



## Socio-demographic Factors Associated with Loss to Follow up Anti Retro Viral Therapy among People Living with HIV and AIDS in Semarang City

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### Article Info

#### Article History:

Accepted 19 January 2020  
Approved 29 July 2020  
Published 23 December 2020

#### Keywords:

Loss to follow up,  
Antiretroviral, Human  
Immunodeficiency Virus

### Abstract

Longlife Anti Retro Viral (ARV) treatment is an important component of Human Immunodeficiency Virus (HIV) care. Loss to follow up (LTFU) defined as not taking ARV refill for 3 months or longer from the last attendance for refill and not yet classified as dead or transferred out, this causes morbidity and mortality related to Acquired Immune Deficiency Syndrome (AIDS). The incidence of LTFU in ARV therapy among people living with HIV and AIDS (PLWHA) in Semarang City 924 people (21%) (WHO target LTFU <20%). The aim of this research is to analyze education level, employment status and distance from residence to health services that affecting loss to follow-up of ARV therapy among people living with HIV and AIDS in Semarang City. The research used case control design. The sample of the research was 134 (67 cases and 67 controls) respondents obtained by purposive sampling technique. Technique for collecting the data were interview and questionnaire. Chi square and logistics regression test were used in analyzing the data. The result of the research showed that there were significant influences in the variables of education ( $p = 0.000$ ), employment status ( $p = 0.000$ ), distance from home to health services ( $p = 0.009$  affect loss to follow up of antiretro viral therapy among people living with HIV and AIDS in Semarang City. Multivariate models showed the most influential factors was education level ( $p = 0.000$ . OR = 6.270). A treatment literacy program should be emphasized to people living with HIV and AIDS who are starting treatment and during treatment ARV.

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## INTRODUCTION

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) remain one of the most significant challenges and problems of public health in the world. HIV epidemic not only affects individual health but also affects the family, community and development and economic growth of a country (WHO., 2019).

Access to antiretroviral therapy (ARV) is key global effort to end the AIDS epidemic as a public health threat 2030. People living with HIV and AIDS (PLWHA) who know their status, adherence to ARV therapy, maintain undetectable viral load can live long, healthy lives and no risk of transmitted HIV to others. Mortality rates and infections decreased when using a high ARV regimen, especially in the early stages of the disease. WHO recommends ARV as soon as possible for everyone after the diagnosis of HIV without limitation the number of clusters of Differentiation 4 (CD4). Long term ARV therapy is an important component of HIV treatment. WHO recommends loss to follow up (LTFU) is a period of 90 days after the last take of the ARV, including those who have died or moved themselves without informing the health care (WHO., 2019). PLWHA who had adherence anti retro viral therapy then 3 months did not return to the care service, support and treatment is categorized as loss to follow up (Ministry of Health RI., 2014). The problem of loss to follow up is a major challenge causes drug resistance, reduce the benefits of immunological treatment, increase morbidity and mortality related AIDS (Gesese et al., 2017). Achieving optimal clinical and public health from anti retro viral therapy requires consistent long term adherence (Ford et al., 2010). The percentage of loss to follow-up in the first year of ARV therapy became an indicator of the success of ARV therapy. WHO has the recommendation of target loss to follow up in the first one year of treatment < 20% (Tran et al., 2013).

Indonesia is committed with other countries to carry out fast track approach the 90-90-90 by detecting infected people in 90% of

people suspected of being infected, 90% of HIV positive persons are on ART, and being able to reach an undetectable virus in 90% of people who take ARV. This fast track approach is expected to reduce the number of new HIV infections, in accordance with the achievement of sustainable development or Sustainable Development Goals (SDGs) (Ministry of Health RI., 2019).

By the end 2018, the World Health Organization estimated that globally about 37.9 million people were living with HIV, 36.2 million were adults (18.8 million female and 17.4 million male), 1.7 million are children  $\leq$  15 years old and 23.3 million people (62%) people received ARV, 38% did not access ARV, it showed that there was a gap in the access of ARV therapy at the global. Health service factors, long distance from residence to healthcare, direct and indirect costs of treatment, lack of information on treatment instructions, limited knowledge on the of infection and treatment of HIV is a predictor of LTFU anti retro viral therapy (WHO., 2019).

