



Fruit and Vegetable Consumption and Associated Factors among Women of Reproductive Age Attending Maternal and Child Health Department in Public Hospitals in Addis Ababa, Ethiopia, 2021

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Abstract

Background: Low fruit and vegetable intake is the main contributor of micronutrient deficiencies in the developing world. World health organization recommends minimum amounts of 400g (five servings per person per day) of fruit and vegetable per person per a day for the prevention of chronic diseases as well as for the prevention of micronutrient deficiencies. WHO estimates that low fruit and vegetable intake contributes to approximately 2.7million deaths per year from non-communicable diseases such as cardio vascular diseases, diabetic mellitus and stroke.

Objective: The main objective of this study was to assess fruit and vegetable consumption and associated factors among women of reproductive age attending maternal and child health department in public hospitals in Addis Ababa, Ethiopia.

Methods: A cross sectional study design was used in public hospitals in Addis Ababa from 25th May to 1st July, 2021. A total of 422 women in reproductive age were participated in the study and data was collected by using pretested interviewer administered questionnaire. A simple random was applied to select 3 public hospitals found in Addis Ababa. Data were entered in to EPI info software and exported to SPSS for further analysis. A descriptive data analysis was conducted to summarize the information on fruit and vegetable consumption. A logistic regression model was carried out to identify associated factors of fruit and/or vegetable consumption. Statistical significant were declared at p-value less than 0.05.

Result: The study revealed that only 6.8% of the women consumed recommended amounts (≥ 5 servings per day) of fruit and/or vegetable. Being unemployed (AOR=2.66, 95% CI: 1.054, 6.72), being single (AOR= 0.57, 95% CI: 0.23, 0.14) and presence communication between wife and husband (AOR=0.16, 95% CI: 0.06, 0.43), were factors associated with women adequate fruit and vegetable consumption in Addis Ababa.

Conclusion and Recommendation: In this study adequate fruit and vegetable consumption by women is low. Women's occupation, marital status and having communication between their husbands about F&V were strong predictors of adequate fruit and/or vegetable consumption. Hence we recommended health promotion interventions to scale up fruit and vegetable should pay attention to factors identified in this study.

Keywords: Fruit; Vegetable; Women; Associated factors; Ababa Ethiopia. Ethiopia.

Background

Low fruit and vegetable intake is the main contributor of micronutrient deficiencies in the developing world especially in population with low intake of animal protein foods such as meat and dairy products. Adequate consumption Fruit and vegetable are an important part of a healthy diet can prevent all forms of malnutrition (under nutrition, micronutrient deficiency, overweight and obesity) and reduce the risk of non-communicable diseases[1]. Together with malnutrition, unhealthy diets are among the top-ten risk factors for disease globally[2].

There is substantial evidence to support the benefits of adequate fruit and vegetable consumption[3]. Fruit and vegetables are important to promote good health, strengthen immune system and protect against diseases now and future by cutting intergenerational cycle of malnutrition because they contain many vitamins, minerals, fiber and other components which, as well as contributing to overall good health, are beneficial in the protection against cardiovascular disease and certain cancers and can result in improved gastrointestinal health and vision[3,4].

The increased consumption of fruit and vegetables, an excellent source of vitamin C during pregnancy has been shown to be positively associated with birth weight. In contrast, inadequate dietary intake of vitamin C may result in adverse outcomes, such as low birth weight (below 5% standard birth weight for gestational age) and preterm delivery (birth that occurs before the 37th week of pregnancy)[5]. Fruit and vegetable consumption contributes to ensuring the nutritional adequacy of food consumed. Nutritional adequacy of food is one of the components that need to be fulfilled for the realization of the

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human right to adequate food, thus leading to the achievement of food and nutrition security. Adequate fruit and vegetable consumption contributes to an optimal nutritional status and improved nutritional status can contribute to reduced morbidity and mortality[3,6].

