

The Effect of Gastrointestinal Symptoms to Body Mass Index (BMI) of People with HIV/AIDS in Yayasan Peduli Kelompok Dukungan Sebaya (YPKDS) Makassar, South Sulawesi 2017

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Abstract

Human Immunodeficiency Virus (HIV) results in a weakened immune system, making it vulnerable to various types of infections, systemic disorders and weight loss. In Indonesia, the incidence and mortality rates from HIV/AIDS were still relatively high, especially in Makassar, South Sulawesi Province. This study aimed to determine the dominant factors associated with nutritional status on people living with HIV/AIDS (PLWHA). This research was a quantitative research with cross-sectional design, involving 80 respondents of PLWHA aged ≥ 18 years. Data collection used a structured questionnaire included demographic, clinical, and behavioral factors, while nutritional status was measured by body mass index (BMI). The results showed that most of respondents had normal nutritional status (67.5%), followed by underweight (20%) and overweight (12.5%). Gastrointestinal symptoms were the dominant factor related to nutritional status (BMI) after controlling confounding variables such as smoking habits, food security status, and alcohol consumption (AOR = 4.78 and p-value = 0.01). Nutrition education could improve the nutrition intake and dietary behaviour of PLWHA at Kelompok Dukungan Sebaya foundation (YPKDS) in Makassar City.

Keywords: HIV/AIDS, Nutritional Status, Gastrointestinal.

Introduction

Terminating epidemical of *Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AID)* is one of the global targets of Sustainable Development Goals (SDGs) in 2030, and every country has commitment for that. HIV has affected many sectors and become a serious problem for policymakers^[1]. HIV infects human immune system cells and destroying its functions. According to *World Health Organization (WHO)*, this viral infections produce progressive damage that results in the decreased of immune system and has possibility to develop an *Acquired Immunodeficiency Syndrome (AIDS)* which is characterized by the occurrence of opportunistic infections or related

cancers^[2].

Based on the report of the Directorate General of P2PL, Ministry of Health of Indonesia, the incidence and mortality rates from HIV/AIDS in Indonesia were still relatively high^[3]. Cumulative amount reported related to HIV infections from 2005 to December 2016 (232.323 cases), the highest amount of infection was in the Jakarta Province as much as (45.335 cases), followed by East Java, Papua, West Java, and Central Java while South Sulawesi province was in the ninth position with 5445 HIV cases and 2257 AIDS cases^[2].

Nutritional status was a person's body condition as the result of nutrition intake and its utilization in the body. Providing support and attention could help PLWHA in maintaining nutritional status, immune response, managing the severity of symptoms, increasing their response to antiretroviral therapy and other medical treatments^[4].

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HIV prevalence since 2000 continued to increase and exceed 5% which meant that the level of HIV epidemic in Indonesia had entered a concentrated epidemic. Makassar City in South Sulawesi was ranked as the third ranked City with the highest number of people living with HIV/AIDS in Indonesia, after Jayapura and Jakarta^[5].

The number of HIV/AIDS patients in Makassar City was continuing to increase every year, data by Komisi Penanggulangan AIDS (KPA) Makassar showed that the cumulative number reported from 2005 to June 2015 reached up to 8085 cases consisting of 5282 HIV cases and 2803 AIDS cases. The total cases of new HIV case reported in Makassar in 2015 was 665, with 451 men 214 and women ^[5]. The objective of this study was to analyze the factors related to the nutritional status on people living with HIV/AIDS (PLWHA).

Method

This was a quantitative research using a cross-sectional design study. The main purpose of this study was to find the correlation between demographic, clinical, and behavioral factors with nutritional status in people living with HIV/AIDS (PLWHA). This research was conducted in April-June 2017. The location of this research was at the Yayasan Kelompok Dukungan Sebaya (YPKDS) as the originator of the Peer Support Group (KDS) Makassar City.