Sociodemographic factors include younger age and marital status; clinical factors such as poor nutritional status, lower CD4 count, TB coinfection, stadium infections, problems in the service, and accessibility to the service are some predictors of the causes of LTFU (Berheto et al., 2014). Employment status, substance/narcotic abuse, not receiving isoniazid prophylaxis, ambulatory functional status, has infection, has CD4 count 201 – 349 cells/  $\mu$ L to be a significant predictor of LTFU anti retro viral therapy (Mekonnen et al., 2019). Ministry of Health RI reports 2019 that LTFU: 52,271 people (22%). Central Java Provincial Health Service report that the number of LTFU: 3,073 (24%).

Based on research in hospital Dr. Sardjito Yogyakarta 2016 states 190 patients as a student, the distance from home to health care  $\geq$  10 kilometers and the use of health insurance is a factor that affects LTFU (Handayani et al., 2017.)

Semarang Health Office report from 1995- 2019 LTFU 924 people (21%). Care, support and treatment services of HIV there are 7 hospitals, 1 Community Health Center and 10 primary health centers in Semarang. Efforts to expand access antiretroviral to get closer and

increase adherence at PLWHA in anti retro viral therapy (Semarang Health Office., 2019).

Based on research in hospital Kariadi Semarang by Rosiana in 2014 stated that from 52 patients loss to follow up, 16 (30.8%) death 28 (53.8%) still alive and 8 (15.4%) cannot be traced. Patients stop anti retro viral therapy causes work factors or daily activities, poor patient perception, alternative medicine, religious beliefs, side effects of drugs, voluntary counselling and test clinics affordability, unsatisfactory voluntary counselling and test clinics clinic services and lack of social support (Rosiana et al., 2014).

The high cases of LTFU in national (22%), Central Java province (24%) and the Semarang city (21%). That exceeds the LTFU target set by WHO which is less than 20%. That exceeds the target of LTFU set by the WHO is less than 20% and the impact of public health, a serious problem the program of HIV and AIDS, so that the necessary analysis of factors that affect the incidence of loss to follow up ARV therapy among people living with HIV and AIDS in Semarang, for anticipation and prevention through early intervention to increase the adherence of ARV therapy.

## METHODS

Design of this study was observational with case-control study. The population was HIV and AIDS patients who were recorded in HIV care, support and treatment services at the primary health centers and hospitals in Semarang City, Central Java Province, Indonesia during 2016-2018 period who adhered on ART and LTFU. Patients who did not take anti-retroviral for 3 months were defined as LTFU while those regularly take anti retro viral for 3 months became the controls. The study samples consisted of 67 cases and 67 controls. The sampling technique was purposive sampling. The independent variables of this study were level of education, employment status, distance from the health facility. The dependent variables of the study was HIV and AIDS patients who are loss to follow up of ART. Data collection was carried out by interviews using structured questionnaires.

Univariate analysis was carried out to describe using frequency distribution. Chi-squared tests were used to measure the significance. Multivariate analysis using a logistic regression was performed to identify factors associated with LTFU.

## RESULT AND DISCUSSION

Based on the results of the frequency distribution in table 1 it can be seen that the majority of respondents have a low education level of 81 (60.4%) compared to those of higher education 53 (39.6%). More respondents worked 73 (54.5%) than those who did not work 61 (45.5%). Most respondents have a distance from home to health services  $\leq 5$  km 71 (53%) compared to a distance of  $> 5$ km 63 (47%).

**Table 1.** Frequency Distribution of Socio-demographic Factors Associated with Loss to Follow up ARV Therapy among People Living with HIV and AIDS in Semarang.

| Variables                                | F  | %    |
|------------------------------------------|----|------|
| <b>Education Level</b>                   |    |      |
| Low Education                            | 81 | 60.4 |
| High Education                           | 53 | 39.6 |
| <b>Employment Status</b>                 |    |      |
| Unemployed                               | 61 | 45.5 |
| Employed                                 | 73 | 54.5 |
| <b>Distance from the health facility</b> |    |      |
| $\leq 5$ km                              | 71 | 53.0 |
| $> 5$ km                                 | 63 | 47.0 |

Based on table 2, education level has a significant relationship with loss to follow up ARV Therapy among people living with HIV and AIDS in Semarang ( $p=0,000$ .OR=8,553). The results of this study showed that low education has more LTFU than those with higher education. Some research also shows that low education increases the incidence of LTFU (aHR 1,3; 95% CI 1,1- 1,6) (Alvarez-uria et al., 2013; Bucciardini et al., 2017; Marson et al., 2013).