Majority of countries make dietary recommendations that include fruit and vegetables. The recommendations vary from country to country, depending on what is locally available, affordable, and socio culturally acceptable [7]. World health organization recommends minimum amounts of 400g of fruit and vegetable per person per a day/ five servings per person per day/ for the prevention of chronic diseases as well as for the prevention and alleviation of several micronutrient deficiencies[8,9]. Adequate amount is defined as being at least 400g per day which is considered to be equivalent to five servings of 80g of fruit and vegetable which is internationally recognized standard serving size which is the intake of minimum of 400g of fruit and vegetable per person per day excluding potatoes and other starchy tubers [10].

Worldwide, women in reproductive age consume far less fruit and vegetables than the minimum total of 400 g recommended by WHO for a healthy diet in both developed and developing countries[11]. On average, women consume only about two-thirds of the recommended minimum amounts of fruit and vegetables. People in Central Asia, North Africa and the Middle East consume slightly more than the recommended minimum, while those in sub-Saharan Africa and Oceania consume only about one third [12].

In Ethiopia, consumption of fresh fruits is approximately 7 kg/ person/year which is far below the WHO and FAO recommended minimum level of dietary intake (146kg/person/year) [4]. and majority of women in reproductive age consume monotonous plant based diet that may be inadequate to provide adequate nutrition [13]. Hence, this study was aimed to assess fruit and /or vegetable consumption and associated factors among women of reproductive age attending public hospitals in Addis Ababa.

Methods

Study design, study area & period

Institutional based cross sectional study design was conducted to assess fruit and vegetable consumption and associated factors among women of reproductive age in Addis Ababa public hospitals from 25th May to 1st July, 2021. In Addis Ababa city administration, there are 11 Sub-cities, 118 and 13 public hospitals, 22 private hospitals as well as 96 health centers in Addis Ababa city administration [28].

Study participants

Women in reproductive age attending public hospitals in Addis Ababa and willing to participate in the study were included and women who were critically sick to participate in the study were excluded.

Sample size determination

The sample size was determined by using single population proportion formula.

Where, sample size derived from estimation formula

n =sample size

$Z_{\alpha/2}$ = the value of z at confidence level of 95%= 1.96

P =50% i.e. no similar study performed in study area previously.

The formula for single for single population proportion is:

$$n_o = \frac{z_{\alpha/2}^2 P(1 - P)}{d^2}$$

Where,

n_o = initial sample size

$Z_{\alpha/2}$ = confidence Level

P = proportion

D = width or margin of error

Hence,

$$n_o = \frac{1.96^2 0.5(1-0.5)}{(0.05)^2} = 384$$

Adding 10% for non-respondents, $384 * 10\% + 384 = 422$

Therefore, sample size for the study was 422.

Sampling technique

Simple random sampling (lottery method) was used to select 3 public hospitals which cover 30% of the total public hospitals found in Addis Ababa. Then, in these selected hospitals, the number of study participants was assigned proportionally based number of women attending each of those hospitals. Finally, the required number of women was selected by using systematic random sampling.

Sampling procedure

Tirunesh Beijing general hospital, Gandhi hospital and Zewuditu hospital are included in the study. The study participants for each hospital allocated proportionally after identifying the three months reproductive women attending at each hospitals as shown in Figure 1. The study participants were selected by systematic random sampling method. The sample size was divided for each of selected hospitals were allocated proportionally to the size of women of reproductive age based on previous three months average daily client flow of maternal and child care service. The first respondent from each selected hospitals were selected randomly. The subsequent interval was calculated by dividing the monthly attendance at each hospital to calculated sample size. The subsequent respondents were selected every k th where N/n (N is total population and n is sample size) until the required numbers of samples was met.

Data collection tools

Pre tested interviewer administered questionnaire was used. The questionnaires was prepared in English and translated into Amharic and again translated to English. Comparison was made on the consistency of the two versions. The questionnaire was prepared by reviewing literatures of similar studies and WHO STEPS wise approach(21,29). Data was collected by trained health professionals and under the direct supervision of the principal investigator.

