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Prevalence of Neurocognitive Impairment and Its Associated Factors Among Patients With HIV in Indonesia

Nunung NURHAYATI, Chanti MELNAWATI, Diwa Agus SUDRAJAT, Linlin LINDAYANI

Department of Nursing, Sekolah Tinggi Ilmu Keperawatan PPNI Jawa Barat, Bandung Jawa Barat 40173 Indonesia,

ABSTRACT

Introduction: HIV-associated comorbidity reported more prevalence, including neuro cognitive impairment. Patients with HAND had poorest QoL. However, the impact of HAND on QoL has received little attention in the literature and remains inconsistent. **Methods:** This study was conducted using a cross-sectional design at AIDS-nongovernmental organization in West Java, Indonesia. Sample in this study was people living with HIV who undertaking antiretroviral therapy for more than 6 months, and age over 20 years old International HIV Dementia Scale (IHDS) was used to measure probable HIV dementia and The WHO Quality of Life-HIV brief version (WHOQOL-HIV Brief Version) used to assess quality of life among patients with HIV/AIDS. **Results:** A total of 150 participants agreed to join in this study with mean age was 38.09 (SD = 3.99) and 74% male. The average value International HIV Dementia Scale (IHDS) HAND using instruments 10.2 (SD = 1.58) and the average score of overall quality of life amounted to 106.1 SD (SD = 15.3; range 67-135). IHDS p-value (<0.05), jobs (<0.05), and CD4 (<0.05) and the total is the strength predictor for the quality of life with its contribution of 27%. **Conclusion:** The results showed almost half of people living with HIV had cognitive impairment. There is a relationship between HIV-Associated Neurocognitive Disorder (HAND) with the quality of life. Early detection of neurocognitive impairment risk in people living with HIV need to be conducted regularly during their clinical visit.

Keywords: Neurocognitive impairment, HIV, Quality of life, HAND

Corresponding Author:
Linlin Lindayani, PhD
Email: linlinlindayani@gmail.com
Tel: +6281384584892

INTRODUCTION

More than 36.9 million persons in the globe were infected with the human immunodeficiency virus in 2014 (1). Increases in the number of people taking antiretroviral medication have contributed to a rise in the global HIV prevalence from prior years (15 million) (ART) (1). Successful of ART has positive impact on prolonged life expectancy, at age 20 years increased from 36.1 years to 49.4 years (2). As results, HIV-associated comorbidity reported more prevalence, including neuro cognitive impairment. The prevalent of neuro cognitive impairment ranged from 7% to 70% either in developed or developing country and predicted to be continued increase along with increasing life expectancy (3–9). All cognitive domains, including general cognitive performance, speed of processing, memory, executive function, and working memory, have been shown to be affected by neurocognitive impairment (6,10,11).

Having a high level of cognitive function is indicative of an individual's capacity to acquire, retrain, and retain information, as well as their ability to perform complicated sets of intellectual functions, such as judgment and evaluation. Distinctive features of HAND include early onset memory loss and/or difficulties with executive function, processing speed, and concentration (12). Asymptomatic neurocognitive impairment (ANI), mild neurocognitive disorder (MND), and dementia due to HIV are the three types of neurocognitive impairment that have been identified (12). Evidence points to HIV-related neuroinflammation as the cause of HAND in HIV-positive patients, but other factors have also been linked to the disorder. HAND has been linked to higher HIV progression, CD4 count, viral load, and duration of HIV infection in studies (8,13–15). Importantly, it has significant impact on early mortality (16), difficulties in activities of daily living (3,7), and increase health care cost (17).

