DOI: https://doi.org/10.53350/pjmhs211551309

ORIGINAL ARTICLE

Nutrition Education and Antioxidant Adequacy for People with HIV/ AIDS in Sardjito Hospital

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ABSTRACT

Background: Micronutrient is very important as an antioxidant for people with HIV/AIDS. It supports the immune system. Vitamin A, Vitamin C, and Zinc are micronutrients that work as antioxidants. People's knowledge about nutrition influences the adequacy of antioxidant sources like vitamins and minerals.

Objective: The research aims to define the correlation between nutrition education and antioxidant adequacies like zinc, vitamin A and vitamin C of people with HIV/AIDS in Sardjito Hospital.

Method: This was an observational study with a cross-sectional design. Samples were HIV/AIDS outpatients registered in Polyclinic Edelweis in Sardjito Hospital in early 2011. The number of samples was 72 respondents selected purposively. A questionnaire about a balanced diet measured nutrition education. Antioxidant adequacy consisted of Zinc, Vitamin A, and vitamin C and was calculated by Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ). Spearman correlation was used to analyze the connection between nutrition knowledge and nutrition adequacy. A focused group discussion (FGD) was used to complete nutrition knowledge and food habit in two groups (males and females) to support the data.

Result: There was no connection among sex, age, education, occupation, marital status, and opportunistic infection with vitamin A, vitamin C, and zinc adequacy (p>0,05). Only one-quarter of the total respondents had good nutrition education in a balanced diet. 62,5% of respondents were fulfilled with vitamin A, but almost 70% of the respondents did not meet vitamin C, and 86,1% had low adequacy in Zinc. Based on Spearman correlation, there was no correlation between nutrition education and antioxidant adequacy.

Conclusion: Nutrition knowledge has no relationship with antioxidant adequacy. Different individual nutrition knowledge was possibly influenced by dietary practice and nutrition adequacy.

Keywords: antioxidant, vitamin A, Vitamin C, Zinc, nutrition education

INTRODUCTION

HIV / AIDS is an infectious disease and spread quite high. *Human Immunodeficiency Virus* (HIV) is a virus that causes *Acquired Immunodeficiency Syndrome* (AIDS). This infectious disease presents a global problem. HIV is a virus that attacks the immune system and leaves its victims defenseless against opportunistic infections and disorders from which most people not affected are protected [1]. Indonesia is one of the countries in Asia with the fastest-growing epidemic of HIV/ AIDS. Indonesia's epidemic is nationally concentrated and varies greatly among regions [2]. In 2016, Indonesia had 48.000 (43.000 – 52.000) new HIV infections and 38.000 (34.000 – 43.000) AIDS-related deaths. There were 620.000 (530.000 – 730.000) people living with HIV in 2016, among whom 13% (11% - 15%) were accessing antiretroviral therapy. Among pregnant women living with HIV, 14% (12% - 16%) were accessing treatment or prophylaxis to prevent transmission of HIV to their children. An estimated 3200 (2500 - 4000) children were newly infected with HIV due to mother-to-child transmission. Since 2010, HIV infections have decreased by 22%, and AIDS-related deaths have increased by 68% [3]. One of the nutritional problems experienced by people living with HIV/AIDS is malnutrition. Malnutrition and HIV are a vicious cycle that causes health deterioration of patients into death. It means HIV infection may refer to malnutrition, including micronutrient deficiency, decreased muscle mass, food intake, mal-absorption, and increased nutritional needs [4]. HIV causes changes in nutritional status, including loss of appetite, weight loss, and malnutrition. Thus, HIV can compromise the nutritional status of infected individuals and consequently worsen diseases [5].