Data collection procedures

After getting clearance approval from ethical review committee, I asked permission from selected hospital to conduct research.

Women of reproductive age were selected by using simple random sampling method. All selected of women of reproductive age were included in the study. Fruit and vegetable consumption and associated factors among women in reproductive age attending MCH was assessed by using pre tested interviewer administered questionnaire.

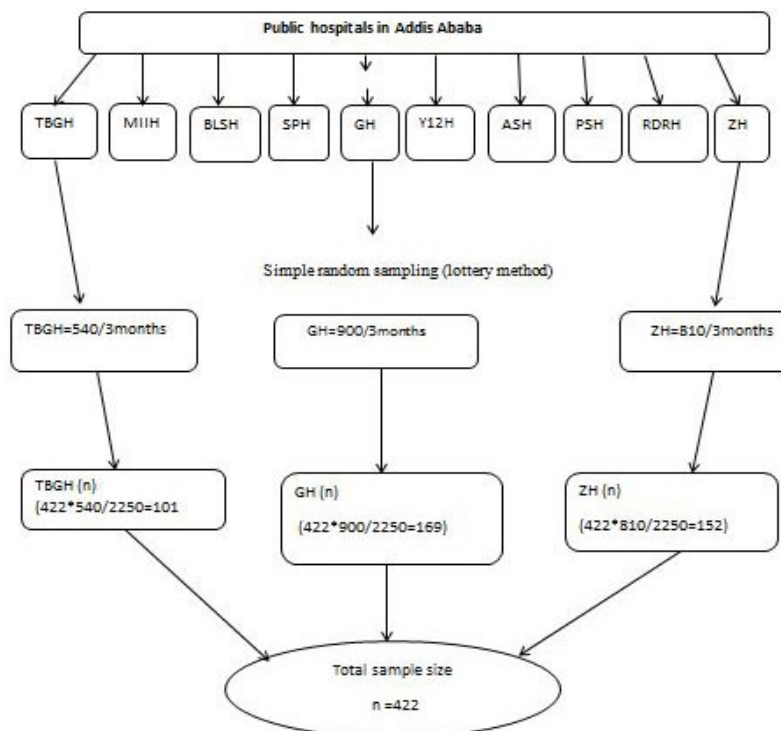


Figure 1: The schematic presentation of sampling procedure to select study participants from Public hospitals in Addis Ababa 2021.

Operational definition

≥5 Servings: - intake of five and above servings of fruit and/or vegetable per day. Adequate intake of fruit and vegetable by WHO.

<5 Servings: - intake of less than five servings of fruit and/or vegetable per day, which is less than (inadequate) by WHO recommendation (i.e. zero serving, 1- 2 servings, 3-4 servings) Figure 2.

Data quality management

Pre-test was done out of the sampling hospitals. Necessary information and correction were made on the clarity of language workability of the questionnaire. The questionnaire was modified based on pre-test findings. Training was provided for data collectors on the questionnaire about fruit and vegetable consumption. Supervisor made close supportive supervision throughout the data collection period [22].

Data processing and analysis

Completed questionnaire were checked for completeness and coded, data were entered in to Epi data version 4.6 and exported to Statistical Package for Social Science(SPSS) version 20 for data processing and analysis. Data were edited and cleaned using frequencies and cross tabulations. Description of means, frequencies and proportions of the given data for each variable was calculated. Results from bivariate analysis of p-value< 0.25 were entered into multivariable logistic regression model to control the effects of confounders. A variable with the P-value <0.05 at 95% confidence interval was considered as statistically significant. Crude and adjusted odds ratios with their 95% confidence intervals were calculated. Finally, the results of the study were presented using tables, figures and text based on the obtained data [23].