Quality of life (QoL) defined as a multidimensional concept that includes physical, psychological, social, and environmental (18). It has been established that the quality of life in HIV infection is directly related to the

severity of the disease, the severity of symptoms, and the patient's mental health (19,20). Decreased quality of life is correlated with impairments in fine motor functions, memory, mental flexibility, focus, processing speed, visuospatial skills, and building skills (21). Patients with HAND had poorest QoL (22–24). Other investigators have not found significant relationship between HAND and HRQoL (25). However, the impact of HAND on QoL has received little attention in the literature and remains inconsistent. Some studies found HAND impact on poor QoL (22,23). Others study failed to falsify significant effect of HAND on QoL (Thein et al., 2007). Therefore, assessing QoL is needed to be considered when assessing HAND in HAART era. The purpose of this study was to examine the association between neurocognitive impairment and quality of life in people living with HIV.

MATERIALS AND METHODS

Study design
This study was conducted using a cross-sectional design at AIDS-nongovernmental organization in West Java, Indonesia. Data were collected during the monthly social group meeting between February 2019 and June 2019 .

Ethical consideration
Prior to data collection, ethics committees of the Institutional Review Board (III/15/KE.STIKEP/2019) granted approval. Before beginning the survey, the consent form was discussed in detail to participants.

Sample
Sample in this study was people living with HIV who undertaking antiretroviral therapy for more than 6 months, and age over 20 years old. Pregnant women with HIV, had mental disorder, undergoing chemotherapy or radiation, had past brain injury or having a severe neurological condition were excluded from this study. Participants were selected using a convenience sampling. The sample size was calculated using G-Power Software Version 3.0.10, with medium effect size = 0.25 (Cohen, 1969), the estimation of minimum sample size was 145.

Instrument
Demographic data and Clinical variable
At the time of enrollment, sociodemographic data were gathered for the HIV study. A person's age, marital status, educational attainment, and annual income are all included. Body mass index, HIV transmission, CD4 count, HIV viral load, disease stage, years living with HIV, HAART initiation and regimen, number of co morbidities, smoking history, and alcohol consumption are all examples of clinical factors.

Cognitive function
International HIV Dementia Scale (IHDS) was used to measure probable HIV dementia. This is a bed side screening tool for HIV associated dementia. It can be used in a clinic setting and only requires 2–3 minutes to complete. Each scale ran from 0 to 12, with lower values indicating more severe mental disability. The first part of the examination consists of the examiner reading four words aloud and having the candidate repeat them verbatim. The examiner will have the candidate repeat four words over and over until they are recited correctly. The non-dominant hand's first and second fingers will be counted throughout a 5-second time period to determine how many times they tapped the surface. During this time, participants will be encouraged to open and close their fingers as broadly and rapidly as they can. Using a 4-point scale and more than 15 taps is considered typical. The alternate hand test has the subject clenching his or her fist on a flat surface, then placing the palm down flat on the surface, and finally placing the hand perpendicular to the flat surface, fifth digit against the surface. The examiner will first show this, and then the candidate will have two opportunities to practice before the actual test, which should take no longer than 10 seconds. Four sequences in 10 seconds is rated average on a scale of one to four. Recalling the four words will follow the finger tapping and alternating hand sequence portions of the test. When a student struggled to recollect a word, the teacher would give them a hint, such as "color" for the word red. In exchange for remembering a term after being given a clue, the person was awarded half a point. A maximum score of 4 will be awarded for the number of remembered words. Preliminary data suggest that a score of 10 or lower indicates cognitive impairment (26).

Quality of life
The WHO Quality of Life-HIV brief version (WHOQOL-HIV Brief Version) used to assess quality of life among patients with HIV/AIDS. This instrument was developed by the World Health Organization in English. There are four domains of the individual's perception of quality of life: physical, psychological, social relationships, and environmental (27). The WHOQOL-HIV Brief consists of 31 items with five-point in likert interval scales, 1 indicates low (negative perceptions) and 5 indicates high (positive perceptions). Domain and facet scores are scaled in positive direction where higher scores denote higher quality of life (27). Cronbach's alpha was calculated for each of the six domains, physical=0.72, social = 0.72, psychological = 0.7, and environmental = 0.82 (O'Connell & Skevington, 2012). The Cronbach's alpha WHOQOL-Brief used in the present study was 0.889 and inter-rater reliability using intra class correlation coefficient reported good agreement about 70.97% (28).

