DR.BRR GOVT DEGRRE COLLEGE JADCHERLA

MAHABUBNAGAR, TELANGANA

DEPARTMENT OF BOTANY

Student Study Project on

" IMPACT OF VEGETABLE ON HB AND WEIGHT OF DEGREE STUDENTS "

Presented By

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DECLARATION

We hereby declare that the project work entitled **"Impact of Vegetables on Hb and Weight of Degree Students",** is a genuine work done by us under the supervision of **P.Srinivasulu,** Head,Department of Botany, for the Department of Botany, Dr. BRR Government College, and it has not been under the submission to any other Institute/University either in part nor in full, for the award of any degree.

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CERTIFICATE

This is to certify that the project work entitled "Impact of Vegetables on Hb and Weight of Degree Students." is a bonafide work done by the students of B.Sc,B.Z.CA,E/M,III Year Students, **A.Jaya sree , G.Nishanth ,L.Pavan ,Sameera Begum , S.Sharanya** under my supervision for the award of Project Work in Botany, for the Department of Botany, Dr. BRR Government Degree College, Jadcherla and the work hasn't been submitted to any other College/University either in part nor in full, for the award of any degree.

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…. Shashidar,Yugendar,Arshith,

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D E C L A R A T I O N

We hereby declare that the project work entitled **"Impact of Vegetables on Hb and Weight of Degree Students",**is a genuine work done by us under the supervision of **P.Srinivasulu**, Head,Department of Botany, for the Department of Botany, Dr. BRR Government College, and it has not been under the submission to any other Institute/University either in part nor in full, for the award of any degree.

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INTRODUCTION

CHAPTER-1

Young adulthood is a particularly important time for the promotion of healthy eating, because several behaviors are developed and established during this period . However, as characterised as a transitional life stage which may include many significant changes , such as leaving the family home, commencing college, entering the work force , partnering , or becoming a parent , many people lack interest in following a healthy and balanced diet , or struggle to prioritise this .

Young adults include people from different background in a relatively large age range , and the great majority of college students are part of this group . They are begging to take responsibility for their own dietary habits as they undergo a critical period in the consolidation of eating habits and behaviours . A review study demonstrated that most college students have unhealthy eating behaviours , including high in take of fast foods, snacks , sweets , soft drinks and alcoholic beverages, and low in take of fruits , vegetables , fish , whole grains and legumes .

The frequent poor dietary behaviours among young adults are among the key factors contributing to a weight gain trajectory and increased risk of no communicable diseases (NCDS) , such as heart disease , cancer and diabetes (type-2) NCDS are estimated to cause 41 million deaths each year, equivalent to 71% of deaths globally. according to the world health organization (WHO) the risk of developing NCDS could be reduced through and in take of _> 400g of fruits and vegetables per day, which would also help to ensure an dequate daily ingestion of dietary fibre. despite initiatives designed to increase fruits and vegetables intake, people across the global struggle to meet this recommendation .

While the health benefits of a high fruits and vegetables consumption are well know and considerable work has attempted to improve intakes , increasing evidence also recognizes a distinction between fruit and vegetables, both in their impacts on health and in consumption patterns. A recent review suggests enhanced health benefits from a high consumption specifically of vegetables due to their protein and fibre content,yet intakes remain low additionally,studies have highlighted ethical,environmental and cost advantages to diets with a higher vegetables compostion.not with standing,evidence demonstrates that the intake of fruits and vegetables terds to be higher due to their sweet taste,softer texture and easier manner of eating usually raw and as a snack or dessert) A systematic review demonstrated that interventions to increase fruit and vegetable intakes more often target fruit and typically report grater success in fruit consumption campared to that of vegetables. even so, few studies on

food choice and eating behavior have investigated vegetable intake as a separate variable.this is an important limitation of existing knowledge, since the factors that influence fruits consumption may not be applicable to vegetables the majority of ineterviewntions aiming to increase the intake of vegetables asa separate and distinct group have focused on younger children.

Sufficient intake of fruit and vegetables (F&V) has been related epidemiologically with reduced risk of many non-communicable diseases. Currently, much interest are focused on the vital role of antioxidants which impart bright colour to F&V and act as scavengers cleaning up free radicals before they cause detrimental health effects . Moreover, fibers found in F&V have been shown to reduce intestinal passage rates by forming a bulk, leading to a more gradual nutrient absorption hence preventing constipation. They can be fermented in the colon, increasing the concentration of short chain fatty acids having anticarcinogenic properties and maintaining gut health. Several studies have highlighted the CVD risk-reducing potential of F&V whereby their intake were strongly associated with lower cardiovascular risk factors such as lower blood pressure (BP), cholesterol and triacylglycerol thus preventing premature cardiovascular disorders . Recently Habauzit et al. reported that fruits containing a high amount of anthocyanins, flavonols and procyanidins, such as berries, grapes and pomegranate are effective at decreasing cardiovascular risk while citrus fruits and apples had a moderate effect on BP and blood lipid level. An increased consumption of carotenoid-rich F&V maintains the cholesterol level in blood since they reduce oxidative damage and cause an increase in LDL oxidation resistance . An increased consumption of cruciferous vegetables was also reported to cause a decrease in the risk of intestinal, bowel, thyroid, pancreatic and lung cancer .

