



Dietary Practices, Lifestyle Patterns and Nutritional Status of Emerging Male Adults in Different Living Arrangements

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Abstract

Emerging adulthood is a unique developmental period when many individuals are attending college, and their autonomy and self-sufficiency are increasing. Enrolment to higher education impacts the living arrangements of emerging adults contributing to a high-risk time for adverse health behaviours. The present study determined and compared the dietary practices, lifestyle patterns and nutritional status of emerging male adults (18-25 years) in different living arrangements. A total of 75 emerging males; 25 each living at home, in on-campus hostels, and in off-campus rented accommodations constituted the study sample. Data were gathered from the participants using an interview-cum-questionnaire schedule and a two day 24 hour diet recall method. Anthropometric measurements were also recorded. Findings revealed that higher percentage of participants living in hostels participated in outdoor games frequently, had regular meals and better mean nutrient intake as compared to participants living at home or in rented accommodations. A significant difference among the three groups was observed for the mean intake of energy, protein, carbohydrate, calcium, and riboflavin. Higher percentages of participants living at home and in rented accommodations were classified as overweight or obese as compared to those living in hostels, though the difference was not statistically significant. It could be concluded that living in hostels under some adult supervision in the form of hostel authorities provided the much needed independence as well as control in the correct dose to the emerging adults, to become responsible adults and develop healthy dietary and lifestyle practices.



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Introduction

Emerging adulthood is typically defined as ages 18-25 years and is a unique developmental period when

young people's independence and self-sufficiency are increasing¹. Here, an individual is not dependent like a child or responsible like an adult but rather

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somewhere in between. The three criteria which are important markers of reaching adult status are accepting responsibility for oneself, making independent decisions and becoming financially independent, all of which are attained in the course of emerging adulthood^{2,3}. In developing countries, emerging adulthood is often experienced in urban areas but rarely in rural areas. This is the age where many individuals are attending college, which then becomes a key transitional period¹. According to Greaney *et al.*,⁴ there is greater lifestyle freedom in emerging adulthood than ever before.

Every year a large population of students enrol in college for higher education courses; this makes many adults leave their homes and make a new living arrangement in the city from where they are pursuing higher education⁵. In such cases, they tend to either live in rented accommodations on sharing or non-sharing basis, or in the hostels of Institutes where they are studying. Many of the emerging adults are moving away from their parental homes for the first time to live in hostels or paying guest/rented accommodations. Compared with living at home or in on-campus hostels, independent apartment living offers the greatest freedom from parents and other adult authorities. With changes in their living arrangements, they have to fend for themselves and adapt to the new environments. Previous researches have indicated that living arrangements influence lifestyle factors such as food choices, nutrient content of the diet, alcohol consumption, smoking, and dieting⁶⁻⁹. Due to independent living, good dietary habits decline¹⁰; and poor dietary habits often tend to get worse¹¹. Dietary practices established during college are likely to be maintained for life and will impact the future health of the college student¹². According to Yusko *et al.*,¹³ rates of heavy alcohol use, tobacco use, and illicit substance use peak between the ages of 18 and 25. Brunt and Rhee¹⁴ reported that students who lived off-campus consumed more alcohol and smoked as compared to those students who lived on-campus or with parents.

The new found independence of emerging adults may have an impact on their eating habits and lifestyle patterns, consequently affecting their dietary intakes and nutritional status. It has also been noticed that as emerging adults begin to lead independent

lives outside the previous constraints of their family homes, the health behaviours followed during this period may set the stage for establishing long-term behaviours that have an important impact on lifetime disease risk¹⁵⁻¹⁷, as many of them are responsible for their own meal provision and food acquisition for the first time in their lives. Though some research has been done earlier on the dietary intakes and nutritional status of college students living at home and in on-campus hostels in India; there are very few studies that have focused on the effects of different living arrangements (on-campus, off-campus, and living with parents) of emerging adults. The present study was, therefore, undertaken to assess and compare the dietary practices, lifestyle patterns and nutritional status of emerging male adults (18-25 years) in different living arrangements i.e. living at home, living in on-campus hostels, and living in off-campus rented accommodations.

Materials and Methods

The present study was carried out in the National Capital Region of India. Using purposive sampling technique, a total of 75 emerging adult males in the age group of 18-25 years; 25 males each living at home with family, living in on-campus hostels, and living in rented accommodations were identified to constitute the study sample. The inclusion criteria was that the males should be studying in college or any other educational institute, and should be unmarried. Males who lived in paying guest accommodations where food was being provided or those who were working were not included in the study. Informed consent was taken from the identified males before including them as study participants and ethical procedures were followed for data collection.