Procedure

Approvals for protection of human subjects were obtained from the Human Subject Review Committee. The study conformed to the principles outlined in the Declaration of Helsinki. Eligible participants who had a diagnosis of hypertension (referred via physicians in clinics and the directors of the communities) were invited to participate in the study. After obtaining written informed consent, the principal investigator and research assistants (RA) who had neuropsychological test training conducted the interview in a private room free of distractions at either the hospital outpatient clinic or the community center. Participants provided information regarding menopausal symptoms followed by cognitive testing. Interviews and testing required approximately 60-90 minutes. Two RAs checked the results of each participant to confirm internal agreement.

Statistical analyses

Means, standard deviations, and frequencies will be used as descriptive statistics to summarize the characteristics and main variables of the participants. Multicollinearity was evaluated using Pearson's product-moment correlation coefficients, and only statistically significant variables were included in the regression model. The total score on each cognitive subtest was used as the dependent variable in a series of multiple linear regression analyses. Factors such as age, years of schooling, body mass index, systolic blood pressure, duration of hypertension, number of hypertension medicines, number of comorbidities, and menopausal symptoms were included as independent variables. Statistical analysis was performed using SPSS for Windows, Version 21.00 (Statistical Package for the Social Sciences).

RESULTS

A total of 150 participants agreed to join in this study. Table I shows the average age was 38.09 (SD = 3.99). Male gender, there are more than half of respondents (74%). For education history the majority of respondents (98.7%) have taken level of education and (86.7%) have a job. Then the majority of respondents (76.7%) were married.

Based on table II shows the stages of HIV disease for more than half of respondents (60%) are in the stage of AIDS. The average length of life with HIV amounted to 9.47 (SD = 3.84) and most respondents had been living with HIV> 5 years. Most respondents (81.3%) were taking antiretroviral drugs> 5 years. For CD4 half of respondents (50%) have a number between 500-1200cell/mm³, then the average weight 60.4kg with (SD = 7.76) and the average height of 167.4cm (SD = 6.01), while the average BMI of 21.5 (SD = 2.25). Furthermore, most respondents (84.7%) did not consume alcohol.

Neurocognitive Impairment in people living with HIV

Based on table III above the average value International HIV Dementia Scale (IHDS) HAND using instruments 10.2 (SD = 1.58). With the highest average score of 3.55 (SD = 0.64) in the domain of memory, and the lowest average value of 3.12 (SD = 0.67) exists on the domain psychomotor speed. Based on Figure 4.1 above shows that half of the respondents (50.7%) did not have cognitive impairment. And (49.3%) had cognitive impairment. According to the table above shows the cognitive impairment is less than half of respondents (44, 1%) male sex.

Quality of Life in people living with HIV

Based on table IV above the average score of overall quality of life amounted to 106.1 SD (SD = 15.3; range 67-135) which shows high scores indicate better quality of life. With the highest average score of 29.6 (SD = 3.8) are in the psychological domain, and the lowest average value of 14.2 (SD = 3.04) in the domain of social relations.

Relationship Between Neurocognitive Impairment with Quality of Life

Based on table V showed that there is a relationship between HIV-Associated Neurocognitive Disorder with the quality of life seen from the p-value 0.00 (α = 0.001) with a correlation coefficient of (0.373), which means that the correlation is low. The highest value found in the relationship between psychomotor speed and quality of life can be seen from the p-value 0.00 (α = 0.001) correlation coefficient of (0.420), which means that the correlation being. For the lowest value contained in the relationship between motor speed with social relationships visible from p-value correlation coefficient of 0.157 (0.116) which means that the correlation is very low.

Based on table VI of linear regression results obtained IHDS p-value (<0.05), jobs (<0.05), and CD4 (<0.05) and the total is the strength predictor for the quality of life with its contribution of 27%.