F&V have also been suggested to prevent osteoporosis in adults mainly for their rich sources of calcium and other vitamins which are vital in bone health . The high fiber content of F&V may play a role in calcium absorption and reduce the ‘acid load’ of the diet enhancing bone formation and suppressing bone resorption which consequently result in greater bone strength . Moreover, phytoingredients in F&V such as gooseberry, curcumin, and soya isoflavones have shown to be protective against lens damage which occurs due to hyperglycemia and certain flavonoids such as quercetin can prevent oxidative stress in the pathogenesis of glaucoma . Also, a high intake of F&V was inversely associated with the risk of COPD and respiratory symptoms . Higher total fruit and vegetable intake is also associated with lower risk of cognitive decline hence proved beneficial for mental health . Based on available evidence, a clear relationship between F&V and diseases has been well established however no protective effect of overall fruit and vegetable intake (FVI) against lung diseases were found. Green leafy vegetables, rather than fruit, were suggested to have a genuine protective effect against lung cancer . Risk of proximal colon cancer, rectal cancer and aggressive and non-aggressive urothelial cell carcinomas are not associated with FVI and no protective role were seen on the risk of endometrial cancer in post menopausal women . The accepted recommendation is to consume a variety of F&V because studies demonstrate that a combination of F&V have more

potential benefits rather than a single fruit or vegetable . However further studies are warranted.

Design and Participants

This study reviewed data from 71 The majority of participants were female (69.8%), and the mean age of the students was 21.6 years old. Almost 95% of the studies (n = 67) were designed as cross-sectional. The other designs were mixed (cross-sectional and longitudinal) , microlongitudinal (21 days) , time series analysis and retrospective survey .The majority (70.4%) of the studies focused on evaluating elements of the whole diet of participants. Thirteen studies were specific regarding the consumption of fruits and vegetables , while only three studies were exclusively focused on vegetables . Five studies investigated adherence to the Mediterranean diet and its relation with the consumption of specific food categories, such as vegetables . The most usual instrument for assessing food consumption was the food frequency questionnaire (FFQ), used by twenty-eight studies . Two of them combined the FFQ with 24-h recalls . Another study also chose 24-h recalls for assessing food consumption, while three studies used diet story questionnaires . Thirty-one studies declared having used questionnaires, adapted or designed specifically for the study purposes . Seven studies used prospective methods for evaluating food consumption diary. Another three studies employed a 7-day food record, one of them combined with a FFQ , and two studies a 3-day food record.

Vegetable Definition

Most studies (60.6%) did not define what was being considered as vegetables in their investigations. The term was only presented in the tables or text referring to the group, without specifying whether participants were told what to consider as a vegetable, or whether different types of vegetables consumed were grouped in this category. From the studies which mentioned what was considered in the analysis, eight divided vegetables into raw or fresh vegetables (including salads), and cooked vegetables . Another six studies declared that the intake of both raw and cooked vegetables was considered to calculate “vegetable consumption”. One study only considered salad and raw vegetables in their analysis. Four studies divided vegetables into different categories: green, yellow, other vegetables, and salads , sautéed leafy greens, leafy greens, nonleafy cooked vegetables and nonleafy raw vegetables; fresh, frozen, canned and stewed ;and fresh, tinned, legumes and potatoes ,Finally, eight studies included different forms of vegetables to create a single variable in their analyses: green-, red- or yellow-coloured vegetables; vegetables without tubers, roots and bananas, fresh, canned or juice; vegetables and juices; raw, cooked, canned or frozen; coloured and other types of vegetables, mushrooms and sea vegetables; fresh, cooked or frozen, as well as green salad and did not count potatoes; and vegetable side dishes or salads .It is clear that the complexity of defining vegetables either by botanical or culinary descriptors makes it difficult to provide an aggregated analysis.

No study mentioned the degree of food processing related to the vegetables consumed i.e., whether the vegetables were fresh, minimally processed (e.g., washed, sliced, peeled), juiced, or preserved in brine or sugar. Additionally, there was no discussion regarding the type of production of these vegetables (organic or conventional), if they were originated from genetic modified crops, or the type of commercialization, for instance, whether they were part of fair trades, locally produced, or imported from other countries.

