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Assessment of nutritional knowledge, attitude and practice among HIV infected women with art treatment in India

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Abstract
The present study was carried to assess the nutrition related knowledge, attitude and practice of women living with HIV (18-40 years) visiting the ART centre, Government Hospital, Dindigul District, Tamilnadu, India. A total of 50 HIV infected women subjects were selected by purposive sampling method. The data was collected by personal interview with the help of pretested questionnaire. The result of the study indicated that nutrition knowledge was poor as 52 percent of the subject had poor score and 44 and two percent had an average and good score respectively. Poor knowledge was also reflected with low scores for nutritional attitude and practices and the result revealed that 54 percent of subject had poor attitude and 44percent had an average attitude towards the importance of nutrition. Seventy two and 28 percent was found to have a poor and average good nutritional practice respectively. Nutrition and HIV are interrelated and nutrition plays a major role in disease progression and improves the quality of life in people living with HIV. According to this study nutrition related practices was fairly good among selected HIV infected women subjects. Thus from the study it is understood that long term nutrition education can be a best mode to improve nutritional knowledge, attitude and practice of People living with HIV (PLHIV).

Keywords: HIV infected women, N-KAP (Nutritional -Knowledge, Attitude and Practice)

1. Introduction
HIV, the virus that causes AIDS, "Acquired Immuno Deficiency Syndrome," has become one of the world's most serious health and development challenges. The first case was reported in 1981 and today approximately 36.9 million people are currently living with HIV and tens of millions of people have died of AIDS-related causes since the beginning of the epidemic (UNAIDS, 2015) [1]. NACO 2014 [2] reported that India has the third largest HIV epidemic in the world with 2.1 million people living with HIV and an estimated 1,30,000 people died from AIDS -related illness. Over the past three decades, in some regions young women and adolescent girls have remained at a much higher risk of HIV infection than their male peers. Inadequate food intake, increased requirements and malabsorption are the main reasons for weight loss in PLHIV. Human Immuno Deficiency Virus (HIV) and Acquired Immune Deficiency Syndrome have also created nutritional, clinical, social and economic problems nation-wide. Nutritional supplement and drug therapy with great soothing and controlling effect could act as an adjunct intervention remedy in ensuring the health of people living with HIV/AIDS (Chitra and Booma 2014) [3]. According to World Health Organization (2003) [4], individuals infected with HIV have special nutritional needs particularly increased energy and protein requirements irrespective of whether they use ART or not. Symptomatic PLHIVs require an increase in their energy intake by 20 – 30% than non-HIV infected persons. They should as well meet the protein and micro nutrient intake levels recommended for healthy individuals. Proper nutrition helps to strengthen the immune system, reduce opportunistic infections, optimize response to medical treatment and slow the disease progression.
Nutritional alterations, such as weight loss and protein depletion are common in HIV infection, ultimately leading to malnutrition. On the other hand, poor nutrition results in weak immune system and, thus predisposes an individual to opportunistic infections and enhanced progression of HIV to AIDS (Semba and Tang 1999) [5]. Fauzie *et al.,* (2004) [6] reported that nutrition plays a crucial role throughout the course of HIV disease. Once infected, malnutrition and HIV work in tandem, creating classic 'vicious cycle' where each condition degenerate the other. This deadly tandem, threatens the nutrition security of HIV positive individuals. People living with HIV need to possess nutritional knowledge than the people who are not HIV infected.
Knowledge means the ability of pursuing and using information, and by understanding, learning experience and identifying the studying technologies. Attitude indicates the result of making reaction via some ways in some situations, and observes and explains based on the result of reaction or combine into one point of view. Practice indicates working together of knowledge and habit (lbrahim, 1995) [7] Mini *et al.,* (2010) [8] found a significant ($p< 0.01$) improvement in knowledge attitude and practice of what after the educational sessions to HIV infected patients. Ehndrie, Cox and Coveney, (2008) [9] found that nutrition knowledge is a significant predictor of dietary intakes, and that it is needed for better dietary intake habits. So the present study was undertaken to assess the nutrition related knowledge, attitude and practice of HIV infected women.