DISCUSSION

The results showed 49.3% had cognitive impairment, with the highest average score of 3.55 (SD = 0.64) in the domain of memory, and the lowest average value of 3.12 (SD = 0.67) is on psychomotor speed domain. Cognitive impairment is less than half of respondents (44.1%) male sex. These results are consistent with research (29) concerning Profile Cognitive Function in Patients with HIV / AIDS in care at the hospital. Dr.Saiful Anwar Malang where there are 21.95% of the 41 respondents had cognitive impairment. Typical display classically HAND is a triad of symptoms of subcortical dementia is memory impairment, impaired psychomotor speed, depressive symptoms and movement disorders (30).

Table I : Demographic characteristics of participants (n=150)

Variables	Total n (%)
Age (mean)	38.09 3.99
Gender	
Male	111 (74)
Female	39 (26)
Level of education	
No school	2 (1.3)
School	148 (98.7)
Work	
Does not work	20 (13.3)
Work	130 (86.7)
Marital status	
Single	35 (23.3)
Marry	115 (76.7)

Table II : Clinical characteristics of participants (n=150)

Variables	Total n (%)
Stadium	
Asymptomatic	5 (3.3)
Symptomatic	55 (36.7)
AIDS	90 (60)
Years living with HIV (mean SD)	9.473.84
Range	1-19
<5 years	26 (17.3)
> 5 years	124 (82.7)
Consumption ARV	
Not	0
Yes	150 (100)
Long ARV intake (mean SD)	9.273.75
Range	1-19
<5 years	28 (18.7)
> 5 years	122 (81.3)
CD4 cell counts (mean SD)	493.3139.8
<200cell/	3 (2)
200-500cell/	72 (48)
500-1200cell/	75 (50)
Weight (mean SD)	60.4 7,76
Height (mean SD)	167.49 6.013
BMI (mean SD)	21.5 2.25
Substance use (alcohol)	
Not	127 (84.7)
Yes	23 (15.3)

Table III : Descriptive analysis of Characteristics of HIV-Associated with Neurocognitive Disorder

Variables	Mean SD	Range
Total IHDS	10.2 1.58	3-12
Domain		
Motor Speed	3.52 0.64	1-4
Psychomotor Speed	3.12 0.67	1-4
Memory Recall	3.55 0.64	1-4

Table IV : Descriptive analysis of quality of life

Variables	Mean SD	Range
Total QOL	106.1 15.3	67-135
Domain		
Physical	28.6 4.87	18-40
Psychological	29.6 3.8	17-40
Social relationships	14.2 3.04	6-20
Environment	26.4 4.15	14-34

Table V : Relationship Between HIV-Associated with Neurocognitive Disorder with Quality of Life

Independent	Dependent				
	Total QOL	Physical	Psychological	Social relationships	Environment
Total IHDS	0.373 ***	0.319 ***	0.369 ***	0.284 ***	0.340 ***
Motor Speed	0.205 **	0.179 **	0.238 ***	0.116	0.207 **
Psychomotor Speed	0.420 ***	0.343 ***	0.374 ***	0.359 ***	0.389 ***
Memory Recall	0.324 ***	0,282 ***	0.325 ***	0.258 **	0.271 **

Table VI : Linear regression of factors associated with quality of life

	Beta	SE	P-Value
Total IHDS	0.362	0.781	<0.05
Age	0.142	0.309	0.080
Gender	0.092	2.715	0.237
Level of Education	0.055	9.846	0.460
Work	-0.172	3.405	<0.05
Marital Status	0.018	2.813	0.817
CD4	-0.174	0.008	<0.05
Year living with HIV	0.334	1.142	0.246
Duration of consuming ARV	-0.276	1.152	0.329
BMI	0.046	0.535	0.562
Substances Used	0.044	3.430	0.590

According to the researcher analyzes the memory domain has the highest average high of 3.55 between the three domains which indicates good memory as they age. Older age physiologically started happening cognitive impairment that can be confounding. While in this study the average age of the respondents 38.09 years with a relatively young age range (26-49), the age group is physiologically not happened cognitive impairment. So that cognitive impairment was found was caused by HIV infection, in this study 60% of respondents are at the stage of AIDS and >5 years has been living with HIV, HIV-infected individuals and is heading into the final stages of AIDS are often at greater risk of severe complications neurocognitive disorders. HIV destroys the immune system and the central nervous system of individuals and attacks the cells in the brain.