Fruit and/or vegetable consumption per day

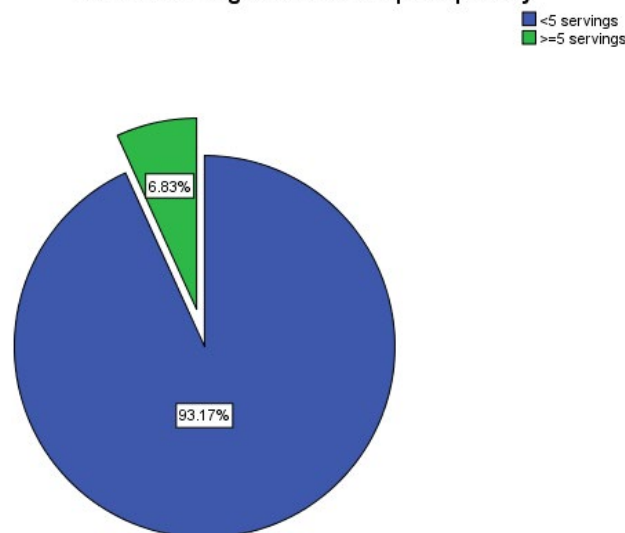


Figure 2: Fruit and/or Vegetable Intakes by respondents by number of servings per day, Addis Ababa, 2021.

Operational definition

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Results

Socio demographic characteristics of the study population

In this study, a total of 422 of women were involved in the study and complete information was obtained from 410 which gave a response rate of 97% [24]. The mean (\pm SD) of the respondents age was 27.64 \pm 5.64 years and majority 251 (56.3%) of them were between 15 and 25 years of age. Majority, 364(88.8%) of the study participants were married and 46 (11.2%) of them were single. About 308(75%) participants were unemployed and 102[25] were employed. About 114 [27] of the respondents attended primary education, 67(16.3%), 104(25.4%) were diploma, 40(9.7%) were degree/above and 85(20.75%) had no formal education Table 1.

Women's fruit and/or vegetable consumption

Mean (\pm SD) intake of women's fruits and/or vegetable consumption was 1.7 (\pm 0.253) servings /day.

Among 410 respondents only 28 (6.8%) of respondents consumed five and above of fruit and/or vegetable. Similarly, a higher percentage, 382(93.2%) of respondents consumed less than 5 servings of fruit and/or vegetable in a typical days of the week.

About 353(86%) married women were consumed < 5 servings of fruits and/ or vegetable in a day in a typical week and 29(7%) single women consumed < 5 servings in a day in a typical week. More than half of women who were unmarried 17(4%) consumed \geq 5 servings of fruits and/ or vegetables a day in a typical week Table 2.

Factors affecting fruit and vegetable consumption of women

The association of dependent and independent variables were explored by both bivariate and multivariate logistic regression. Variables which show statically significant association at $P \leq 0.25$) in bivariate logistic regression were entered to multivariable logistic regression to rule out confounders.

The bivariate logistic regression analysis showed eeducational level of respondent, employment status, marital status, having or not having children, number of children, educational level of husband and communication about intake of F&V with husband were the factors associated with fruit and vegetable consumption of women.

Then, in the multivariable logistic regression analysis, some variables such employment status, marital status and communication about intake of fruit and vegetable with their husband were factors

Table 1: Socio-demographic characteristic of study participants, Addis Ababa, 2021 (n=410).

| Variable | Category | Number (n) | Percent (%) |
|-------------------|----------------------------|------------|-------------|
| Age Group (Years) | 15-25 | 161 | 39.3 |
| | 26-35 | 231 | 56.3 |
| | 36-45 | 18 | 4.4 |
| Marital Status | Married | 364 | 88.8 |
| | Single | 46 | 11.2 |
| Educational level | Degree and above | 40 | 10 |
| | Diploma | 104 | 25 |
| | Secondary education (9-12) | 67 | 16 |
| | Primary education (1-8) | 114 | 28 |
| | No formal education | 85 | 21 |
| Employment status | Unemployed | 308 | 75 |
| | Employed | 102 | 25 |

Table 2: Distribution of number of servings of fruits and/ or vegetables eaten per day in a typical week, by characteristics of participants, 2021(n=410).