The population in this study was all of the people living with HIV/AIDS (PLWHA) registered at Yayasan Kelompok Dukungan Sebaya (YPKDS) Makassar City totaling 100 people. The sample in this study were people with HIV/AIDS (PLWHA) who were registered and actively participated in the activities of Yayasan Kelompok Dukungan Sebaya (YPKDS) Makassar and met the inclusion and exclusion criteria. The calculation of sample size using the formula of the hypothesis difference of 2 proportions obtained a minimum sample of 80. Thus the total respondents involved in this study was 80 PLWHA.

Sampling conducted with a *purposive sampling method* on PLWHA who has met the inclusion criteria. The list of names was obtained from the members list of each peer group integrated into health services (PUSKESMAS). Sources of data collected using primary

data obtained from questionnaires including Household Food Insecurity Access Scale (HFIAS) questionnaire for food security measurement, and antropometric measurement for nutritional status reflected by Body Mass Index (kg/m^2); while secondary data collected by looking at the medical records of respondents from PUSKESMAS.

The bivariate analysis was done by using the Chi-Square test with a degree of confidence of 95%. In bivariate analysis, the nutritional status was classified into two categories, underweight and not underweight (normal and overweight). While multivariate analysis was used to find out the most dominant variable affecting nutritional status on PLWHA by multiple logistic regression test.

Result

The study showed that nutritional status on people with HIV / AIDS (PLWHA) were mostly normal (67.5%), followed by underweight (20%) and overweight (12.5%). The respondents were mostly men (80%) and had the age average as 33 years. Half of the respondents graduated from high school (50%) that was classified as having high educational background. The majority of respondents were working (77.5%) and had unmarried status (48.8%).

Most of respondents underwent antiretroviral treatment (96.2%), did not experience gastrointestinal symptoms (61.2%), and did not have opportunistic infections (76.2%). Most of respondents also did not have smoking habit (55%) and did not have alcohol consumption habit (86.2%). While the food security status of the respondents showed that most of respondents had food security status (66.3%).

The results of bivariate between gender and nutritional status showed that the proportion of underweight nutritional status on men was higher (21.9%) than women. Statistically, there was no significant correlation between gender and nutritional status ($p\text{-value} > 0.05$).

Educational level variables were categorized as low and high education. The results of the bivariate analysis showed that the proportion of underweight nutritional status of er respondents with low education was higher

(21.4%) than the higher one. Statistically, there was no significant correlation between education level and nutritional status (p-value > 0.05).

The results of bivariate analysis between employment status and nutritional status showed that the proportion of underweight nutritional status of respondents who did not work was higher (22.2%) than them who had work. Statistically, there was no correlation between employment status and nutritional status (p-value > 0.05).

The results of bivariate analysis showed that the proportion of underweight nutritional status was higher

on respondents who were married (26.7%) compared with respondent who were unmarried/divorced. Statistically, there was no correlation between nutritional status and marital status (p-value < 0.05).

Clinical factors including ARV treatment and opportunistic infections did not have a significant association with nutritional status, whereas gastrointestinal symptoms were statistically correlated with underweight nutritional status with OR = 4.84. It means that the respondents with gastrointestinal symptoms had a chance of 4.8 times to be underweight compared with respondents who did not experience gastrointestinal symptoms. (Table 1)