Based on the results of research to indicate good psychomotor speed as the average value of 3.12 (range = 1-4) but were the lowest among the three domains. This is because HIV infects the central nervous system (CNS) carried by the monocytes in the circulation, which can migrate into the brain parenchyma into the perivascular microglia, at the time of the inflammatory process that changes the permeability of capillary blood-brain barrier. Once into the brain, the main target of the virus is parenchymal microglia, and attack the brain such as the cerebellum that functions as a regulator of the balance movement, until the muscle coordination (31). The data in this study, all respondents (100%) taking ARVs where the drug can reduce psychomotor disturbance. The results are consistent with research conducted by (26) in Baltimore, Maryland, USA

where ARV showed that consumption will improve psychomotor speed performance in patients with HIV / AIDS. Psychomotor speed is lowest could be due to a dysfunction of the dopaminergic and the predilection of HIV infection in subcortical structures.

CD4 could also be a factor of cognitive impairment, considering CD4 is the primary target of HIV infection for life. CD4 cells attacked by HIV will be broken up so that the numbers will decline and decrease when the CD4 count below 200 cells/in addition susceptible to opportunistic infections, the virus will induce injury to brain tissue and can cause cognitive impairment. These results are consistent with research Harahap (2014) in which patients who experience cognitive problems that are in the productive age group and has a value of low CD4 counts, but the need to do further research to assess the effect of CD4 against cognitive decline in people with HIV, whether the influence of CD4 singly or in combination with other risk factors.

Based on the results, the average score of overall quality of life amounted to 106.1 SD (SD = 15.3; range 67-135) which shows high scores indicate better quality of life. In measuring the quality of life is based on four domains of quality of life, these domains: physical, psychological, social and environmental. The physical domain is a domain that compares the quality of life among those who were able to perform physical activity and activity with no difficulty. These domains include daily activities, dependence on drugs, energy and fatigue, pain and discomfort, mobility, sleep or rest and working capacity of a person with HIV / AIDS. In the physical domain of research showed an average of 28.6 (SD = 4.87; range 18-40). Physical health greatly determines the quality of life.

Psychological domain is a condition of feeling and soul in him, including individual feelings against him, negative and positive feelings, spiritual, thinking skills and ability to concentrate. Psychological health greatly affects quality of life and provide a mixed reaction to individuals who measured the quality of life. In this research in getting the resultspsychological domain average of 29.6 (SD = 3.8; range 17-40).The occurrence of psychological disorders due to the factors that affect the psychological health conditions. In this study the factors that affect the psychological condition of which is the old living with HIV, where the average respondent has been living with HIV as 9.47 years. Psychological domain had the highest average value among others. According to the researcher analyzes the quality of life in the psychological domain could be affected by education in which at 80.7% had a history of past high school education, which included the high level of education resulting in quality of life scores were quite good. The level of education can affect self-management skills to cope with the disease and a variety of other issues. This

is according to research (32) on Factors Affecting the Quality of Life of PLWHA in Kupang City where HIV / AIDS patients who are highly educated 62.2% have a good quality of life.