A well-structured questionnaire-cum-interview schedule was prepared with methodological procedure which included questions regarding general profile, dietary practices and lifestyle patterns such as meal frequency, eating out, skipping meals, fasting, activity patterns, smoking, drinking etc. The questionnaires for participants living in hostels and in rented accommodations also contained a few additional questions specific to their living arrangements. Dietary intake data were gathered using 24-hour diet recall method for two days, one each for a working and non-working day. The

participants were asked to recall and report details of dishes consumed in each meal along with their portion sizes in household measures and ingredients used in them. Standardization of various food items/dishes was carried out to obtain information about the amounts of food ingredients used in different recipes and in different portion sizes. Information obtained from the participants was translated into raw weights of food ingredients using standardized recipes. The mean intake of energy and various nutrients was then calculated for participants in the three study groups using the Indian food composition database¹⁸ and compared with the recommended dietary allowances (RDA) for the same for adult sedentary males¹⁹. Anthropometric measurements such as weight and height were recorded for all the participants. Based on these measurements, their body mass index (BMI) was determined and the BMI classification given by Misra *et al.*,²⁰ was used to categorize the participants as obese, overweight, normal and underweight.

Data obtained from the participants were subjected to qualitative and quantitative analysis with the help of Statistical Package for Social Sciences, SPSS version 16.0. The frequency and percentages were

calculated for general profile, lifestyle patterns, dietary practices and BMI. A significant difference in these aspects between the three study groups of emerging male adults in different living arrangements was determined using the Chi square test. Mean and standard deviations were calculated for nutrient intakes and anthropometric variables. ANOVA and Tukey's HSD test were used to assess the significant difference between the nutrient intakes of three groups of emerging male participants.

Results and Discussion

The male participants living at home have been referred to as HOM group, participants living in on-campus hostels as HOS group, and participants living in rented accommodations as RA group.

General Profile

The participants in the study were between ages 18-25 years; and the mean age of RA group participants at 22.9±1.1 years was significantly higher as compared to participants from HOM and HOS groups who had a mean age of 21.5±1.2 and 21.9±1.3 years respectively. Data on general profile of the participants have been presented in Table 1.

Table 1: General Profile of the Participants

Parameter/ Category	HOM (n=25)	HOS (n=25)	RA (n=25)	χ^2
Education				
Under Graduate	15(60)	13(52)	2(8)	34.8NS
Post Graduate	9(36)	12(48)	9(36)	
Coaching	1(4)	0(0)	14(56)	
Time spent in living arrangement				
12–14 hours	9(36)	7(28)	8(32)	1.90NS
>14–16 hours	10(40)	12(48)	8(32)	
>16–18 hours	6(24)	6(24)	9(36)	
Monthly Family Income (Rupees)				
25,000–<50,000	6(24)	8(32)	6(24)	4.56NS
50,000–<1,00,000	11(44)	6(24)	11(44)	
≥1,00,000	8(32)	11(44)	8(32)	
Monthly Pocket Money (Rupees)				
≤5,000	21(84)	12(48)	2(8)	31.80*
5,001–10,000	4(16)	9(36)	12(48)	
>10,000	0(0)	4(16)	11(44)	
Satisfied with current living arrangement				
Yes	21(84)	17(68)	21(84)	2.54NS
No	4(16)	8(32)	4(16)	

Figures in parentheses denote percentages; *Significant at $p \leq 0.05$; NS:Not Significant

Maximum percentages of participants from HOM and HOS groups were enrolled in undergraduate courses while maximum from RA group were enrolled in coaching institutes for preparing for competitive exams. The highest percentage of participants from RA group spent maximum time, i.e. more than 16 to 18 hours, in their living arrangement as they did not spend much time in leisure or other activities and headed back to their accommodations after their coaching classes. The monthly family income of two-thirds of participants in all the three groups was more than Rupees 50,000/-. Majority of participants (84 %) staying at home received a comparatively low pocket money of Rupees 5000/- per month as compared to their counterparts from HOS and RA groups who received higher amounts as they had to fend for themselves in many aspects of daily living. About 68 % participants from the HOS group were satisfied with their current living arrangements as compared to a higher percentage (84 % each) of participants from the other two groups.

Lifestyle Patterns

Data on lifestyle patterns of the study participants have been presented in Table 2. Majority of participants from the three study groups slept for an adequate amount of about 7 to 9 hours daily. Maximum percentages of subjects from RA (96 %) and HOM (76 %) groups spent about 6 to 8 hours daily doing occupational activities related to their studies. In the hostel, because of presence of other batch mates, the environment sometimes compels

either everyone to study more or enjoy more so not much difference was seen among the subjects who spent different amounts of time in occupational activities. Higher percentages of participants from the HOM and RA groups reported that they performed exercises such as jogging and calisthenics including push-ups, sit-ups, stretching, jumping etc, however, their weekly frequency and duration of performing such exercises was low as compared to the HOS group. Nearly 80 % of the HOS group participants reported playing outdoor games like cricket, football, basketball and badminton more regularly as they had easy access to playgrounds and lawns in their hostel campus. Moreover, as most outdoor games were played in teams, HOS group participants could have easy access to their hostel mates and play with them. Only about half the subjects from RA group reported that they played outdoor games. A similar finding was also reported by Lupi *et al.*,²¹ in their recent study on undergraduate university students where students living alone dedicated less time to sports.