Table 1. Bivariate analysis of factors related to nutritional status on PLWHA

Factors	Nutritional status		Total	OR (95% CI)	P value
	Underweight	Not underweight			
	%	%	n		
Age					
18 – 33	21,4	78,6	42	1,2 (0,39-9,66)	0,95
34 – 57	18,4	81,6	38		
Gender					
Male	21,09	78,1	64	1,96 (0,39-9,66)	0,625
Female	12,5	87,5	16		
Educational background					
Low education	21,4	78,6	28	1,145 (0,36-3,56)	1
High education	19,2	80,8	52		
Employment status					
Not working	22,2	77,8	18	1,19 (0,33-4,27)	0,74
Working	19,4	80,6	62		
Marital status					
Unmarried/ divorce	16	84	50	0,52 (0,17-1,58)	0,38
Married	26,7	73,3	30		
Clinical factor					
Not in ARV Treatment	0	100	3	1,26 (1,12-1,41)	0,88
In ARV treatment	20,8	79,2	77		
Gastrointestinal symptoms					
Available	35,5	64,5	31	4,84 (1,48-15,7)	0,01
Not available	10,2	89,8	49		
Opportunistic infections					
Available	26,3	73,7	19	1,62 (0,48-5,45)	0,64
Not available	18	82	61		
Smoking Habit					
Smoking	16,7	83,3	36	1,2 (0,39-9,66)	0,95
Not Smoking	22,7	77,3	44		
Alcohol consumption					
Consume	9,1	90,9	11	1,96 (0,39-9,66)	0,625
Not Consume	21,7	78,3	69		

Smoking habit and alcohol consumption statistically did not correlate with nutritional status. The proportion of underweight nutritional status was higher on the respondents who did not smoke (22.7%). While the proportion of underweight nutritional status was also mostly in respondents who did not consume alcohol (21.7%). The multivariate analysis stage showed that the variables which had a significant correlation with nutritional status were the gastrointestinal symptoms, while the smoking habit, alcohol consumption, and food security status were the confounding variables. The result of final analysis showed that the OR for gastrointestinal symptoms variable was 4.78. It means that the respondents who experienced gastrointestinal symptoms had 4.7 times chance to be underweight compared to respondents who did not experience gastrointestinal symptoms after controlling smoking habits, food security status, and alcohol consumption. (Table 2)

Table 2. The final model of multivariate analysis

No	Variabel independent	P Value	OR	(95% CI)
1	Gastrointestinal symptoms	0,01	4,78	(1,44-15,81)
2	Smoking habit	0,58	0,71	(0,20-2,42)
3	Household food security status	0,58	1,41	(0,40-5,01)
4	Alcohol consumption	0,47	0,43	(0,04-4,30)

Discussion

Human Immunodeficiency Virus (HIV) attacks human immune system and resulting in an increase possibly of other infection and lowering nutritional status. This study showed that there was no correlation between gender and nutritional status. It could be caused by the majority of respondents in this study was male. Previous research found that the proportion of underweight nutritional status was smaller in men than women [6], PLWHA who were male had three times chance to experience over nutrition [7].

Low education background in this study was found more in respondents with underweight nutritional status. This result was in line with another study which showed that underweight nutrition status was more common in PLWHA who had low levels of education [6]. The higher level of education could ideally increase someone's knowledge and attitudes in terms of choosing food.

This study did not find any correlation between nutritional status with employment status. This was not in line with another study which showed that PLWHA patients at Cipto Mangunkusumo Hospital who did not work had 1.3 times risk of experiencing malnutrition [6]. other research states that unemployed PLWHA would lead to poverty and affecting the ability of individuals to buy food [8]. People who did not work also had a 4.97 times chance to experience obesity due to having low physical activity level [9]. Among PLWHA, discrimination and negative stigma still often occur in their offices/workspaces and even the threat of job loss was still experienced by them [10, 11].

In this study, the proportion of underweight nutritional status was higher on PLWHA who were married compared to those who were single or divorced, this could be due to the increase in household members after marriage, since Makassar City community still adopting the extended family system. Households that had more than one nuclear family or consist of 2 to 3 families in one household resulting in an increased expenditure and limited food consumption. While in another study showed that PLWHA who were not married had a 2.7 chance of experiencing undernourishment when compared to PLHIV who were married, as well as PLWHA who live alone had 3 times chance to experience malnutrition than those who live with families.

This study showed that the proportion of underweight nutritional status was higher on PLWHA who underwent ARV therapy. These results were not in line with the previous study which found that PLWHA who underwent antiretroviral therapy were mostly overweight [7]. Since the introduction of antiretroviral therapy, it had indeed suppressed the occurrence of opportunistic infections among PLWHA, obesity could be caused by an improved appetite or excessive eating habits.