Social relationships are an assessment of health effects related to social activities include a relationship to himself and his social, social support obtained and sexual activity. In this study, the results domain of social relationships on average 14.2 (SD = 3.04; range 6-20). Domain social relationships in the study had the lowest score among the three other domains. Results of analysis of the low life quality researcher in the social domain is influenced by educational factors, which are usually those with higher education will seek information about the disease, treatment, self-care to improve quality of life. Meanwhile, people with low education they usually immediately scared after the diagnosis of HIV/AIDS because of the stigma of society, so that without finding out they are usually close and open communication. These results are consistent with research that shows the presence of a low education level affects the quality of life of the poor (33).

An assessment of the environmental domain activity everyday activities in the home environment, outdoors and physical environment. Includes financial resources, freedom, security and physical safety, the opportunity to get new information and transportation. The average domain environment in this research is 29.6 (SD = 3.8; range 17-40). Each domain showed enough score that indicates the respondent has a sufficient quality of life. In its conclusion, sociodemographic factors that education is significantly related to the quality of life, patients with HIV/AIDS with a high level of education have a high quality of life and vice versa. The level of education can affect self-management skills to cope with the disease and a variety of other issues. Educated people have ease of access and understand the information obtained. The level of education can increase a patient's ability to do problem solving and decision making actively associated with the disease.

The results of the bivariate analysis based Pearson Correlation test showed no association between HIV-Associated Neurocognitive Disorder with quality of life, with a p-value 0.00 (α = 0.001) and the correlation coefficient of (0.373). The relationship of low value, a positive value on the correlation coefficient means that any increase in the variable HAND then the variable quality of life increases. HAND is HIV-Associated Neurocognitive Disorders. HAND can affect cognitive functions such as memory, language, attention, concentration, planning, assessment and do things difficult (12). Based on the results, more than half of respondents (50.7%) did not have cognitive impairment, and less than half of the respondents (49.3) developing cognitive impairment.

Based on the pathophysiology of HIV infects the central nervous system (CNS) carried by the monocytes in the circulation, which can migrate into the brain parenchyma into the perivascular microglia, at the time of the inflammatory process that changes the permeability of capillary blood-brain barrier. Once into the brain, the main target of the virus is parenchymal microglia (31). CNS microscopic structure consisting of neurons and neuroglia. Neurons are the basic functional unit, found in the cerebral cortex, basal ganglia, the nucleus and layers of gray brain stem and spinal cord. Neuroglia cells are cells contained backer layer of white. Including neuroglia cells: astrocytes, microglia, and oligodendroglia (34). Currently part of the nervous system of motor neurons in the brain is infected will lead to disturbances in physical activity that can affect quality of life (34).

The fact that many respondents suffer from cognitive impairments that negatively impact their quality of life is cause for concern. According to Sasson's research, which was published in the journal Neuropsychiatry, significant depressive symptoms in HIV infection are linked to selective neurocognitive deficits and low life functioning. Significant results (p.0001) were found for comorbidity when it came to cognitive impairment; people with depressive symptoms slowed down in their motor skills and memory, and people with both conditions had memory problems and a lower quality of life (24). Cognitive abilities and functional affect the quality of life of those infected with HIV, and extend previous findings related to the quality of health worse in the presence of alcoholism and HIV-komibibitas (24).

In the study Shrestha (35) The Influence of Neurocognitive Impairment, Depression, and Alcohol Use Disorders on Health-Related Quality of Life among incarcerated, HIV-Infected, Opioid Dependent Malaysian Men: A Moderated Mediation Analysis showed cognitive disorders relate negatively to the quality life (B = -, 1773, P <0.001). In the study Shrestha (35) was the first to expand the focus of cognitive impairment to quality of life, taking into account the factors of depression. Research results showed that the relationship between cognitive impairment and quality of life is mediated by depression. That is, a higher level of neuropsychological deficits associated with worse symptoms of depression, which can lead to lower quality of life.

Factors associated with quality of life can be viewed from demographic data and clinical information. The demographic data such as age, sex, education, occupation, and marital status have a relationship with quality of life. This is appropriate because the age is a variable that is always observed in the epidemiological investigation of morbidity and mortality almost all the shows with age. In 2009 UNAIDS survey results showed

the productive age group is people with HIV infection in the world. In general, a person's age affects the quality of life. This is due to changes in the physical, social and psychological (36).