Micronutrient deficiency is often found in people with HIV infection because of a decreased immune response that weakens epithelial cells' integrity associated with accelerating advanced HIV infection [6]. Food intake is inadequate because it is below the RDA, especially on macro and micronutrients. Inadequate food intake is also related to socio-demographic factors. The level of formal education and low household income is a trigger factor for low nutritional intake. Diet in people with HIV / AIDS is related to specific nutrients, demographic, and clinical conditions [7]. Micronutrient needs are critical as an antioxidant in the body's defense. The minimum amount required is 100% of the recommended dietary allowance. Multivitamin supplements are needed to meet the micronutrient needs. Essential vitamins and minerals include vitamins A, C, B6, B12, folic acid, iron, selenium, and zinc. Vitamin A is needed in the regulation of epithelial cells, mucous membranes, and skin. Vitamin A is needed as antioxidants and enhance the immune system to prevent infection. Vitamin C also acts as an antioxidant and helps protein metabolism support the immune system [8].

METHOD

It was an observational method with a cross-sectional design. Respondents were people living with HIV/AIDS registered in Sardjito Hospital, Yogyakarta. On the other hand, to support data, focused group discussion was used to get some support information. The research was held for 13 months, from April 2010 to Mei 2011. All HIV/AIDS

outpatients in Yogyakarta became the target population. The samples were outpatients in Edelweis Polyclinic, Sardjito Hospital, and non-governmental organization Kebaya Kelompok Dampingan Sebaya Diadjeng and Jogja Family Support. The samples' inclusion criteria were outpatient living with HIV/AIDS aged ≥ 17 years old and willing to be respondent with proof of signing the informed consent. Exclusion criteria were outpatients moving to other areas and having severe complications like heart, kidney, type two diabetic Mellitus, and cancer diseases. If they were pregnant, they could not continue the research. The number of respondents was 72, counted on the Lemeshow formula [9]. They were selected purposively based on the researcher's consideration of the characteristic of the population that had been known. A nutrition knowledge questionnaire was used to get some information in nutrition education. It was adopted from previous research consisting of 29 questions from nutrition knowledge based on the food-based dietary questionnaire and some modifications using balanced nutrition guidelines. Knowledge was obtained from the final score based on the correct answer using a Likert scale [10]. The food frequency questionnaire was a semi-quantitative questionnaire aimed at determining food-frequency for some period (day, week, month, year) and food portion and then converted in gram. Information of vitamin A, C, and mineral zinc was obtained from calculating food intake using a nutrisurvey [11]. Next, the number of vitamins A, C, and zinc was compared with recommended daily allowance in Indonesia [12].

RESULTS AND DISCUSSION

This research was carried out at Sardjito Hospital in Edelweiss clinic. Edelweiss clinic provides services for HIV / AIDS clients, including VCT, care support, and treatment. Sardjito is one hospital that gives services to people with HIV / AIDS by decree of the Minister of Health No. 781 / Menkes / SK / VII / 2004 on establishing a referral hospital for people with AIDS / HIV. Sampling was also carried out in non-governmental organizations, such as the Diadjeng peer support group, the Jogja family, and Kebaya. There were 72 respondents from various circles or groups. Table 1 provides information about the distribution of respondents' characteristics. The table provides information that most people with HIV/AIDS are almost the same percentage as men and women. Most of the respondents aged > 40 years and came from high school education and higher. The risk factors for the occurrence of HIV are from Injecting Drug User (IDU) and couples.

Based on the data provided by the Ministry of Health in 2017 from January to March, 10376 people are infected by HIV. The highest percentage is from 25-49 years old that was 69,6%, followed by 20-24 years old (17,6%) and ≥ years (6,7%). HIV ratio between men and women was 2:1. Free sex was the most risk factor of HIV infection, between homosexual (28%), heterosexual (24%) and others (9%), and the use of a syringe (2%). On the other hand, the total HIV/AIDS infection was 11.049, with new AIDS was 673 people [13].