Treatment for antiretroviral therapy must be supported by adequate food intake [12], studies related to antiretrovirals indicate that lack of food intake could harm the pharmacokinetic effects of protease inhibitor-based drugs [13]. Another study at one of the Ethiopian hospital's ARV services showed that PLWHA who had BMI < 18.5 kg/m² when starting ARVs treatment was associated with risk of death especially in the first three months of treatment. This could occur because of the effects of immune system dysfunction due to malnutrition, and the burden of opportunistic infections being higher [14]. With antiretroviral therapy, excessive weight loss was less common in PLWHA who were taking antiretrovirals [15].

This study showed the correlation between gastrointestinal symptoms (such as nausea, vomiting, diarrhea or lack of appetite) and nutritional status. Another study also showed the association between gastrointestinal symptoms and malnutrition status [8]. HIV infection affects nutritional status by reducing food intake and absorption of nutrients due to an increased demand or utilization of protein, protein excretion and other micronutrients in the body. Other research also showed that patients with gastrointestinal symptoms such as chronic diarrhea, vomiting, and loss of appetite had been shown to significantly threaten the nutritional status of PLWHA.

The analysis found no significant correlation between nutritional status with opportunistic infections. Opportunistic infections were independent risk factors for malnutrition, weakening the immune system caused by HIV and also increasing the risk of other infections that worsen nutritional status [8]. Handling of patients with opportunistic infections immediately was very important, in the same study the occurrence of opportunistic infections was significantly related to weight loss, so the presence of antiretroviral therapy greatly helps health status and quality of life among PLWHA.

The analysis showed that there was no correlation between smoking habits and nutritional status. Smoking was a serious public health problem throughout the world and had become an epidemic that not only affected public health but also economy and environment [7]. In this study, the nutritional status of underweight was

higher on PLWHA who did not smoke, this result could be due to other factors such as opportunistic infections and gastrointestinal symptoms so that even though the respondents were not smoking, weight loss could occur. This study also did not find a correlation between alcohol consumption and nutritional status, this could be due to the small proportion of respondents who consumed alcohol.

Consuming alcohol in both infected and uninfected people could affect the immune system by altering the production of molecules that function as signals (cytokines) to coordinate the body's defenses. The result was the susceptibility of the body's defense against bacterial infections, such as pneumonia or tuberculosis. Excessive alcohol consumption was also associated with vitamin A and vitamin C deficiency [16], the level of fat in the liver will gradually increase and result in the liver had to work more than it should to deal with excess fat that was not soluble in the blood. Other effects of excessive alcohol consumption would also increase the risk of alcohol dependence, cardiovascular disease including high blood pressure, obesity, stroke, and some cancers.

Gastrointestinal symptoms were the dominant factor related to the nutritional status of people living with HIV/AIDS (PLWHA) at Yayasan Peduli Kelompok Dukungan Sebaya (YPKDS) Makassar City. Gastrointestinal symptoms (GIS) were digestive disorders such as diarrhea and lack of appetite that could cause malnutrition among people living with HIV/AIDS [16].

Conclusion

Based on the results of the study conclusions can be drawn:

1. Nutritional status of people with HIV/AIDS (PLWHA) was mostly normal (67.5%), followed by underweight (20%) and overweight (12.5%).
2. Bivariate analysis showed that *gastrointestinal* symptoms was correlated with nutritional status on PLWHA
3. Multivariate analysis showed that the dominant factor associated with underweight nutritional status was gastrointestinal symptoms with OR 4.78.

Suggestion

Suggestions that could be delivered based on the results of this study were:

1. Providing education in terms of improving and maintaining diet and nutrient intake due to gastrointestinal symptoms in PLWHA especially in Yayasan Peduli Kelompok Dukungan Sebaya (YPKDS) Makassar City.
2. For the government to pay more attention on health services for PLWHA, especially related to antiretroviral therapy treatment services.
3. For observers of HIV / AIDS and future research to deepen research related to obesity on PLWHA.