2. Material and methods
2.1 Selection of the sample
The study was conducted at ART centre of Dindigul Government Hospital, Tamilnadu, India. A total of 50 HIV infected women subjects (18-40 years) were selected by purposive sampling method for the study. The inclusion criteria for selection of the subjects were taking ART treatment

from the centre in the study area, aged between 18-40 years, a symptomatic clinical stage of HIV infection, non-pregnant, non-lactating women willingness to participate in the study. The study was approved by the hospital management. Written consent from all the subjects was received after explaining the purpose of the study and the information's were kept confidential.

2.2 Collection of data

The data was collected by personal interview with the help of pre tested questionnaire. The nutritional KAP questionnaire consisted of three parts namely Knowledge, Attitude and Practice. The first part of questions was for testing the knowledge on nutrition, 2nd and 3rd to test the attitude and practice related to nutrition.

2.3 Nutritional knowledge, attitude and practice

2.3.1 Nutritional knowledge

Nutritional knowledge and attitude are important factors of dietary practices and its, potential targets for appropriate planning of nutrition care programmes for vulnerable people living with HIV and AIDS (Sakhile *et al.,* 2014) [10]. The first part included 15 questions, each with four options, out of which one was correct. Each question had only one correct answer and score of one was given to every correct answer and zero to every wrong answer. The respondent can score minimum 0 to a maximum of 15 scores. A total of 15 questions on various aspects of nutrition such as nutrients and their sources and requirements as per RDA, foods that help to improve immunity and inturn CD_4 counts, sources of safe drinking water methods used for leftover utilization, side effects of ART and its relation to malnutrition and foods to be avoided by an HIV infected individuals were included.

2.3.2 Nutritional attitude

Questions included in attitude section were designed and beliefs among the subjects regarding the attitude on nutrition. There were 15 questions provided and the respondents were asked to indicate their attitudes. These statements covered overall nutritional attitudes. In the attitude section, numerical values were assigned to each choice given by the respondent. A score of 1 was given to disagree, score of 2 was given to don't know and a score of 3 was given to agree. There were seven negatively framed statement for which reverse scoring was done that is score of 1 was given to agree, 2 to don't know and 3 to disagree (Q3,Q4,Q8,Q9,Q10,Q11,Q13). In this scoring system each respondent can score a maximum of 45 and minimum of 15 score for the questions in this section.

The questions included were related to attitude about HIV infected persons, consumption pattern of beef and pork, role of immune enhancing foods, relationship between dietary intake and progression of malnutrition, irregular meals, ART treatment, physical activity, metabolism and dietary guidelines followed for diarrhoea and fever, nutritional attitudes about locally/ seasonally available foods, low cost supplementary food and preparation and importance of diet counselling for PLHIV.

2.3.3 Nutritional practices

Question included in the practice section were designed to assess the dietary practice of the population with regard to HIV infection. There were 15 close ended questions with answer as yes or no. Yes indicated she had better dietary practices while no indicate she was false one in positive question. In this section each yes response received a score of 1 while each 'no' received a score of 0. There were two negatively framed statement for which reverse scoring was done that is score of 1 was given to no and 0 was given to yes (Q1 and Q14). Therefore a respondent can score maximum up to 15 and minimum 0 scores in this section. Gambian women by Mwangome *et al.,* (2010) [11] observed nutritional knowledge may not obviously translate into nutritional practices; hence, there is need to consider the broader social, cultural and economic factors.

This section consisted of questions on nutrition related practices such as dietary practices followed cooking, consumption pattern of millets, green leafy vegetables and supplementary food, water consumption/day, regular dietary practices and inclusion of seasonally available fruits and vegetables. Regular habit of performing physical activity, recording of body weight every month, antiviral home remedies and maintaining kitchen garden, other lifestyle habits to be avoided while on ART treatment, foods to be avoided, importance of nutritious food in ART treatment and community participation related to creating awareness about healthy food to this group of people.

2.3.4 Classification of Scoring and total KAP

Knowledge, attitude and practice scores were classified as poor, average and good. On summing up the scores of the individual sections the final KAP score ranged from 15 to 75. Higher the score represent the good nutrition related knowledge; attitude and practice of the HIV infected women. The score were also classified according to the sample as poor, average and good according to the score range used as shown in Table 1.

2.4 Statistical Analysis

Data were coded, entered and analyzed for percentage using SPSS version 21. Data were presented as percentage, minimum level, maximum level and mean ± standard deviation (SD). The correlation between nutritional KAP and other variables (socioeconomic and BMI) was assessed by the pearson's analysis. The significance level considered was set at $p<0.05$.