REVIEW OF LITERATURE

CHAPTER-2

Sufficient intake of fruits and vegetables has been associated with a reduced risk of chronic diseases and body weight management but the exact mechanism is unknown. Vegetable consumption is a predictor for improved health outcomes, such as reduced obesitiand likelihood of food-related noncommunicable diseases. Young adults are a key population, being in a transitional stage-of-life: Habits gained here are taken through the lifespan. This review establishes insight into the consumption of vegetables among young adults during their college/university years, and factors associated with increased consumption. Seventy-one papers were extracted,published between. Search terms related to consumption; vegetables;and college/university setting and sample. A diverse range of definitions, guidelines, and study approaches were observed. Findings identify that the majority of students do not consume World Health Organization recommendations. Being female was the most frequent predictor of higher intake of vegetables, and no consumption patterns were identified by countries. Living at family home; body mass index; happiness and stress level; perceived importance of healthy eating; socioeconomic level; breakfast consumption; stage of study; openness to new experiences; sleep pattern; nutrition knowledge; activity level; alcohol usage; and energy intake were identified as influential factors. Public policies and new strategies to encourage vegetable consumption among college students are indispensable, especially targeting s The relationship between vegetable consumption and measures of adiposity was assessed in cohort studies. Seven databases were searched from inception until. The quality of individual studies was assessed using the Joanna Briggs Institute Critical Appraisal of Cohort Studies tool. The Grading of Recommendations Assessment, Development and Evaluation (GRADE) system was applied to determine the quality of the body of evidence. Ten studies were included. Six measured change in vegetable intake over time. Two showed that increasing vegetable consumption resulted in weight loss of 0.09–0.1 kg over four years ($p < 0.001$). Increased vegetable intake was also associated with a reduced risk of weight gain and overweight or obesity (Odds ratios (ORs) ranged from 0.18 to 0.88) in other studies. Four studies measured vegetable intake at the baseline only. One showed that intakes >4 servings/day reduced the risk of weight gain (OR 0.27 (95% confidence interval (CI) 0.08–0.99) and another found an inverse association with waist circumference in women (−0.36 cm per vegetable serving/day). This review provides moderate quality evidence for an inverse association between vegetable intake and weight-related outcomes in adults. When these findings are coupled with no apparent harm from vegetable consumption, the evidence-base can be used with acceptable confidence to guide practice and policy. In order to more effectively promote fruit and vegetable intake among children and adolescents, insight into determinants of intake is necessary. We conducted a review of the literature for potential determinants of fruit and vegetable intake in children and adults

Material and Methods

CHAPTER-3

The Scoping review included quantitative data from observational investigating vegetable consumption among young adults in a college setting papers were included if vegetable consumption was assessed as a primary focus or part of a diet where data on vegetable consumption could be analysed separately Data were evaluated for significance to determine which factor are associated with increased vegetable consumption among the targeted Group.

This study adopted an effective bibliographic research strategy aimed at reducing bias in the selection of articles for review A literature search was conducted in Octobar 2018 in the following data bases, scopus, MEDLINE/pub med (via national library of medicine) and scientific Electronic library in line (scielo) An additional search using the snowball method was performed, scrutinizing the references in the review studies obtained from the initial search to insure a comprehensive data collections the terms is used in the search comprised four categories that were combined using the Boolean ruling operator “AND” as follows (a) consumption (food consumption or food intake or eating) (b) type of food (vegetable) (c) setting (college or university or “higher education” or faculty) and (d) sample (student or freshman or sophomove or young adult or millennial or late adolesc or emerging adult or “new adult”) The combinations were adopted to use more general or more specific terms based on the limitations of each data base for the scopus and scielo data base search was performed considering the tiltle, abstract and keywords, while in medline/pubmed the terms were searched in the full text due to the low number of references (n=20) when searching just title and abstract. preliminary searches were helpful for adjusting search terms and their combination in order to find the largest possible number of article related to the topic.

Studies published related Portuguese, Spanish and English were included. This was possible due to the international team of authors which enable full assessment of studies published these three languages. it was felt that inclusion of the widest possible range or studies published enhance the value of the review,representing finding from a wide diversity of cultures and settings exclusion criteria comprised qualitative studies,studies focusing on eating disorders(eg.bulinia)or specific groups(eg.athlets,pregnant women),biomarkers and supplementation,studies with patients (eg.menopause women,anaemics,people with (veliac diseases) specific minerals association with vegetables consumption;validation and reliability of questionnaries,hypothetical scenarios and case-control studies intervention studies were not included to ensure that this review focused on establishing a base line account and to avoid repetition of the recent systematic review by appletion .

Duplicates were removed, followed by irrelevant titles.The abstracts of the remaining papers were reviewed,and potential studies were considered based on the inclusion/exclusion criteria the studies which analysed the intake of food or food groups ,or the dietary patterns of college

students were read and judiciously analysed in full text. Studies were not considered if they presented data on aggregated fruit and table consumption; if they presented data of consumption in scores where it was impossible to estimateto consumption;if they were not developed with college students shows how the database search and articles selection process resulted in 71 articles being included in this review.

The data of selected studies were extracted to a Microsoft excel spreadsheet for analysis, including study details(ic.authors,location,years of publication ,and design),study population,sample and participant demographics,food intake assessment instruments,definition of vegetables,data on vegetable consumption and associated factors with increased vegetable intake. The information extracted from each study is presented in the summery tables. The percentage of male and female participants and mean age across all studies was calculated. The common results were grouped and presented separately according to the type of data provided line, frequency of overall intake, frequency of intake according to portions/servings, average intake of portions/serving per weak, consumption in grams/day and comparison of consumption with relevant guidelines .mean daily vegetable intake was calculated across studies presenting the consumption of vegetables in frequencies of intake A few studies are presented in more than one table.