References

- [1] CARE. AIDS briefing paper : Fighting Hunger and Poverty in Communities Affected by HIV / AIDS and food insecurity : breaking the vicious. 2002.
- [2] WHO. HIV/AIDS [Internet]. WHO Press. 2016 [cited 2017 Jan 19]. p.1. Available from: <http://www.who.int/features/qa/71/en/>
- [3] Kemenkes RI - Ditjen P2PL. Statistik Kasus HIV/AIDS di Indonesia Dilapor s/d Maret 2016. 2016.
- [4] Iskandar S, Wisaksana R, Istiqomah AN, Hidayat T, Diana A. Nutritional status of HIV infected respondents in West Java, Indonesia Shelly. LPPM Univ Padjadjaran. 2013;(38):8.
- [5] Dinkes Kota Makassar. Profil Dinas Kesehatan Kota Makassar tahun 2015 [Internet]. 2015.
- [6] Reuwpassa, J, Oka., Faktor- Faktor yang Berhubungan dengan Keadaan Status Gizi Pasien HIV/AIDS Berdasarkan Indeks Massa Tubuh di RSUPN Cipto Mangunkusumo tahun 2012. FKM UI. Depok.
- [7] Mariz C de, et al. Body mass index in individuals with HIV infection and factors associated with thinness and overweight/obesity. 2011;27(10):1997–2008.
- [8] Hailemariam S, Bune GT, Ayele HT. Malnutrition : Prevalence and its associated factors in People living with HIV / AIDS , in Dilla University Referral Hospital. Arch Public Heal [Internet]. 2013;71(1):1. Available from: Archives of Public Health
- [9] Tahir, N., Thaha, A. R., & Najamuddin, U. (2014). Obesity risk factors in women even preconceptions in Makassar. *Bagian Gizi Fakultas Kesehatan Masyarakat Universitas Hasanuddin*, 2. Retrieved from http://repository.unhas.ac.id/bitstream/handle/123456789/11334/NURMAYA_TAHIR_K21110306.pdf?sequence=1
- [10] Dahlui, M., Azahar, N., Bulgiba, A., & Zaki, R. (2015). HIV/AIDS Related Stigma and Discrimination against PLWHA in Nigerian Population, 1–11. <https://doi.org/10.1371/journal.pone.0143749>
- [11] Dos Santos, M. M., Kruger, P., Mellors, S. E., Wolvaardt, G., & Ryst, E. Van Der. (2014). An exploratory survey measuring stigma and discrimination experienced by people living with HIV / AIDS in South Africa : the People Living with HIV Stigma Index. *Biomed Central Public Health*.
- [12] Anema A, Vogenthaler N, Frongillo EA, Kadiyala S, Weiser SD. Food Insecurity and HIV / AIDS : Current Knowledge , Gaps , and. *Curr Med Gr*. 2009;
- [13] Tesfamariam K, Baraki N, Kedir H. Pre-ART nutritional status and its association with mortality in adult patients enrolled on ART at Fiche hospital in North Shoa , Oromia region , Ethiopia : a retrospective cohort. *BMC Res Notes*. 2016;9–512:1–9.
- [14] Yayasan Spiritia. (2016). Laporan perkembangan HIV-AIDS di Indonesia Triwulan I (Januari-Maret) Tahun 2016. Retrieved January 14, 2017, from <http://spiritia.or.id/Stats/detailstat.php?no.8>
- [15] Weiser S, Tien PC, Hatcher A, Weiser SD, Young SL, Cohen CR, et al. Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS Article in *American Journal of Clinical Nutrition* · November 2011 between food insecurity and HIV/AIDS 1 – 4. 2011; (November).
- [16] Kemenkes. (2015). Modul 2 Informasi Dasar HIV dan AIDS. In *Modul pelatihan puskesmas peduli NHA* (pp. 5–6).