Table 1: Scoring and classification of nutritional KAP

	Knowledge	Attitude	Practices	KAP
Scoring	1 for correct answer 0 for incorrect answer	Positive questions 1=disagree, 2=don't know, 3= agree	Positive questions 1=yes, 0= no	Knowledge score + attitude score + practice score
		Negative questions 1= agree, 2= don't know, 3=disagree	Negative questions 1=no, 0= yes	
Range	0-15	15-45	0-15	15-75
Classification	Poor: 0-5	Poor: 15-25	Poor: 0-5	Poor: 15-35
	Average: 6-10	Average:26-35	Average: 6-10	Average: 36-55
	Good: 11-15	Good: 36-45	Good: 11-15	Good: 56-75

3. Results and discussion

3.1 Nutritional Knowledge

The investigation was carried out to assess the nutritional knowledge, attitude and practice of HIV infected women in India. Data related to nutrition knowledge has been given in Table 2. From the collected data of the present study it was clear that majority of the selected subjects had poor knowledge on nutrition. Sixty percent of the subjects had knowledge on foods that are excellent source of protein and twenty six percent knew the foods that had high biological value protein. Whereas 56 and 76 percent of the subjects had knowledge on quantity of water to be consumed per day and source of safe drinking water respectively. Only 6 and 16 percent were found to have knowledge on RDA and function of fluid in the body. Forty eight and twenty percent of the subjects had knowledge on type of diet that helps to maintain a healthy body and side effects of ART in relation to malnutrition. According to Seda Abgaryan (2015) [12] the respondents' of his study had a mean nutrition knowledge score of 14.44 (SD=1.56). The minimum score achieved was six and the maximum score achieved was nineteen. The mean percent knowledge score was 68.76 percent. The mean attitude score of participants was 17.8 (from lowest 12 to highest 21, SD=1.56) out of maximum 25. The mean percent attitude score was 71.2 percent.

Table 2: Distribution of nutrition knowledge related responses of HIV infected women in India

Responses	N=50*	Percentage (%)
Excellent source of protein	30	60.0
Food with high biological value	13	26
Number of glasses of water to consume per day	28	56.0
Source for drinking water	38	76.0
Functions of fluid in the body	8	16.0
The required recommended Dietary Allowances required	3	6.0
The diet that help you to maintain body weigh	24	48.0
side effects of ART in relation to malnutrition	12	24.0
Causative factors of anaemia	29	58.0
Function of vitamin C	13	26.0
Foods that does not increase the immunity of PLHIV	28	56.0
Functional food components in Flaxseed	2	4.0
Foods that help to increase the CD4 cell count	14	28.0
leftover foods should be used	2	4.0
Individual infected with HIV should be avoided	33	66.0

***** Number of subjects with correct answers

Fifty eight, 56 and 66 percent of subjects knew the causative factors of anaemia, foods that increase the immunity and need to avoid habits like tobacco, alcohol by the individuals infected with HIV respectively. Twenty six, four, 28 and four percent of subjects had knowledge on functions of vitamin C, functional components of flaxseed, foods that increase CD4 cell count and to consume left over foods only on reheating or reprocessing.

3.2 Nutritional Attitude

Three pointer scale (agree, disagree and don't know) was used to assess the response of the nutritional attitude related questions and the results are shown in Table 3. The overall attitude score ranged between15 to 45. Fifty six percent of the subjects believe HIV virus infects both healthy and unhealthy persons. Thirty percent of the subjects reported to agree for the statement improper dietary intake will progress to malnutrition and 30 and 64 percent of the subjects had negative attitude on consumption of beef and pork and faulty dietary guidelines on suffering from fever respectively and 72% believed fasting helps to decrease the virus load.

Less than 10% of subjects reported immune enhancing food helps to increase the CD 4 cell count, value added foods enhance the nutritive value of the food and 12% of subjects agreed that exercise helps to increase the digestion and absorption and 16% of subjects agreed that they were encouraged to take electrolytes during diarrhoea. John Bukusuba *et al*., (2010) [13] found that most participants understood that consumption of a balanced diet (99.3%), fruits and vegetables (99.3%) and special diets (63.1%) is necessary for good health. Fifty percent of subjects agreed skipping meals would increase the side effects of ART treatment and 24% of subjects accepted diet counselling was important in their life and it will help to improve the nutritional status. Eighty four and 76 percent had negative attitude about locally/ seasonally available foods and their nutritive value respectively where as 56% of subjects reported meeting with the diet counsellors for HIV infected individuals is not necessary and 94% of subjects had wrong attitude on preparation of supplementary food at home.