The level of knowledge is measured using a questionnaire. There were 29 questions. The respondents were asked to choose answers based on the asked questions' criteria of right or wrong. Table 2 summarizes the results of respondents' level of nutritional knowledge. It informed that 89% of respondents had obtained information related to balanced nutrition. Most information was obtained from health workers (79,66%), followed by media (11,86) and friends (8,47%). Respondents answered not all questions in the nutrition knowledge questionnaire. This illustrates that balanced nutrition knowledge was still low (75%). All participants had achieved information relating to AIDS, but specifically, nutritional knowledge did not know much.

Table 1. Characteristic of Respondent

characteristics	number of respondents	percentage
Sex		
Male	34	47.2
female	38	52.8
Age		
< 40 years	64	88,9
≥40 years	8	11.1
Education		
< high school	14	19,4
≥ high school	58	80.6
Occupation		
Housewife	24	33.3
Student	3	4.2
Labor	17	23.6
Employee	20	27.8
Caregiver	8	11.1
Risk Factor		
Homosexuals	7	9.7
Heterosexual	10	13.9
Partner	23	31.9
IDU	32	44.4
characteristics	number of respondents	percentage
marital status		
not married	30	41.7
married	42	58,3
other infections		
oral candidiasis	3	4.2
skin	2	2.8
TB	5	6.9
Toxoplasma	2	2.8

Tabel 2. Characteristic of nutrition knowledge and education

characteristics	frequency	%
nutritional information		
Yes	13	18.1
No	59	81.9
Source of information		
Media	7	11.86
Friends	5	8.47
Health workers	47	79.66
level of nutrition		
knowledge	54	75.0
Low	18	25.0
good		

Table 3 showed that no characters were related to micronutrient intake. Among male and female did not illustrate significant relation. However, it could be informed that the number of women consuming vitamin C, vitamin A, and zinc was lower than that of men. The lowest nutrition intake was zinc (48,61%), followed by vitamin C (41,66%) and vitamin A (22,22%).

The findings also revealed that education, occupation, marital status, and other infections were not related to micronutrient intake. Although most respondents came from high education (≥9 years), it could not describe that high education was related to adequate micronutrient intake. Others, the occupation was also not related to better intake. Most of the characteristics of respondents have meaningless values. Only age has a significant relationship with zinc mineral consumption habits. The eating habits are influenced by eating behavior.

Meanwhile, eating behavior is influenced by Predisposing factors in individuals, driving factors, and supporting factors [14]. Table 4 showed the connection between nutrition knowledge and vitamin A, vitamin C, and Zinc intake. It could be seen that getting nutritional information from other people did not relate to micronutrient intake. Also, kinds of source information did not reveal the habit of micronutrient consumption. Whereas, level of nutrition knowledge in a healthy balanced diet also did not connect with antioxidant intake.

The status and explanatory role of nutrition knowledge were uncertain. Much of this area's uncertainty was generated by conceptual confusion about the nature of knowledge and behaviors and nutrition knowledge and food behavior in particular [15]—the level of nutrition knowledge as a predisposing factor related to oneself eating habits. Someone who has good nutrition knowledge can have good habits. However, statistical analysis showed that the nutritional knowledge of a person did not associate with food intake. Eating need in people with HIV/AIDS was a priority to meet nutrition need. Food availability, easiness, and a concoction of food ingredients could improve food intake. Loss of food productivity at the individual level or family impacted nutrition availability [16]. Support in healthy nutrition knowledge individual motivation and essentiality of food and behavior should be set up.