**Table 2.** Bivariate Relationship of Socio-demographic Factors Associated with Loss to Follow up ARV Therapy among People Living with HIV and AIDS in Semarang.

| Variables                         | Cases |      | Control |      | Total | * <i>P</i> -<br><i>Value</i> | OR    |
|-----------------------------------|-------|------|---------|------|-------|------------------------------|-------|
|                                   | F     | %    | f       | %    |       |                              |       |
| Education Level                   |       |      |         |      | 134   |                              |       |
| Low Education                     | 5     | 83.  | 25      | 37.  |       | 0.00                         | 8.553 |
| High Education                    | 6     | 6    | 3       | 3    |       | 0                            |       |
| Employment Status                 |       |      |         |      | 134   |                              |       |
| Unemployed                        | 1     | 28.  | 42      | 62.  |       |                              |       |
| Employed                          | 9     | 4    | 7       | 7    |       |                              |       |
| Distance from the health facility |       |      |         |      | 134   |                              |       |
| <=5 km                            | 4     | 64.2 | 28      | 41.8 |       | 0.009                        | 2.49  |
| > 5 km                            | 3     |      |         |      |       |                              | 6     |
|                                   | 2     | 35.8 | 39      | 58.2 |       |                              |       |
|                                   | 4     |      |         |      |       |                              |       |

\* Chi-square test

Poor education is a factor in the incidence of LTFU in Ethiopia (Hønge et al., 2013). Patients with low levels of education find it difficult to understand pre-counseling which includes information of HIV infection, treatment purposes, risks and benefits of therapy, side effects, resistance and comprehensive adherence. Education <16 years is significantly related to loss to follow up. The shorter the education time, the risk of LTFU is also greater. People with low education may have employment-related problems such as not having time to take a rest from work and clinic visits (Krishnan et al., 2011). A retrospective observational study at primary health clinic in Masaka Uganda also showed patients with low education associated with higher LTFU, because patients might have difficulty reading text reminder messages and some communication, information and other educational materials in health facilities that emphasize the need for further care (Kiwauka et al., 2020).

Patients who have low education are more likely to failure treatment because they do not understand treatment instructions and end in death (Girum et al., 2020). Highly educated among people living with HIV and AIDS are

more motivated to adherence ARV therapy because of their ability to understand laboratory results and information about HIV treatment (Krishnan et al., 2011). People who have education are better able to break away from tradition to take advantage of modern ways of securing their own health. The role of appropriate education can reduce LTFU needs to be further studied (Panditrao et al., 2011). Research in Nepal showed that education factors influence adherence to ARV therapy, so it can be explained that having a higher level of education is more likely to result in good adherence compared to low education (Bam et al., 2015).

Based on table 2 showed employment status has a significant relationship with Loss to Follow up ARV Therapy among people living with HIV and AIDS in Semarang ( $p=0,000$ .OR=0,236). This study was obtained from respondents who were asked related to financial assistance to access health services and also the feasibility to obtain permission from the employers to visit health facilities. These constraints caused the approval of PLWHA in accessing care services to be low and end up increasing LTFU. The results of this study are consistent with research conducted in Ethiopia that 51.4% of HIV patients always skip treatment or do not take medication for work reasons (Megerso et al., 2016). Likewise, a study in Kenya explained that 43.8% of HIV patients did not take medication due to busy work factors (Ochieng-ooko et al., 2010). Study in Africa explains that LTFU was higher in someone who works every day through the day at work and does not have enough time to come to a health facility for follow up. Because of the nature of their work, they are also more mobile and do not have a constant workplace ending with LTFU (Marson et al., 2013).