RESULT

CHAPTER-4

Vegetable Consumption

Vegetable Consumption: Vegatable Consumption is Summarised in file tables, according to the type of Outcome measure Provided the studies. In the first. from 30 Studies are Presented table, data with the frequency of Vegitable intake. Mean frequency of daily Vegetable intake was 40.21%. Varying from 11-2% to 72·4% The highest frequency of daily of Vegetable intake was observed in finland, where 72.4% of female and 57-31 of males et Vegetables daily in a study. Conducted only with female participants ate fresh or Cooked Vegetables daily these 29.5% more than One a and from day Other Studies also demonstrated a high frequency of intake such as in Lithumania where 60.0%. Eat Vegetables 4-7 times a Week, and in Italy where 42.1%. of partipants Late Vegetables at least Once a day, and 16%.56 million a week."Vegetable Consumption”One Study Only Considered Salad and raw vegetables in their analysis.. four studies olivided vegetables into different Categorise green, yellow other Vegetables, and Salads Saut cet leafy greens, leafy greens, nonleafy looked Vegetables and nonleafy raw vegetables fresh, frozen, Canned and stewed and fresh, tinned. Legumes and potatoes finally, eight studies included different Vegetables, fresh, Cooked or forzen, green forms of , as well as. salad and did not count potatoes. and Vegitables Side dishes or Salads. It is clear that the Complexity of defining Vegetables either by botanical or Culinary descriptors makes it. difficult to provide aggregated analysis.analo Study mentioned the degree of food, Processing i.e, whether related to the vegetables Consumed the Vegetables Were fresh, minimally Processed (eg. Washed, sliced, peeled), juiced or preserved in brine or there was of production Sugar Additionally, no discussion regarding the type OY there Vegetables. (organic Convention) if they were originated from genetic modified Crops, or the type of Commercialization on the other hand, Some studies demonstrate frequencies of daily intake as low as 11.2%. in Saudi Arabia 12.4%. in South Africa and 14-32 im babie Brazilian Studies showed the lowest frequencies of Vegetables Intake et al's Zimbabwe' B study 28.41. and 25.5% of college students answered never eating Yaw Vegetables | Salads and Cooked Vegetables, respectively in Cansian et al's study 125.21. of participants answered never or resely eating saufed leafy greene Associated factors with increased intake were being female regular health self-rate lower BMI and lower blood pressure (both gender in later years of study being a quota not Student (an affirmative action approved by Law which reserves 50% of Spots in Brazil federal Universities for students Coming, from Public Schools, low-income families and wh are of Afioican or indigenous desecent the Importance given living for eating healthy and at family home. The mean age of participants was 19-211.13 years, 92.9% were living in Urban areas and. most them (92.4%) were single; with ens grificant between anemie and those with normal hemoglobin level

Socio -demographic Students data the studied by hemoglobin level.

Studied Variables	Hemoglobin level Normal N=141 (%)	Anemia N=70% (%)	Total N=211 (%)
Age in year (Mean+SD)	19.1+0.64	19.3+1.72	19.2+1.13
Residence			
Rural	11(7.8)	4(5.7)	15(7.1)
Urban	130(92.2)	66(94.3)	196(92.9)
Perceired Socioeconomic Standard			
Moderate	103(73.0)	51(72.9)	154(73.0)
High	38(27.0)	19(27.1)	154(27.0)
Malital status			
Ever married	11 (7.8)	5(7.1)	16(7.6)
Never married	130(92.2)	65(92.9)	195(92.4)

Pearson's chi Square test, p< 0.05

^ p value of student-t test,p <0.05

Less than half ofparticipants (46.0%) had normal weight; 33.0%. Were anemic (their mean BMI = 21:31 1-66, mean ttb /. = 10.9 ± 1.39)

Distribution of BMI by hemoglobin level among studied group of Students.

BMI	**Hemoglobin level**		**TOTAL N(%)**
	Normal N (%)	**Anemian (%)**	
Under weight	59	28	87/100.0/41)

	(67.8/418)	(32.2/400)	
Normal	65 (67.0/46.1)	32(/330/45.7)	97 (100.0/46).
Over weight	15 (65.2/10.6)	8(34.8/11.4)	23(100.0/10)
Obesity	2(50.0/14)	2(50.0/2.9)	4(100-0/1.9)
Total	141	70	211 (100.0/100.0)
	(66-8/1000)	(33-2/100-0)	

Nearly two fifths (41.2%) were Under Weights 32.2% of them were anemic (mean BMI = 16.2 +1-55, mean +16% = 113+ 0.51) Hb% =113±0.51)

One tenth (10.9%) of participants were Over weight 34 ·8% of them were anemic (mean) BMI = 27 4 + 0.81 (mean Hb % = 10.9±0.80). Although minority a them were Obese (19%), 50·0% were anemic (mean BMI = 34.0± 0·10, mean Hb/. = 116 +0-10) Generally Speaking the prevalence the of anemia was 32.2%. With insignificant difference between BMI and Hb%. Nearly two thirds of participants (67.3%). were menstruating by age of 13-15 years; getting menses every 27-30 days (53.1%.) and 58.8%. had regular menses; with in significant difference between anemic and those with normal hemoglobin level.

Reproductive history of participants by hemoglobin level.