Many factors influenced food habits. Knowledge and education could not influence food behavior without motivation. Motivation in healthy food will influence better health. Food awareness between diet and health was the first step in choosing healthy food. Generally, people will be aware that health problem is related to nutrition factors and other factors. Economic factors like price and individual income affect food choice and directly affect nutritional acquirement. Social factors like history, culture, and environment will determine food choice. Economic and change in technology became a possible reason to choose food intake. The individual had an essential subjective characteristic related to food and diet. Sometimes, an individual does not care about diet quality. It was because of other personal reasons like the taste, happiness, and food price without awareness on nutrition and knowledge [17]. There is no correlation between nutritional knowledge and food intake and food choice based on nutrition education. Knowledge and information on nutrition will give an important role in adaptation to economic conditions and food habits. Food choice is also influenced by an economic factor, physiology, psychology, social and spiritual condition. Those demographic factors influence food habits [18]. Many factors included taste, convenience, food cost, security, and cultural or religious beliefs like dietary intake. Also, factors that influenced nutrition knowledge are age, sex, education level, and socio-economic status [19]. Every person had different nutrition knowledge. Nutrition knowledge level influence attitude and behavior in food choice and affect the individual condition. Nutrition knowledge is indirectly related to food consumption. However, food consumption is influenced by purchasing power, household food-availability, consumption pattern, and family food-distribution [15].

Characteristics	vitamin A intake				p	vitamin C intake				p	Zinc intake				p
	Low		good			low		good			low		Good		
	N	%	N	%		N	%	N	%		N	%	N	%	
Sex															
Male	11	15.27	23	31.94	0.4	20	27.77	14	19.44	0.6	27	37.5	7	9.72	0.1
female	16	22.22	22	30.55		30	41.66	8	11.11		35	48.61	3	4.16	
Age															
< 40 years	24	33.33	40	55.5	1.0	46	63.88	18	25.00	0.2	57	79.16	7	9.72	0.04
≥40 years	3	4.16	5	6.94		4	5.55	4	5.55		5	6.94	3	4.16	
Education															
< high school	4	5.55	10	13.88	0.4	10	13.88	4	5.55	0.8	10	13.88	4	5.55	0.07
≥ high school	23	31.94	35	48.61		40	55.55	18	25.00		52	0.722	6	0.08	
Occupation															
Housewife	8	11.11	16	22.22	0.8	19	26.38	5	6.94	0.7	21	29.16	3	4.16	0.9
Student	2	2.77	1	1.38		1	1.38	2	2.77		3	4.16	0	0	
Labor	7	9.72	10	13.88		10	13.88	7	9.72		14	19.44	3	4.16	
Employee	6	8.33	14	19.44		14	19.44	6	8.33		16	22.22	4	5.55	
Caregiver	4	5.55	4	5.55		6	8.33	2	2.77		8	11.11	0	0	
marital status															
not married	13	18.05	17	23.61	0.3	19	26.38	11	15.27	0.3	26	36.11	4	5.55	0.9
married	14	19.44	28	38.88		31	43.05	11	15.27		36	50.00	6	8.33	
other infections															
Yes	5	6.94	7	9.72	0.7	9	12.5	3	4.16	0.6	9	12.50	3	4.16	0.2
No	22	30.55	38	52.77		41	56.94	19	26.38		53	73.61	7	9.72	

Table 4. The connection between nutrition education and micronutrient intake

	vitamin A intake		p	vitamin C intake		p	Zinc intake		p
	Low	good		low	good		Low	good	
	%	%		%	%		%	%	
Nutritional Information									
Yes	43.05	38.88	0.4	56.94	25.00	0.9	72.22	9.72	0.2
No	9.72	8.33		12.5	5.55		13.88	4.16	
Source Information									
Non-health worker	8.47	8.47	0.3	11.86	5.08	0.9	16.94	0.10	0.9
Health worker	27.1	55.93		57.62	25.42		71.8	11.86	
Level of Nutrition knowledge									
low	26.38	48.61	0.4	54.16	20.83	0.3	66.66	8.33	0.2
good	11.11	13.88		15.27	9.72		19.44	5.55	

CONCLUSION

Based on the study's findings, it could be concluded that most respondents had fair to adequate nutrition intake although they had information in nutrition knowledge. The knowledge did not affect vitamin A, vitamin C, and Zinc intake. Many factors influenced the diets of respondents. Therefore, it was recommended that education, campaign, and consultation in nutrition be emphasized by any intervention programs to improve diet quality. It was also crucial to address macronutrient intake. Interventions should find any source of micronutrients that improves and supports the immune system.

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