Findings of this study revealed the relationship between gender and quality of life (0.032). This is according to research Fadda (37) said that men and women have differences in roles and access and control of multiple sources so that the need or things that are important to both men and women will be different. This indicates differences in other aspects of life in relation to the quality of life in men and women. In general, the welfare of men and women are not much different, but women are much more related to aspects of the relationship that is positive while high welfare in men is more related to aspects of education and better jobs.

This study showed the relationship between education and quality of life (0,282). Education is a socio-demographic factors were significantly related to the quality of life. HIV / AIDS patients with a high level of education have a high quality of life and vice versa (38). The level of education can affect self-management skills to cope with the disease and a variety of other problems. Educated people have easy to access and understand the information that was obtained (39).

Based on the results, the relationship between work and quality of life (0.010). Employment is the principal livelihood activity or something that is done to get a living. Someone who does not work or have retired have a poor quality of life in the appeal of working people (36). There is a relationship to marital status and quality of life (0.661), individuals who have not been married and divorced have a worse quality of life compared to individuals who bestatus married (36).

From the data in the old get ARV consumption correlation with quality of life (0.195). This is according to research Yuniar (2013) which shows the relationship between the old variable ARV therapy and quality of life of patients with HIV/AIDS. The use of antiretroviral drugs in HIV patients is an attempt to prolong life expectancy. ARV work against infection by slowing down the reproduction of HIV in the body. Generally, effective antiretroviral drugs used in combination, not to cure, but to prolong the life of patients with HIV/AIDS, making them healthier and more productive by reducing viremia and increasing the number of CD4 cells.

Long life with HIV also has a relationship with quality of life (0.213), according to the study where the old are infected with HIV is a factor in quality of life. Early-stage infection can cause a person to experience stress and depression. This relates to the coping mechanisms used by individuals to adapt to the stressor (40). For BMI correlation with quality of life (-0.085) in which the average patient in this study had a normal BMI that

would affect the quality of life for physical activity can take place without energy shortage (41).

Based on table 4.8 of the linear regression results obtained p-value p-value obtained IHDS (<0.05), jobs (<0.05), and CD4 (<0.05) is a predictor of quality of life force with a contribution of 25% . In this study, the value of CD4 <200cell/mm^3 There are (2%) and less than half of respondents (48) had a CD4 200-500 cell/mm^3. Based on research Handajani (2011) the results of the analysis with the four domain CD4 levels indicates the quality of lifemeaningful relationship to physical health domain (p = 0.001) and psychological domain (p = 0.043), higher CD4 level conclusions will improve the quality of life of patients. This is in accordance with the data of researchers which half of respondents (50%) had a CD4>500 cell/mm^3 with the average score of overall quality of life amounted to 106.1 SD (SD = 15.3; range 67-135) which shows high scores indicate better quality of life. The higher the quality of life will cause the patient has the ability to cope with illness.

It was concluded that the HAND/cognitive impairment can affect the quality of life of patients with HIV/AIDS but it can also be seen from CD4 factors and alcohol consumption and other factors such as depression and komordibitas. So, patients with HIV / AIDS should be able to reduce the consumption of alcohol can affect cognitive and impact on quality of life. It is an attempt to do the patient to be able to improve the quality of life for the better. In this study, a relationship in which half the respondents (50.7%) did not have cognitive impairments that affect the quality of life outcomes.

CONCLUSION

The results showed almost half of people living with HIV had cognitive impairment. There is a relationship between HIV-Associated Neurocognitive Disorder (HAND) with the quality of life. Early detection of neurocognitive impairment risk in people living with HIV need to be conducted regularly during their clinical visit. Future studies should conduct using longitudinal design to explore the dynamic change of HAND in people living with HIV. Intervention also needs to design to prevent HAND and improve their quality of life.

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