Variables	Hemoglobin level		Total	p Value
	Normal N=141 (%)	Anemia N=70 (%)	N=211 (%)	
Age of menarche in years				
10-12	39(27.7)	19/27-1)	58(27.5)	
13-15	97(68.8)	45(64.3)	142 (67.3)	p=0.29
>15	5(3.5)	6(8.6)	11(52)	
Regularity of menstruation. 87 (412) Irregular 53 (376) 34 (486) 87 0-12)				
Irregular	53 (376)	34 (486)	87 (41.2)	P=0.12

Regular 88 (62.4) 36(514) 124 (58-8)

Interval between a Successive means

(20 days 46 (326) 26 (37-1) 72 (34-1)

21-30 days 78 (55.3) 34 (48-6) 112 P=0.11

(53.1)

31 -40 days 16(11.3) 6(8.6) 22(10.4)

>40 Days 1(0.7) 4(5.7) 5(2.4)

for ever married women (N=16)

Gravitity 0.0 ±0.00 1.6 ± 2.19 1·6±2·19

(mean ±SD)

Number of 0.0 ±0.00 2.0 ± 274 2.0 ± 274

sd)

/100-0/1.5) 211 (1000/1000

were anemic (mean bmi-162+1-55, mean

16 (11-3) 6(8.6) 92 (10.9)

31-40 days 1 (07) 4(57) 5(24)

540 days

gravidity (mean ±-for ever married 0.0+ 0.00 domen (n=16) 1.6 ± 2.19 1·6±2·19 living

children

(mean ±SD)

current use of contraceptives

No	8 (72.7)	5(100.0)	13 (81-3)	p=0·432
Yes	3(27.3)	0 (0.0)	3 (18.7)	
Pills	2 (6.67)	0(0.0)	2(66.7)	
safe period	1(333)	0(0.0)	1(33.3)	

pearson's chi square test P<0.05

More than One third (37.5%) of married participats were pregnant, 3 months period since last delivery or abortion and did not lapse in 60.0% of Cases whereas, Contraceptive users were 18.7%. 66.7%. of them were Using Contraceptive pills, with insignificant difference between anemic aud those with normal hemoglobin level.

A Significant association (p = 0.002) has reported between the presence of anemia and rate of Consumption of fresh vegetables and fruits among the studied group.

Consumption of red meat Once per day has been reported in 26.5% of day per the participant While 29.4% and 27.5% were consuming legumes and fast food once per week respectively, with insignificant difference b/w anemic and those with normal hemoglobin level - One fourth (25%) the participants Consuming soft drinks more than once per day mean while milk produts were consumed by 30.8% Once per day; with. different b/w anemic and those with normal hemoglobin level:

"Physical and dietary habit by hemoglobin. Level

Dietary	Hemoglobin		Total	p-value
Habits	Normal	Anemian	N=211	
	(%)	(%)	(%)	
Fresh Vegetables and fruits.				
More than	13(9.2)	5(7.1)	18 (5)	
Once /day	(23/16.3)	12/17.1)	35 (16.6)	p=0.002
-3-4	22(15.6)	17(24.3)	39(18.5)	
Times/Week				

- 4(2.8) 11(15.7) 15(7.1)

Once/week

-less than 79(56·0) 25(35.7) (04 (49.3)

Once/week

Red meat 13(9.2) 6(8.6) 19(9.0)

more

than

Once / day

- Once /day 35(24.8) 21 (30.0) 56 (26.5)

-3-4 35(24.8) 12(17.1) 47(22.3) P=0.717

Times/week

- 23(16.3) 14(20.0) 37

Once / week (17.5)

Less than 35(24.8) (7 (243). 52.

Once / week (24.6)

Legumes

More 9(6.4) 1(1.4) 10(4.7)

Them

Once /day 12(8.5) 5(7.1) 17(8.1)

-3-4 26(18.4) 16(22.9) 42 p=0.476

Times/week (19.9)

- 43(30.4) 19(27.1) 62

Once/week (29.4)

-lessthan 51(36.2) 29(41.4) 80

Once/week (37.9)

FAST FOOD

more than 13(9.2) 6(8.6) 19(9.0)

Once/day

Once/day 27 (19.1) 10 (14.3) 37

(17.5) P =0.729

-3-4 35/24-8) 15(21.4) 50

Times/week (23.7)

38(27.0) 20(28.6) 58

Once/week (27.5)

Lessthan 28(19.9) 19(27.1) 47

Once/week (22.3)

SOFT DRINKS

-more 34(24.1) 19(27.1) 53

Than (25.1)

Once/day

Once/day 30(21.3) 16(22.9) 46

(21.8) p=0.451

-3-4 31(22.0) 8(11.4) 39

(18.5)

1 26(18.4) 14(20.0) 40

Once/week (19.0)

-less than 20(14.2) 13(18.6) 33

Once/week			(15.6)
MILK PRODUCTS			
More	21(14.9)	6(8.6)	27
Than			(12.8)
Once/day			
Once/day	49(34.8)	16(22.9)	65
			(30.8) P=0.153
-3-4	25(17.7)	19(27.1)	44
			(20.9)
-	13(9.2)	9(12.9)	22
			(10.4)
Less than	33(23.4)	20(28.6)	53
Once/week			(25.1)

*pearson's chi-square test,p<o.o5

Half of the participants (50.2%) were drinking tea immediately postprandial,only 10% were taking nutritional supplements and 7.6% were taking iron or folic acid supplements with insignificant different between anemic and those with normal hemoglobin level .

