13. Disobedience in Medication and Opportunistic Infection as Lead Factors to HIVAIDS Mortality at Kencong Public Health Center, Jember.pdf

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Disobedience in Medication and Opportunistic Infection as Lead Factors to HIV/AIDS Mortality at Kencong Public Health Center, Jember

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ABSTRACT

Acquired Immunodeficiency Syndrome (AIDS) is defined as a set of symptoms due to decreased immunity caused by the Human Immunodeficiency Virus (HIV). One of the sub-district in Jember which has the highest HIV/AIDS mortality is Kencong with the death number was 55.88% by January-July 2019. The purpose of this research was to analyze related factors to HIV/AIDS mortality at Kencong Public Health Center. Data were collected from HIV/AIDS patients' medical record documents with 51 samples consisting of 17 samples from the case group and 34 samples from the control group. Analysis data conducted by Chi-Square test using a case-control approach. The results showed that there was a correlation between disobedience in medication and HIV/AIDS patients' mortality, with p=0,000 and risk of death at 15,682 times OR (Odds Ratio). Likewise, there was a correlation between the patients' opportunistic infection and the HIV/AIDS patients' mortality, with p=0,004 and risk of death at 5,958 times OR. However, the variables of sex, age and level of education did not have any correlation with HIV/AIDS patients' mortality. Kencong Public Health Office should encourage HIV/AIDS patients to improve medication adherence so can reduce the chance of opportunistic infections.

Ketidakpatuhan dalam Pengobatan dan Infeksi Oportunistik sebagai Faktor Penyebab Kematian Pasien HIV / AIDS di Puskesmas Kencong, Jember

ABSTRAK

Acquired Immunodeficiency Syndrome (AIDS) didefinisikan sebagai sekumpulan gejala akibat penurunan kekebalan yang disebabkan oleh Human Immunodeficiency Virus (HIV). Salah satu kecamatan di Kabupaten Jember yang memiliki angka kematian HIV / AIDS tertinggi adalah Kencong dengan angka kematian 55,88% pada Januari-Juli 2019. Tujuan penelitian ini adalah menganalisis faktor-faktor yang berhubungan dengan kematian HIV / AIDS di Puskesmas Kencong. Pengumpulan data dilakukan dari dokumen rekam medis pasien HIV / AIDS dengan 51 sampel yang terdiri dari 17 sampel dari kelompok kasus dan 34 sampel dari kelompok kontrol. Analisis data dilakukan dengan uji Chi-Square dengan menggunakan pendekatan case-control. Hasil penelitian menunjukkan bahwa ada hubungan ketidakpatuhan dalam pengobatan dengan kematian pasien HIV / AIDS, dengan p = 0,000 dan risiko kematian sebesar 15.682 kali OR (Odds Ratio). Demikian juga terdapat hubungan antara infeksi oportunistik pasien dengan kematian pasien HIV / AIDS, dengan p = 0,004 dan risiko kematian sebesar 5,958 kali OR. Namun variabel jenis kelamin, usia dan tingkat pendidikan tidak memiliki korelasi apapun dengan angka kematian penderita HIV / AIDS. Dinas Kesehatan Kencong harus mendorong pasien HIV / AIDS untuk meningkatkan kepatuhan minum obat sehingga dapat mengurangi kemungkinan terjadinya infeksi oportunistik.

INTRODUCTION

The number of people with HIV / AIDS is increasing and becoming a global pandemic. Human Immunodeficiency Virus (HIV) is a virus that destroy the immune system by infecting and ruining CD4 cells. The more CD4 cells that are ruined, the weaker the immune system will be, making it vulnerable to various diseases called Acquired Immunodeficiency Syndrome (AIDS). AIDS is the final stage of HIV infection. At this stage, the body's ability to fight infection has been lost. Data of United Nations Programme on Acquired Immune Deficiency Syndrome (UNAIDS) reported 29 million world population infected with HIV with 1.7 million deaths (Sumantri *et al.*, 2012). According to regional data, World Health Organization (WHO) reports that the highest death toll from HIV / AIDS was in Africa, at 720,000, while the lowest was in the East Mediterranean at 17,000. Deaths of people live with HIV / AIDS (PLWHA) become the top five causes of mortality in children and adults in the world, and are still the largest contributor for causing global burden disease. It has never reached zero.