Table 3: Distribution of nutrition Attitude related responses of HIV infected women in India

Responses	Agree		Disagree		Don't know	
	N =50*	%	N=50*	%	N=50*	%
Attitude about HIV infected persons	29	58.0	16	32.0	5	10.0
Improper dietary intake related malnutrition	15	30.0	22	44.0	13	26.0
Consumption of beef and pork	30	60.0	11	22.0	9	18.0
Tea and bread only consume on fever	32	64.0	11	22.0	7	14.0
consumption of electrolytes during diarrhoea	8	16.0	19	38.0	23	46.0
Consumption of immune enhancing foods helps to increase the CD4 cell count	3	6.0	24	48.0	23	46.0

Skipping meals increase the side effects of ART medicines	25	50.0	17	34.0	8	16.0
Fasting helps to decrease the HIV virus load	36	72.0	6	12.0	8	16.0
Locally available/ seasonally available foods are not nutritious	42	84.0	4	8.0	4	8.0
Expensive supplementary foods are only nutritious	38	76.0	5	10.0	7	17.0
Possible to prepare healthy supplementary food at home	47	94.0	1	2.0	2	4.0
Value added foods enhance the nutritive value of the product	2	4.0	29	58.0	19	38.0
Meeting with the diet counsellors for a HIV person is not necessary	28	56.0	9	18.0	13	26.0
Nutrition counselling helps to improve the health status of PLHIV	12	24.0	28	56.0	10	20.0
Exercise play an important role in metabolism	12	24.0	29	58.0	9	18.0

***** Number of subjects with correct answers

3.3 Nutritional Practices

Table 4 describes the nutrition related practices and it reveals that all the subjects used to overcook vegetables and none of the subjects included millets and green leafy vegetables in their daily menu and 20% of subjects stated that they had a habit of chewing tobacco. Seventy six, 100 and 48 percent of subjects had the practice of drinking more than eight glasses of water per day, recorded their body weight every month because they were taking regular treatment in ART centre and consumed seasonally available foods in their diet. Less than 25% of subjects reported they had the practice of consuming nutritious foods to reduce the side effects of ART treatment, they used supplementary food, prepared supplementary foods in their home and preparation of antiviral home remedies and 30% of subjects had practice of consuming snacks/ fruits in between their main meals.

Table 4: Distribution of nutrition practice related responses of HIV infected women in India

Responses	N= 50*	Percentage (%)
Over cooked vegetables are highly nutritious	50	100
Consumption of millet based foods in daily menu	-	-
Green leafy vegetables in your daily diet	-	-
8 glasses of water to drink per day	38	76.0
Consumption of fruits and snacks	15.0	30.0
Maintain a record for weight	50.0	100.0
Consumption of nutritive foods reduce the side effects of ART treatment	11.0	22.0
Consumption of seasonally available foods	24.0	48.0
Regular use of supplementary food	6.0	12.0
Preparation of homemade supplementary food	6	12.0
Anti-viral home remedies	1	2.0
maintaining kitchen garden in home	4	8.0
Habit of physical activity in every day	13	26.0
Habit of consuming tobacco	10	20.0
Create awareness on healthy food	10	20.0

***** Number of subjects with correct answers

Level of education, personal beliefs, availability of food, and low nutritional knowledge were the reason for poor dietary practices (Bukusuba *et al*., 2010) [13]. Only 24 percent had the habit of doing physical exercise daily and 20% of subjects had the practice of creating awareness on healthy food and food safety to neighbours and a measure of less than eight percent of them maintaining kitchen garden.

3.4 Classification of scoring and total KAP

As per the findings of our study, the observations made in the present study conform that nutrition knowledge, attitude and practices are interrelated. Deepika Anand and Seema Puri (2013) [14] stated that in India, little is known about the level of nutrition related knowledge, attitude and the common nutritional practices that are prevalent among PLHIV. Table 5 shows that fifty two percent of the respondent had poor knowledge followed by 44 percent and two percent of subjects with average and good knowledge about nutrition. Forty four percent had poor attitude, 44 % had average and only one percent had good nutrition related attitudes. Thirty six and 28% percent of women had poor and average practices and mean ± SD values. However from our study it is observed that nutrition knowledge was obviously translated to nutritional attitude and practices.