Habits accustomed by studied participants by hemoglobin level.

Dietary	**hemoglobin level**		**total**	**p-value**
Habits	**normal**	**anemia**	**N=211**	
	N=141	**N=70**	**(%)**	
	(%)	**(%)**		

Post prandial tea drinking

No 66(46.8) 39(55.7) 105 (49.8)p =0.371*

Yes 75(53.2) 31(44.3) 106 (50.2)

Nutritional supplements

No 127(90.21) 63(90.0) 190 p=0.987*

Yes 14(9.9) 7(10.0) 21(10.0)

Iron or folic acid supplements

No 128(90.8) 67(95.7) 195 p=0.202* (92.4)

Yes 13 (9.2) 3(4.3) 16(7.6)

Anemia sevority classification

Grade	Hb level(g/bl)	Description
1	10-lower limit of normal	mild
2	8-<10	moderate
3	6.5-<8	severe
4	Life threatening	Life threatening
5	Death	Death

According to the national cancer institute and the national institutes of health anemia can be classified into five grades.

Anemia will correct within 2to4 months if appropriate iron doesages are administrated ans underlying cause of on deficiency is corrected

Continue iron therepy an additional 4 to 6 months (adults) after the hemoglobin normalizes to replenish the iron stores

Treatment of Mild and Moderate

GROUP	DOSAGE / DAY
CHILDREN 2-5 YEARS	20-30 mg iron
CHILDREN 6-11 YEARS	30-60 mg iron
ADOLESENTS AND ADULTS	60-mg iron

HEMOGLOBIN LEVEL CHAT

MALE`S	
Age 12-18 years	13. To 16.0(mean 14.5)
Age > 18 years	13.6 to 17.7 (mean 14.5)
FEMALES	
Age12-18 YEARS	12.0 TO 16.0(MEAN14.0)
Age> 18 Years	12.1 to 15.0(mean 14.0)
CHILDREN	
Birth	13.5 to 24.0(mean 16.5)

<1 month	10.0to 20.0(mean 13.9)
1-2 months	10.0 to 18.0(mean11.2)
2-6 months	9.5 to 14.0(mean 12.6)
6 months – 2 years	10.5 to 13.5(mean 12.0)
2-6 years	11.5 to 13.5(mean 12.5)
6- 12 yaers	11.5 to 15.5 (mean 13.5)

NORMAL HEMOGLOBIN LEVELS

AGE	NORMAL HEMOGLOBIN LEVEL (G/DL
NEW BORNS	13.5-24
<1 MONTH	10-20
1-2 MONTHS	10-18
0.5 TO 2 YEARS	10.8-13.5
2 TO 6 YEARS	11.5-13.5
6 TO 12 YEARS	11.5-13.5
FEMALE: 12- 18 YEARS	12.0-16.0
MALE:12 -18 YEARS	13.0-16.0
MALE: > 18 YEARS	13.6-17.1
FEMALE: >18 YEARS	12.1-15.1
MEN AFTER MIDDLE AGE	12.4-14.9
WOMEN AFTYER MIDDLE AGE	11.7-13.8

S.NO	NAME OF THE STUDENT	CLASS/ VILLAGE	BREAK FAST	LAUNCH	DINNER	WEIGHT	HB VALUE
1	JYOTHI LINGAM	B.COM 1ST YEAR JADCHERLA	TOMATO RICE WITH CURD	RICE AND WITH RADDISH	RICE AND LEAFY VEGETABLES	49	14.3
2	MD.ZABI	MCCS 1ST YEAR E/M MBNR	FRIED RICE TOMATO CURRY	RICE WITH CHICKEN	CHAPATHI CHICKEN	76	13.5
3	HARSHA	B.COM 1ST YAER MBNR	DOSA/ GROUNDNUT CHUTNY	RICE WITH BEETROOT	BEETROOT AND CARROT	50	13.2
4	K.GANAPATHI	B.COM 1ST YEAR JADCHERLA	RICE RADDISH	RICE WITH LADY'S FINGER	RICE AND LADYS FINGER	54	10.6
5	M.SAI KUMAR	B.COM 1ST YEAR JADCHERLA		RICE WITH BEAN CURRY	BEAN AND TOMATO	46	14
6	B.TEJA	B.COM 1ST YEAR JADCHERLA	CHAPATHI AND BEAN	RICE WITH BRINJAL	CABBAGE	42	15.4
7	BHANU PRAKASH	B.COM 1ST YAER TIMMAJIPET	VADA	TOMATO CURRY	RICE AND BRINJOL	51	15.3
8	T. KISHOR	B.A 3RD YAER JADCHERLA	IDLT /GROUNDNUT CHUTNY	CAPSICUM	RICE WITH CABBAGE	72	16.5
9	P. BHAVANA	B.COM 1ST YEAR JADCHERLA	RICE AND SPINACH		CURD RICE TOMATO CURRY	45	13.6
10	G.NISHANTH	BZCA 3RD YAER AIYYAVARIPALLY	CHAPATHI BEANIS	RICE AND CUCUMBER	CAULI FLOWER	53	13.2