The number of HIV / AIDS cases in Indonesia according to data of joint United Nations Programme on HIV/AIDS (UNAIDS) in 2012 become the third largest in Asia Pacific after India and China. Moreover, the cumulative number of HIV cases reached 127.416 people and AIDS 52.348 people with a mortality rate of 9.585 people by 2013. East Java is one of provinces in Indonesia which has the first place in HIV cases (8.204 cases), the fifth highest for people with AIDS (741 cases) and most of them were male 62% (P2PL, 2017). The causing factors of HIV transmission are multiple sexual partners, injecting drug users, transmission of homosexual partners, and blood transfusions. As the disease progresses, the immune system decreases so people with HIV / AIDS are susceptible to various opportunistic infections (Puspitasari *et al.*, 2016).

Jember Regency is one of regencies in East Java with the fifth highest number of HIV / AIDS cases (Arif, Ariyanto and Ramani, 2016). The fluctuating incidence of trends in the number of people living with HIV/AIDS (PLWHA) keep high from 2014 to 2018. By 2014 the number of PLWHA were 522 cases, 2015 were 669 cases, 2016 were 567 cases, 2017 were 644 cases, and 2018 significantly decreased 208 cases. Nevertheless, the number of people living with HIV / AIDS may not be able to describe the actual condition because of the limited data available and the difficulty of access to high-risk groups.

Based on data from Jember Health Office in 2004 – 2018, there were 32 sub-districts of Jember Regency that have HIV-positive patients. There were 5 Districts with the highest HIV / AIDS sufferers i.e., Puger with 416 cases, Gumukmas with 238 cases, Wuluhan with 234 cases, Kencong with 220 cases, and Kaliwates with 179 cases. However, Kencong is one of sub-districts which had the highest mortality cases due to HIV/AIDS with 45 mortality (male and female). Based on data obtained by researchers at the Kencong Public Health Center, Jember, the mortality rate of people with HIV / AIDS tends to increase every year i.e., in Juni-Desember 2017 were 8,82% PLWHA died, in Januari-Desember 2018 were 35,29% PLWHA

died and in Januari-Juli 2019 were 55,88% PLWHA died. The causing factors of HIV / AIDS mortality in Kencong were opportunistic infections, high stress levels, and patient was late for treatment because he / she came to the Public Health Center having entered the AIDS stage. This is consistent with the research conducted by (Matdoan, Sialana and Bension, 2019) which stated that immune system infection triggers immunosuppressive conditions that lead to opportunistic infections, so the death in HIV sufferers is not actually caused by HIV but due to AIDS or opportunistic infections. Other researchers mentioned the factors that trigger death in other HIV / AIDS sufferers were age, sex, BMI, anemia, CD4 cell count, VL, opportunistic and malignancy of infections (Sumantri *et al.*, 2012). Based on the description above, the researcher is interested in conducting research on " Disobedience in Medication and Opportunistic Infection as Factors Lead to HIV / AIDS Mortality: Case Study at Kencong Public Health Center, Jember".

METHOD

This research is a quantitative analytic study using chi-square test, with a case control approach. This study tried to explore how and why the incidence of mortality in HIV / AIDS patients could be occured using a retrospective study design. The sample in this study were 51 medical record documents consisting of 17 cases and 34 control groups. The sampling was done using simple random sampling with a lottery technique.

The independent variables in this study were age, sex, education, non-adherence to taking medication and opportunistic infections, while the dependent variable was HIV / AIDS mortality. Data were collected by observation on medical record documents of HIV / AIDS patients by giving a sign ($\sqrt{}$) on the checklist sheet. The collected data were analyzed using SPSS with univariate analysis and bivariate analysis. The significance test value for this study is = 5%. There was a relationship if the p-value (probability value) ≤ 5%, whilst, the results of the study, showed no relationship if the p-value > 5%.

This research has received Ethical Clearance from the Committee of Ethical Approval in the Health Department of Politeknik Negeri Jember, regarding the protection of Human Rights and welfare in health research with number 12508/PL17/PG/2020.

RESULTS AND DISCUSSION

Based on results, on the incidence of HIV / AIDS mortality in Kencong Public Health Center, Jember Regency, the 51 medical record documents were consisting of 33.3% medical record documents from HIV / AIDS patients who died and 66.7% medical record documents of living HIV / AIDS patients.

Table 1
Overview of HIV / AIDS Mortality Cases (N=51)

Kejadian Mortalitas	Total	Percentage (%)
Mortalitas	17	33,3
Hidup	34	66,7

It showed that the number of samples of HIV / AIDS patient mortality was smaller than the number of samples of living HIV / AIDS patients. It could be happened because there were many patients who received treatment in Kencong Public Health Center but had lost to follow up. Those patients were referred to hospital, so the mortality data were not recorded by Kencong Public Health Center.

