from the time that they arrived at the Puskesmas through to obtaining drugs with the “SATE Krembung” application queue was 12,875 minutes. The total treatment time through the manual registration route amounted to 68,8125 minutes. The independent sample t test obtained a significance value of (p) 0.0001 < α=0.05 with an F value of 23.217. This means

that there is difference in the total time of service between the manual registration and when using the "SATE Krembung" application. This can thus reduce the total treatment time for the HIV patients who plan to seek treatment at Krembung Primary Health Care.

Another analysis of the benefits of "SATE Krembung" application is that the level of adherence to the INH prophylaxis therapy (IPT) by the HIV patients in Krembung Primary Health Care focused on 4 people was also 100 percent following the patient's adherence to ART. Therefore by utilizing this application, it is expected that INH prophylactic therapy can be achieved and that it can prevent infection from Mycobacterium tuberculosis. This thus reduces the morbidity of HIV patients due to Tuberculosis infection. For the IPT in TB incidence, it was found that IPT in people who are living with HIV-AIDS had a significant protective effect, where the incidence of TB in PLHIV was 0.21 times (IRR 0.21, 95% CI 0.023-0.881, p 0.008) lower than non-exposed patients. In this study, IPT decreased the TB incidence rate by 79%. (Satiavan et al., 2018) Oral candidiasis and pulmonary tuberculosis were the most common opportunistic infections found in Airlangga University Hospital. (Asmarawati, Putranti, Rachman, Hadi, & Nasronudin, 2018).

With the use of this application, 5 patients with opportunistic infections (OI) were found in which 3 HIV patients with OIs recovered and did not repeatedly contract the previous OI. In addition, with the use of this application, the level of adherence to taking OAT in the HIV patients with category 1 TB can be controlled and the patients were thus not late taking the OAT along with ART. One patient, a HIV patient with category 2 OI TB undertaking oral Streptomycin and OAT injection therapy, also experienced 100 percent compliance levels even though in the OAT therapy before this application, the patient experienced TB therapy failure twice.

With the use of this application, the patients can also mention any complaints received due to ART. They can mention it on the online form in the complaints column so then the doctors can anticipate the side effects of FDC drug use earlier, so the handling complaints of the drug side effects can be treated early. This is so then the level of adherence to ART is also good.

Using this application, the HIV patients can use the features contained within the application such as reporting the presence of patients suspected of tuberculosis. This can increase the rate of HIV testing in Krembung Primary Health Care. This is due to a policy that requires the patients with TB to be tested for HIV so then it can be detected early and treated as soon as possible. In addition, HIV patients who have "the SATE Krembung" application can play an active role in promotive and preventive public health efforts through other features in the application

## CONCLUSION

The use of "the SATE Krembung" application in the HIV Support and Treatment Care program in Krembung Primary Health Care could shorten the service time. This could improve the adherence of the patients with HIV AIDS in taking drugs, thus reducing the number of Lost Follow Up (LFU).

The "the SATE Krembung" application can improve the quality of service offered in Krembung Primary Health Care related to both public good services and private good services.

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