11	P.SIMBHADRI	B.COM 1ST YAER VALLUR	DOSA/GROUNDNUT CHUTNY		DRUM STICK AND TOMATO	68	14.3
12	ANIL NAYAK	MPCS 1ST YAER VALLUR	ROTI AND CLUSTER BEANS	RICE AND SPINACH	RICE AND DAL	55	12.1
13	N.SRIKANTH	MPCS 2ND YEAR KALWAKURTHY	ROTI AND SPINACH	RICE AND DAL	RICE ROTI BITTER GOURD	53	8.7
14	PRAVEEN KUMAR	BA 1ST YEAR KANAPUR	CHAPATHI AMARANTHUS		RICE AND TOMATO ONION	53	15.8
15	P.MADHU	BA 1ST YEAR IPPALAPALLY		RICE AND BRINJAL	CHAPATHI RICE AND BRINJAL	35	15
16	NAVEEN KUMAR	BZC 3RD YEAR GADWAL	CHAPATHI EGG CURRY	RICE AND TOMATO CURRY	CHAPATHI AND LADYS FINGER	48	13
17	SAMEERA	BZCA 3RD YEAR MIDJIL	CHAPATHI LADYS FINGER	RICE AND DOL	RICE AND GREEN VEGETABLES	51	12.5
18	K.AJAY KUMAR	B.A 2ND YEAR VALLUR	IDLY/GROUND NUT CHUTNY	CURD RICE	RICE AND BRIJOL	50	14.6
19	D.BHAVANI	BA 1ST YEAR RANGAREDDY GUDA	CHAPATHI AND TOMATO ONION	RICE AND GREEN VEGETABLES	RICE AND SPINACH	52	6.8
20	P. SURESH	B.A 1ST YEAR VATTEM	RICE AND LEAFY VEGETABLES	RICE WITH S[PINACH	CURD RICE LEAFY VEGETABLES	58	11.5

21	P.LOKESH	B.A 1ST YEAR KOTHHUR	ROTI AND BRIJOL CURRY	CHPATHI AND TOMATO CURRY	RICE AND CUCUMBER	57	12
22	K.SHESHIRE KHA	BZC 3RD YAER JADCHERLA	ROTI AND BEET ROOT	RICE AND BEAN	RICE AND BEAN CURRY	40	9.8
23	S.SANDYA RANI	MZC 3RD YEAR JADCHERLA	RICE AND SPINACH ONION	RICE WITH GREEN BEAN	CHAPATHI AND GREEN BEAN	50	10.6
24	POOJA SRI	MZC 3RD YEAR JADCHERLA	CHAPATHI CUCUMBER	RICE WITH THOTAKURA	RICE AND SPINACH	37	9.3
25	N. ANITHA	BZC 3RD YEAR BALNAGAR	ROTI AND BEAN CURRY	CHAPATHI LADYSFINGER	RICE AND BOTTLE GUARD	39	10.6
26	P. VASANTHA	BZC 3RD YEAR MALLEPALLY	PURI AND KURMA	RICE WITH CAPSICUM	RICE AND CAPSICUM	45	11.4
27	HARI KRISHNA	B.A 1ST YEAR CHILUR	IDLY AND GROUNDNUT CHUTNY	RICE WITH CAULI FLOWER	CURD RICE AND CABBAGE	48	13.3
28	J.SHRAVANI	B.A 1ST YAER CHINNA ADIRALA	PURI AND POTATO KURMA	RICE WITH PUMPKIN CURRY	RICE AND BEAN CURRY	54	9.8
29	S.SHARANY A	BZCA 3RD YAER JADCHERLA	IDLY AND GROUNDNUT CHUTNY	POTAPO AND RICE	RICE/ CURD LEAFY VEGETABLE S	42	16.7
30	M. VIJAYA LAXMI	B.A 3RD YEAR MACHANPALLY	VADA /IDLY TOMATO CURRY	RICE BITTERDUARD	RICE WITH DAL AND CURD	39	9.1
31	B.NAVEEN KUMAR	B.A 1ST YEAR SHADNAGAR		RICE WITH CABBAGE	RICE/CURD RICE CHUTNY	55	16