Table 2.
Frequency Distribution of HIV/AIDS Mortality Risk Factors (N=51)

Variable	Total	Percentage (%)
Age (years old)		
15-49	50	98,0
≤ 14	1	2,0
Gender		
Male	32	67,2
Female	19	37,3
Level of Education		
Low (<Senior High School)	38	74,5
High (≥Senior High School)	13	25,5
Disobedience in Medication		
Obedient	25	49,0
Disobedient	26	51,0
Opportunistic Infections		
PLWHA with OI (diarrhea / oral candidiasis / tuberculosis)	19	37,3
PLWHA without OI	32	62,7

Age of Patients

The patient's aged 15-49 years old were 98,0% and the samples aged ≤14 years old were 2,0%. Age 15-49 years had the largest number of samples for the incidence of HIV / AIDS mortality which in line with the research conducted by (Matdoan, Sialana and Bension, 2019) that stated HIV/AIDS mortality more often occured in the age range 15-49 years (90.14%) and the lowest age at death is ≤14 years (2.95%).

This could be influenced by the high prevalence of HIV / AIDS risks on this age group such as high sexual activity, sharing of needles and syringes. Other researchers have also suggested that the risk of death increases with age, older age has been confirmed as a strong negative prognostic factor for early death (Suligoi *et al.*, 2015).

The results of statistical tests using Fisher Exact Test showed that the value of Sig (p) 1,000 > = 0,05 which means there was no relationship between age with thw incidence of HIV / AIDS. The velaue of OR 1,515; 95%CI (1,242-1,849) which means that those aged 15-49 years had HIV / AIDS mortality risk 1,5 greater than those aged ≤14 years.

This result was in accordance with research that conducted by (Kebebew and Wencheko, 2008) in Ethiopian Armed Forces General Teaching Hospital stated that age has no significant relationship with HIV / AIDS mortality (p=0,129 > = 0,05). In research conducted by (Biadgilign, Reda and Digaffe, 2012) also stated that age has no significant relationship with HIV / AIDS mortality (p =0,156 > a 0,05) (95% CI: 0,99-1,05).

Age does not affect mortality from HIV / AIDS, (Althoff, 2016) showed other external factors which affect HIV / AIDS mortality were smoking, alcohol and drug abuse habits. Alcohol is associated with a physiological weakness risk which can lead to mortality among people infected with HIV / AIDS. Furthermore, people with HIV / AIDS are at risk of cardiovascular disease (CVD) 1,5-2 greater regardless of age strata. It is because of HIV-1 RNA virus which detected, the amount of CD4 and ARV regimens. The same result was found in research conducted by (Bernard *et al.*, 2018) that stated poor clinical condition at initiation of antiretroviral therapy, CD4, Hb level, dan Body Mass Index (BMI) were associated as a predictor of mortality unrelated to age grouping.

Gender

Most of samples were male (67,2%) and female samples were (37,3%). It was due to more male patients than female patients living with HIV / AIDS. So, the amount of HIV / AIDS mortality in male patients were higher.

Matdoan et al also stated that more deaths occurred in male patients, as 67.48% compared to women 32.51%. This can be due to the high prevalence of HIV / AIDS sufferers in men, the ratio of HIV / AIDS sufferers between men and women is 3 : 1 (Matdoan, Sialana and Bension, 2019). The high mortality rate in men than women might be due to those female patients tended to know about their HIV status at earlier stage and started antiretroviral therapy with a better CD4 cell count compared to men (Seyoum *et al.*, 2017).

From the Chi-Square analysis test, it shows that there is no relationship between sex and HIV / AIDS mortality in Kencong Public Health Center with the P value 0,682. The value of OR 0,779; 95%CI (0,236-2,574) which means male has mortality risk due to HIV/AIDS 0,7 lower than female.

Research conducted by Puspitasari also stated that sex has no evidence as mortality predictor due to HIV / AIDS (Puspitasari *et al.*, 2016). Another research by Ogoina et al which showed male gender could be used to help assess the risk of death of HIV / AIDS patients, also stated that sex was not a predictor of HIV / AIDS mortality (Ogoina *et al.*, 2014). Gender has no relationship with HIV / AIDS mortality, this may be related to anatomical physiological point of view. Female reproductive organs are very delicate so it is easy to get injuries that can accelerate the entry of germs and facilitate unconscious infection. Moreover, sexual violence can increase the risk of sexually transmitted disease because physical trauma during sex. Another factor is Female Sexual Workers (FSW) habit which become the major trigger in increasing of HIV / AIDS incidence. Most of FSW in localization and non-localization were inconsistent in using condoms (Susilowati, 2011). Based on research conducted by

(Adeoti, 2019) in Nigeria showed 58% PLWHA were female. The underlying reasons why women were more infected than men in Nigeria had been linked to gender inequalities in society, culture and applicable laws. Besides that, women who are predominantly young may be more sexually active.