Table 5: Summary of classified score of Knowledge, Attitude and Practice and total KAP of selected respondents

Sections	Poor	Average	Good
	N (%) Mean ±SD	N (%) Mean ±SD	N (%) Mean ±SD
Knowledge	26 (52.0) 3.38±1.2	22 (44.0) 7.59±1.18	2 (4.0) 11.0±0.00
Attitude	27 (54.0) 20.04±3.20	32 (44.0) 29.05±2.71	1 (2.0) 36.0±0.00
Practice	36 (72.0) 3.50±1.15	14(28.0) 6.57±1.0	0 (0.0) 0.00±0.00
Total KAP score	26 (52) 26.58±4.42	23 (46) 41.91±4.55	1 (2.0) 56.00±0.00

The minimum and maximum level of scores of KAP is represented in Table 6 along with the mean score for KAP. The minimum score of 1 to maximum score of 11 and minimum score of 1 to maximum score of 10 in knowledge and practice section and minimum score of 15 to maximum score of 36 in attitude section of total respondents. The mean scores obtained for knowledge, attitude and practice is as follows 5.54± 2.64, 24.32± 5.61 and 4.36±1.79 respectively. A study similar to ours by Sakhile *et al.* (2014) [10] also found that respondents

had minimum score of 1 to maximum score of 11 and minimum score of 6 to maximum score of 35 in knowledge and practice and 12 – 36 scores in attitude section.

Table 6: Minimum and maximum score of total nutritional Knowledge, Attitude and Practice scores obtained by respondents

Sections	Total score	Minimum Score	Maximum Score	Mean ± SD
Knowledge	277	1	11	5.54 ± 2.64
Attitude	1216	15	36	24.32 ± 5.61
Practice	218	1	10	4.36 ± 1.79

3.5 Correlation between nutritional KAP and other variables

Bivariate analysis showed that the level of attitude (p=0.836) practice (p=0.703), education (P=0.625) and BMI (p=0.320) were significantly associated with nutrition knowledge. Nutritional practice (p=0.720) and education (p=0.719) were significantly associated with nutritional attitude and educational status of the respondents (p=0.568). A negative correlation was observed between the ages with nutritional KAP, age with education, income, number of children, income and BMI and the data is presented in Table 7. Seda Abgaryan (2015) [12] conducted a study assessed nutritional KAP of people living with HIV in Armenia and reported that the correspondence of the study had good nutrition of knowledge and positive attitude, but inappropriate level of consumption of certain food groups among the study population. The nutritional practice in this study was shown to be significantly associated with attitude towards healthy nutrition and another study conducted among trained women living with HIV in Eastern Uganda, to assess the gaps in nutritional knowledge, attitudes and dietary practices, reported that only ―51.9% of the people interviewed understood the meaning of good nutrition and 45.1% knew about increasing the frequency of meals and 78.2% had consumed <3 meals in the proceeding 24 hours (Bukusuba *et al.* 2010) [13].

Table 7: Pearson's correlation between nutritional KAP and socioeconomic and BMI variables in women living with HIV in India.

	Knowledge	Attitude	Practice	Age	Education	Income	Number of children	BMI
knowledge	1							
Attitude	0.836**	1						
practice	0.703**	0.720**	1					
Age	-0.136	-0.133	-0.137	1				
Education	0.625**	0.719**	0.568**	-0.239	1			
Income	0.191	0.241	0.227	-0.207	0.205	1		
Number of children	0.019	0.003	-0.030	-0.013	-0.210	0.264	1	
BMI	0.320*	0.216	0.129	0.113	0.075	-0.129	-0.111	1

** Correlation is significant at the 0.01 level *Correlation is significant at the 0.05 level

4. Conclusion

The study found that low level of nutrition related knowledge, attitude and practices. Larger scale investigation should be conducted to explore the nutrition related barriers in their life and continuous nutrition education programme will help to maintain sound health and the delay the onset of AIDS or any other opportunistic infections in PLHIV.

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