| Variable | Category | (Less than 5 servings), n (%) | 5 and above servings, n (%) |
|--------------------|---------------------|-------------------------------|-----------------------------|
| Age Group | 15- 25years | 150(36.6) | 11(2.6%) |
| | 26-35years | 215(52.4%) | 16(3.9%) |
| | 36-45years | 17(4%) | 1(0.2%) |
| Level of Education | No formal education | 80(19.5%) | 5(1.2) |
| | Primary education | 109(26.6%) | 5(1.2%) |
| | Secondary school | 62(15) | 5(1.2%) |
| | Diploma | 99(24%) | 5(1.2%) |
| | Degree and above | 32(7.8%) | 8(1.9%) |
| Employment status | Employed | 89 (21.7%) | 13(3.2%) |
| | Unemployed | 293(71.5%) | 15(3.7%) |
| Marital Status | Single | 29(7%) | 17(4.2%) |
| | Married | 353(86%) | 11(2.7%) |
| Number of children | Zero | 95(23.2%) | 13(3.2%) |
| | 1-2 children | 155(37.8) | 7(1.7%) |
| | 3-4 children | 84(20.5) | 7(1.7%) |
| | \geq 5 children | 48(12%) | 1(0.2%) |

significantly associated with fruit and vegetable consumption at p-value less than 0.05.

Employment status of women was significantly associated with fruit and vegetable consumption. Unemployed women were 3.4 (AOR =3.39, 95% CI: 1.17- 9.77) times more likely to have adequate intake of fruit and vegetable than employed women. Concerning to women's marital status, unmarried participants ate 0.03 (AOR=0.03, 95% CI: 0.01-0.12) times more than married participants, and participants who had communication about fruit and/or vegetable intake with husband were 0.15 (AOR=0.15, 95% CI: (0.05-0.43) times more likely to have adequate fruit and vegetable consumption than who hadn't communication with their husband Table 3.

Discussion

In this study, about 6.8 % of the women had consumed adequate fruit and /or vegetable (\geq five servings), whereas 93.2 % had consumed inadequate (< 5 servings) fruit and/or vegetable in any day of the week. The mean intake of fruit and vegetable in this study was 1.07 (SD 0.25) servings/day. This is lower than the finding from Myanmar where the mean intake was 1.5 (SE 0.1).

In this study, the magnitude of adequate (\geq 5 and above servings/day) consumption of fruit and/or vegetable was 6.8%. This finding is lower than a study in Ghana which was 27.8% in Uganda (12.2%) [21], Republic of Congo but higher than the study in Tanzania(2.8%) and Zambia (3%) and Mozambique (5%) respectively(21,30).

About 212 (51.7%) of the participants did not eat fruit and/or vegetable in any of the weeks. This proportion was different from telephone interview in Brazil where 57.1% of participants consumed fruit regularly [7]. And this finding was also different from a National Health Survey at a household level (PNS) and a telephone based interview (Vigitel) in Brazil where 41.8% and 23.6% of the participants

Table 3: Bi-variables and multivariate analysis of fruit and/or vegetable intake and associated factors of study participants, Addis Ababa, 2021(n=410).

| Variables | Category | Fruit and vegetable as WHO Recommendation(≥5 servings) COR | | |
|--|---------------------------|--|---------------------|---------------------|
| | | [95%CI] | AOR [95%CI] | |
| Educational level | Degree and above | 8(2%) | 4.00(1.217, 13.51)* | |
| | Diploma | 5(1.2%) | 0.808(0.23, 2.89) | |
| | Secondary school | 5(1.2%) | 1.29(0.36, 4.65) | |
| | Primary school | 5(1.2%) | 0.63(0.206, 2.62) | |
| Employment status | No formal education | 5(1.2%) | 1 | |
| | Employed | 15(3.6%) | 2.85(1.31, 6.22)** | 3.39(1.17, 9.77)** |
| | Unemployed (Ref) | 13(3.2) | 1 | 1 |
| Marital Status | Married | 11(2.7%) | 18.81(8.06, 43) *** | 0.03(0.01, 0.12)*** |
| | Single (Ref) | 17(4.1%) | 1 | 1 |
| Educational level of husband | Degree | 6(21%) | 2.52(0.84,7.54)* | 0.14(0.61,5.7) |
| | Diploma | 8(28.6%) | 1.34(0.49, 3.6) | 0.57(0.16,2.02) |
| | Secondary school | 9(32.1%) | 0.83(0.27,2.57) | 0.67(0.16,2.92) |
| | Primary school | 0(0%) | 0.02(0.2, 0.23) | 0.000(0.00,0.01) |
| Communication between husband and wife | No formal education (Ref) | 5(17.9%) | 0.01(0.12, 0.21) | 1 |
| | No | 6(1.4%) | 7.91(3.13, 20) *** | 0.15(0.05, 0.43)*** |
| | Yes (Ref) | 22(5.4%) | 1 | 1 |