Level of Education

The number of PLWHA who had low education were 74,5% and PLWHA who had high education were 25,5%. people living with HIV/AIDS (PLWHA) who has low education (those who get 5 years of education or less) have a higher risk of death (OR=1,25) compared with 6-8 years of education. This is in accordance with the theory which says that education consists of a teaching and learning process that can change individuals from not knowing to knowing. Thus education can affect changes in individual behavior (Suligoi *et al.*, 2015).

The result of statistical relationship analysis test using Fisher Exact Test, showed that the Sig (p) value of education is 1,000> = 0,05, which means that there is no relationship between education and HIV / AIDS mortality in Kencong Public Health Center, Jember Regency. The value of OR 1,170; 95% CI (0.302-4.536), which means that the low education category (<Senior High School) has HIV / AIDS mortality risk of 1.1 times greater than the higher education category (≥ Senior High School).

According to research conducted by (Kebebew and Wencheko, 2008) Ethiopian Armed Forces General Teaching Hospital stated no relationship between education and HIV / AIDS mortality with value of p (=0,100). The same result is also found in the research of (Garriga *et al.*, 2015) which stated that education has no relationship with HIV / AIDS mortality, with low education category (p=0,174) > = 0,05 and high education category (p=0,143) > = 0,05.

In theory, a person's level of knowledge is influenced by the level of education. A person's level of education will affect in understanding an information or knowledge he or she obtains. Usually, the higher level of education a person will be easier to capture and understand the information. But for this study it turns out that many are low educated but have knowledge of HIV / AIDS due to because they are active role in social community activity (Susilowati, 2011).

The results of interview stated that level of education has no relationship with HIV / AIDS mortality because the knowledge between respondents who have low education and respondents who have higher education are almost the same. Thus, their knowledge, ways of thinking, and anticipation to avoid HIV / AIDS are almost the same. The development of technology is certainly also associated with this, people in daily life know technology such as mobile phones, of course it can be used to find information about health, factors related to HIV/AIDS transmission and prevention. So, public tends to pay attention to their health and conduct early detection for people who have HIV / AIDS risk.

Table 3
Cross-tabulation of HIV/ AID risk factors in Kencong Public Health Center, Jember

| Variable | Mortality Status | | | | Total | | P Value | OR | 95%CI |
| | Death | | Live | | | | | | |
	n	%	n	%	n	%			
Age (years old)									
15-49	17	100	33	97,1	50	98	1,000	1,515	1,242-1,849
≤14	0	0	1	2,9	1	2			
Gender									
Male	10	58,8	22	64,7	32	62,7	0,682	0,779	0,236-2,574
Female	7	41,2	12	35,3	19	37,3			
Level of Education									
Low (<Senior High School)	13	76,5	25	73,5	38	74,5	1,000	1,170	0,302-4,536
High (≥Senior High School)	4	23,5	9	26,5	13	25,5			
Disobedience in Medication									
Obedient	2	11,8	23	67,6	25	49	0,000	15,682	3,039-80,928
Disobedient	15	88,2	11	32,4	26	51			
Opportunistic Infections (OI)									
PLWHA with OI	11	64,7	8	23,5	19	37,3	0,004	5,958	1,670-21,254
PLWHA without OI	6	35,3	26	76,5	32	62,7			

Disobedience in Medication

The number of patients who had compliance with taking drugs were 49,0% and patients who had no compliance with taking drugs were 51%. Compliance with medication is a major factor in achieving the successful treatment of HIV / AIDS virus infection and suppressing the virus in the body so that there are no more and no opportunistic infections.

Based on research conducted by Ratnasari, the death of PLWHA could be affected by disobedience in undergoing treatment antiretroviral (ARV) therapy, because by not undergoing ARV therapy, patient will experience a decrease in CD4 cell count which will make the patient often experience various effects (Ratnasari, 2019).