Five patients LTFU (23.8%) said that they did not take ARV drugs because they were busy working and had workplaces outside the city so they could not visit the voluntary, counselling and testing clinic at RSUP Dr Kariadi (Rosiana et al., 2014). Similarly, the Helen Bygrave et al cohort study in South Africa found treatment failure rates among migrant workers compared

with the general population in the first year of treatment, with significant differences observed after one year. Mobility is recognized as the reason why patients became LTFU (Bygrave et al., 2010).

The results of this study are not in line with several existing studies that limited resources are the most reason given by patients who do not return to the clinic due to financial problems and fear of paid care by health services (Ware et al., 2013). Unemployed patients have a 51% to become LTFU (HR 1.51, 95% CI: 1,34-2,00) (Montaner et al., 2014). Research at the hospital East Ethiopia showed that no having work influences the incidence of LTFU (Mekonnen et al., 2019). Studies also show patients who are homeless at risk for LTFU (Alvarez-uria et al., 2013).

Based on table 2 showed distance from home to health care facility was significantly associated with LTFU ARV Therapy among people living with HIV and AIDS in Semarang ( $p=0,009$ . OR=2,496). Majority of LTFU patients was live  $\leq 5$  kms from health facilities. There might be other factors that influence the incidence of LTFU which related to daily activities. The result of this study was not in accordance with some of the studies which explain that longer distances from health facilities reduced client access because they have to spend more money and time for travel. Although most of HIV services are offered free of charge, indirect costs are a barrier to client retention in care. The same study also states that distance is a predictor of LTFU ( $> 5$  km vs  $< 1$  km: aHR = 2.6 95% CI 1.9-3.7 with  $p < 0.01$ ) (Hassan et al., 2012). Other studies showed longer distances, long travel times and high transportation costs are the main barriers to access to HIV care (Ochieng-ooko et al. 2010).

Research at the hospital. Dr. Sardjito of the Province Yogyakarta stated that a distance of  $\geq 10$  km (AHR = 1.58; 95% CI = 1:09 - 2:31) affected the incidence of LTFU for ARV therapy (Handayani et al., 2017). Distance more than 5 km to the clinic (aHR = 1,25, 95% CI 1,001,55) (Bekolo et al., 2013). Travel time more than 1 hour to ARV service is also related to LTFU (HR

1,11 (95% CI 1,04-1,19) (Ochieng-ooko et al., 2010).

Research in Nairobi- Kenya showed that patients who lived between 5 - 10 kms from the clinic has a doubled increase in LTFU compared to those who were within 5 kms away (HR = 2.17; 95% CI: 1.09, 4.34) (Conley et al., 2012). Research at Sheka Zonal Hospital - Ethiopia states that the distance of a house  $\geq 10$  km 1.28 times increases the risk of LTFU (Shaweno., 2015).

Based on the table 3, results of multivariate analysis, it was found that the loss to follow up of anti retro viral therapy among people with HIV and AIDS in Semarang city of was influenced by 2 factors are education level and employment status. Of the two variables that most influence the incidence of loss to follow up anti retroviral therapy among people living with HIV and AIDS is education level with  $p$ -value = 0,000. OR = 6,270 it means the low education has six times the odds of being LTFU of anti retro viral therapy among people with HIV and AIDS in Semarang compared to high education.

**Table 3.** Logistic Regression of Socio-demographic Factors Associated with Loss to Follow up ARV Therapy among People Living with HIV and AIDS in Semarang.

| No | Variables                      | OR    | P-Value |
|----|--------------------------------|-------|---------|
| 1  | Education Level                | 6.270 | 0.000   |
| 2  | Employment Status              | 0.250 | 0.003   |
| 3  | Distance to to Health Facility | 1.455 | 0.426   |
|    | Konstanta                      | 9.083 | 0.308   |

## CONCLUSION

Based on the results of research on Socio-demographic factors associated with loss to follow up ARV therapy among people living with HIV and AIDS in Semarang, it was concluded that most respondents were low education (60,4%), employed (54,5%), distance to health facility  $\leq 5$ kms (53%). There is a relationship between the level education, employment status and distance of to health facility with loss to follow-up anti-retroviral therapy among people with HIV AIDS in Semarang city. The most

influential factor of loss to follow up anti retro viral therapy in people with HIV AIDS in Semarang City is the education level with an OR=6,270.

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