Key: *Candidate covariates at p-value < 0.25 in bi-variables and ** statically significant factors at p-value < 0.05, *** statically significant factors at p-value < 0.01.
Ref= Reference

in the PNS and Vigitel consumed fruit and vegetable respectively [26]. The observed differences might be a difference in study setting, year of study time, sample size, study design and differences in demographic, economic, socio-cultural differences of study areas. In addition which might be due to differences in study setting where the present study focused only on selected public health facilities.

Factors found significantly associated with adequate fruit and/or vegetable consumption were employment status, marital status, and communication b/n wife and husband.

Being employed (AOR =3.39, 95% CI: 1.17- 9.77), married (AOR=0.03, 95% CI: 0.01- 0.12) and presence communication between wife and husband (AOR =0.15, 95% CI: 0.05- 0.43) were factors associated with adequate fruit and vegetable consumption in Addis Ababa [28].

Based on the findings, fruit and vegetable intake was significantly associated with employment status. The odd to have adequate fruit and vegetable consumption of employed women was 3.39 times higher than unemployed women [(AOR=3.39, 95% CI: 1.17- 9.77). This could be employed women may have resource to spend on fruit and vegetables. Fruit and vegetable intake was significantly associated with marital status. The odd to have adequate fruit and vegetable consumption of married 0.03 times higher than single women (AOR=0.03, 95% CI: 0.01- 0.12). This could be their husband may have good income. Fruit and vegetable intake was also significantly associated with communication between wife and husband. The odd to have adequate fruit and vegetable consumption of communication b/n husband and wife 0.15 times higher than no communication between wife and husband (AOR =0.15, 95% CI: 0.05- 0.43). This finding was in line with the study conducted in Uganda[21].

Conclusion

The study examined fruit and/or vegetable consumption among reproductive age women. In this study, consumption of fruits and/or vegetables was generally very low. It was a little higher in single and unemployed as compared to married and employed respectively. There was also higher consumption in women who communicated

about F&V with their husband than who did not communicate with their husband. Marital status, employment status and communication between wife and husband had statistical significant relationship with fruit and/or vegetable consumption.

Recommendation

- FMOH:-Should design policies to promote fruit and vegetable consumption to combat low consumption which results micronutrient deficiencies.
- Addis Ababa health office:-Should design pragmatic interventions (e.g. adequate health education and promotion programs on fruits and vegetable) to promote sufficient FVs consumption.
- Researcher:-Further research is recommended with different study design (Community based) to address other variables which were not included in this study.

Limitation of the study

This study has some limitations. Lack of appropriate measurement for of sizes of F&V consumption servings was measured by self-reporting based on retrospective accounts, hence might be prone to recall bias, random errors, and other social desirability concerns (e.g., under-or over reporting). The estimation of FVs consumption may be subjective and could affect the adequacy of servings at a particular point in time. The use of cross-sectional data did not allow assessment of changes of FVs consumption over time and further restricted the control of other factors (e.g., cost, accessibility, availability) that might influence intake. The data set is also relatively old. Furthermore, due to the study cross sectional design, causal conclusions between noted studied variables cannot be drawn.

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