The chi-square analysis test showed that there was a positive relationship between disobedience in medication with HIV / AIDS mortality in Kencong Public Health Center. The value of significance was p = 0,000 < = 0,05; OR 15,682; 95%CI (3,039-80,928) which mean disobedience in taking medication had a 15.6 times greater risk of HIV / AIDS mortality than obedience in taking medication

Based on research result, those who are at risk of dying can be caused by never getting ARV therapy and never adhering to ARV therapy. This will cause decreasing in hemoglobin levels <10 g / dL, glomerulo filtration rate <60 mL/min/1,73 m² and CD4 <200 cell, make patient entering clinical stage. This is not well informed to the patient so that the patient never adheres to ARV treatment cases (Puspitasari *et al.*, 2016).

Disobedience in medication can lead to failure to suppress HIV virus replication. It increases the likelihood of mutating the HIV virus which can lead to drug resistance and ultimately increases the risk of death. Disobedience to medication appointments in the first 1 year is also assumed as indication of non-compliance with subsequent drug appointments and non-adherence to taking medication, thereby increasing the risk of death (Sitanggang et al., 2012).

Opportunistic Infections

The number of patients live with HIV / AIDS (PLWHA) without opportunistic infections were 62,7% and PLWHA with OI (diarrhea / oral candidiasis / tuberculosis) were 37,3%. Patients who experience opportunistic infections will be more susceptible to death than patients who do not experience opportunistic infections, opportunistic infections are serious diseases in immunocompetent individuals.

The cause of death in PLWHA is a progressive decline in the immune system so that opportunistic infections can appear and end in death(Putri, Darwin and Efrida, 2015). In the research conducted by Putri found a group of opportunistic infections that caused death in people with HIV / AIDS including cryptosporidium diarrhea (11.90%) with the first leading cause of death was tuberculosis (21.77%) and oral candidiasis was a manifestation of opportunistic infections, the largest co-occurring 40% of people with HIV / AIDS.

The Chi-Square analysis test showed that there was a positive relationship between opportunistic infections and HIV / AIDS mortality in Kencong Public Health Center and statistically significant with a value of p = 0.004 < = 0,05. With OR 5,958; 95% CI (1,670-21,254), which means that PLWHA with opportunistic infections have an HIV / AIDS mortality risk of 5,9 times greater than those with HIV / AIDS without opportunistic infections.

This research result was in line with research conducted by (Kebebew and Wencheko, 2008) which stated there was a significant relationship between opportunistic infections and HIV / AIDS mortality (p= 0.030 < = 0,05) and (95% CI: 1,240-65.085) and there was a significant relationship between opportunistic tuberculosis infection and the incidence of HIV / AIDS mortality with (p = 0.035 < = 0,05) with (95% CI: 1.039-2.893) at the Ethiopian Armed Forces General Teaching Hospital. Moore et al stated that tuberculosis was the most common condition associated with HIV / AIDS mortality (21% of deaths) followed by candidiasis (15%) (Moore et al., 2013).

The incidence of opportunistic infections is largely influenced by regional factors such as endemic rates of specific opportunistic infections, indications for Antiretroviral Therapy (ART) in regional guidelines, and accessibility of health services (Tanuma et al., 2016). The results of interviews conducted by researchers suggest that the causes of mortality other than opportunistic infections can also occur at high levels of stress, frustration and anxiety, the higher the level of stress the immune system will decrease and also the decline in CD4 cells which most influence HIV / AIDS so that can trigger the patient to die. This was also stated by (Adeoti, 2019) that HIV / AIDS patients tend to experience depression, anxiety disorders and insomnia. Sleep disturbances are said to be common among patients with depression, and anxiety can be linked to thoughts of illness, fear of the future and financial problems.

CONCLUSION

Based on the results of research conducted by researchers as well as results and discussion, it could be concluded that the number of medical record documents who showed died of HIV / AIDS patients were 33.3% and HIV / AIDS patients alive were 66.7%. Identification of HIV / AIDS mortality incidence could be seen that most of the respondents aged 15-49 years were 98.2%, the most of respondents were male by 67.2%, most of respondents had low education category (<high school) by 74.5%, respondents who did not adhere to taking medication were 51% and 37.3% had opportunistic infections. The Chi-Square analysis test showed that age, sex and education variables not have no significant relationship with HIV / AIDS mortality in Kencong Public Health Center, Jember. On the other hand, disobedience in medication and opportunistic infections have positive relationship with HIV / AIDS mortality in Kencong Public Health Center. This research needs to examine further other factors that might influence HIV / AIDS mortality, such as stigma, lost of follow up, and nutritional status.

Declaration of Conflicting Interests

The authors declared that no potential conflicts of interests with respect to the authorship and publication of this article.

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