32	RAJESHWAR REDDY	BZC 3RD YEAR JADCHERLA	IDLY/GROUND NUT CHUTNY	RICE AND SPINACH	RICE WITH RADDISH	64	17.7
33	S.KAVYA	BZC 3RD YAER JADCHERLA	DOSA/GROUNDNUT CHUTNY	RICE/BEETROOT	BEETROOT AND CARROT	33	14
34	K.ANUSHA	BZC 3RD YEAR KUCHARKAL	ROTI/ LEAFY VEGETABLES	CHAPATHI AND BEANS	RICE/ BEANS CURRY	38	10.2
35	P.ADHYA VARMA	BZC 2ND YEAR RANIPET	IDLY/GROUND NUT CHUTNY	RICE / POTATO	AMARANTHUS MEETHI CURRY	56	10.4
36	V.SUDHEER	MZC 3RD YEAR CHILUR	PURI/ TOMATO CURRY	RICE/BEANS	BEETROOT AND CARROT CURRY	63	17.3
37	E. SANTHOSH REDDY	BZC 3RD YEAR EKVAIPALLY	UPMA/ POTATO	RICE AND POTATO CURRY	RICE/CHAPATHI CHICKEN	44	12.1
38	K. KRISHNAVENI	MZC 3RD YEAR SINGAM DHODI	RICE AND DAL	RICE AND BRINJOL CURRY	RICE AND BEANS	38	8.9
39	LADIYA ROSE	MZC 2ND YEAR JADCHERLA	RICE AND SPINACH	ONION/TOMATO CURRY	RICE/LEAFY VEGETABLES	53	12.3
40	K.VINITHA BAI	MZC 3RD YEAR JADCHERLA	PURI/ TOMATO CURRY	RICE CHAPATHI CHICKEN	RICE AND CHICKEN	43	15.1
41	DHANUNJAY REDDY	B.COM 1ST YEAR TIMMAJIPET	UPMA /CHUTNY	RICE /BRINJOL	RICE AND TOMATO ONION	60	14.1

42	B.SRINU	B.COM 3RD YEAR JADCHERLA	VODA/IDLY CHUTNY	RICE/ CABBAGE	RICE /CHAPATHI CHICKEN	63	15
43	A.JAYASRI	BZCA 3RD YEAR JADCHERLA	LEMON RICE	RICE /BEETROOT	RICE/BEETROOT	39	13.7
44	SRAVANTHI	MZC 3RD YEAR GOLLAPLLY	ROTI/ DAL SPINACH	RICE/BENIS	RICE/BENIS CURRY	39	12.9
45	SAI SHIVA	B.COM 3RD YEAR MAHABUBNAGAR	DOSA/ CHATNY	RICE/CAULIFLOWER	RICE /CHAPATHI CAULIFLOWER	50	11.4
46	A.RAJESHWAR GOUD	B.COM 3RD YEAR CHENNAMPALLY	PURI/POTATO CURRY	RICE AND CABBAGE	RICE AND CABBAGE CURRY	53	14.1
47	K.ASHWINI	MZC 3RD YEAR DHODLAPALLY	CHAPATHI WITH CUCUMBER	RICE AND BOTTLE GUARD	RICE AND BOTTLE GUARD	39	11
48	YUGENDER REDDY	MZC 3RD YEAR BURGUL	FRIED RICE /SPINACH	RICE / CHICKEN	RICE/ CHICKEN	68	16.8
49	TAZAINA MAHUEEN	MZC 3RD YAER JADCHERLA	UPMA /CHILLY POWDER	RICE / CAULI FLOWER	RICE/ CAULIFLOWER	74	10.7
50	P.ASHOK	MZC 3RD YEAR JADCHERLA	CHAPATHI /POTATO CURRY	RICE/ DRUM STICK DAL	RICE AND CHICKEN	54	17.4

CONCLUSION

CHAPTER-5

As an above noted, it is of vital importance to reduce the prevalence of anemia word wide and in Ghana specifically, and the most impactful solutions will e those tailored to individual populations. This study highlights the truth of this concept. Effective solution to the global epidemic of anemia should be tailored not only from region to region or country to country ,but to individual populations with in those countries. Despite the nation's relatively small geographic size, our data Show a marked difference in anemia Prevalence b/w Some the groups studied Within Ghana This has shown to for other nutrition -related as well. The low levels this population may be be true health issues. of hemoglobin indicative in low intake, but could also be indicative of poor diet quality overall. In addition to anemia including including IDA, Ghanaians are at dist for a number of nutritional be deficiencies and diseases, including calcium and B-vitamin deficiencies as well as type 2 diabetes; yet studies have shown that there is no "One -size-fits-all" approach to alleviating these problems. alutrition education initiatives aimed at increasing Consumption of locally available foods rich in non and Vitamin C. Cand other mieso -nutrients that are lacking Should be undertaken to in diets) empower local population and decrease prevalence of Tron deficiency in Ghana. the the anemia in Ghana That Sarucy of HB value of student which about consuption of vegetables which most of the Student which they Sammy good in themoglobin value and most of the Boys are good percentage of 50 student

25 boys

25 girls

out of 25 boys the 19 boys have a go average hemoglobin value.

which only 6 boys have below average hemoglobin value.

but girls are which out of 25 girls which have 12 girls have average hemoglobin value.

that 10 out of 25 girls 13 girls have below average hemoglobin level

	Average	above average	Below average	total
Boys	16	2	67	25
Girls	8	4	13	25

out of 25 girls they have only 30% of girls having average hb value and 10% of girls having above average HB value and most of 60% of girls have below average of HB value and they all are have less HB value of another some health issues and they are irregular of vegetable consumption

then out of 25 boys they have 70% of boys having average HB value and only 25% of boys which have below average HB value and which have only 5% of above average HB value

	Average%	Below average%	Above average%	total
Boys	70%	25%	5%	100%
Girls	30%	60%	10%	100%

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