A significantly high percentage of RA group participants consumed alcohol as compared to the others, while smoking was reported by equal percentages of participants from HOS and RA groups due to greater independence and freedom from parental control. Studies have reported that that drinking and smoking was more common among college students who lived in residence halls or independently than among those living at home^{14,22-23}.

Table 2: Lifestyle Patterns of the Participants

Parameter/ Category	HOM (n=25)	HOS (n=25)	RA (n=25)	χ^2
Slept per day				
5 - <7 hours	2(8)	1(4)	0(0)	1.74NS
7 - <9 hours	22(88)	20(80)	23(92)	
9 - 11 hours	1(4)	4(16)	2(8)	
Occupational activities per day				
6 - <8 hours	19(76)	12(48)	24(96)	14.86*
8 - 10 hours	6(24)	13(52)	1(4)	
Performed exercise				
Yes	14(56)	9(36)	17(68)	5.25NS
No	11(44)	16(64)	8(32)	
Played outdoor games				
Yes	14(56)	20(80)	13(52)	4.90NS
No	11(44)	5(20)	12(48)	
Consumed alcohol				
Yes	5(20)	14(56)	21(84)	20.68*
No	20(80)	11(44)	4(16)	
Smoked cigarettes				
Yes	5(20)	11(44)	11(44)	4.16NS
No	20(80)	14(56)	14(56)	

Figures in parentheses denote percentages; *Significant at $p \leq 0.05$; NS:Not Significant

Dietary Practices

As presented in Table 3, data on dietary practices revealed that more than half of the participants in the HOM group were vegetarians while higher percentages of participants in the other two groups were either non-vegetarians or ovo-vegetarians. Highest percentage of participants from HOS group (44 %) had regular meal timings compared to their counterparts at home and in rented accommodations as they were being provided meals in the hostel mess at fixed hours. Maximum percentage of participants from HOM (56 %) and RA (44 %) groups had three meals, while those from HOS group (68 %) had four or more meals daily. About 60 % participants from all three groups reported that they skipped meals regularly, mainly breakfast or lunch due to rigid college/coaching hours and class timings, non-availability of food of choice, and lack of appetite. Choi and Lee²⁴ in their study on the relationship of college students' residence to meal skipping also reported that residence status did not influence meal skipping, and poor dietary practices among this population were likely to be due to time constraints.

Only a small percentage of participants from all three groups observed fasts mainly due to religious reasons. Maximum participants from the three study groups reported to be eating out either once or twice a week, mostly in the company of their friends; maximum percentages also consumed fried foods just once a week. One to three cups of tea or coffee were consumed daily by about 60 % participants from the three groups. All participants reported consumption of convenience foods; and consumption of items such as instant soups and noodles, frozen foods, ready-to-eat foods, chips, namkeens, and juices was higher among RA group; the difference however was not statistically significant among the three groups. A study by Ansari *et al.*,²⁵ on University students in four European countries also reported that moving out from parental homes was not accompanied by a significant increase in consumption of fast foods, snacks, or sweet consumption by the students.

Participants from HOS and RA groups gave some additional information which was specific for their living arrangements. All participants in HOS group had similar hostel mess timings that provided 4 meals

per day. If any meal was missed by the participant, the hostel did not compensate for it but allowed the participants to prepare Maggi, egg, tea/coffee etc. in their hostel rooms. About three-fourths of the HOS subjects (76 %) reported dissatisfaction about food served in the hostel mess due to unhygienic cooking and serving areas, non-satisfactory taste, inconsistency of cooking method, improper menu combination and limited food choices available to them. Majority of the RA group participants were satisfied and did not feel burdened about their food-related responsibilities. About 56 % of them reported that two meals were cooked in a day which included lunch and dinner; while 22 % mentioned that only one meal was cooked in a day which was consumed for both lunch and dinner, as the hired help/cook came to their residence only once in a day; another 22 % participants reported that breakfast, lunch and dinner were prepared daily at their residence. Both HOS and RA group participants visited local friends or relatives to have home cooked food once in a while.

Nutrient Intake

Table 4 gives the data on mean daily nutrient intake of the participants in the three study groups. It was found that the mean intake of energy, carbohydrates, vitamin A, riboflavin and niacin was lower than the recommended dietary allowances for sedentary adult man¹⁹ for participants in all the three groups while the intake of protein, total fat, calcium, vitamin C, thiamine and vitamin B₁₂ was higher. Mean iron intake of HOS group was nearly similar to the RDA but was lower for the other two groups. Statistically significant differences were found among the three study groups for the mean intake of energy, protein, carbohydrates, calcium and riboflavin, with the intake being highest for the participants from HOS group. Similar results were reported in a study by Laska *et al.*,²⁶ wherein young adults living with their parents and those living on their own in rented apartments or houses exhibited the poorest dietary intakes while those living on college and university campuses reported the most favourable diet and meal patterns.

Anthropometric Profile

The mean weight, height and BMI of the participants have been presented in Table 5. Participants from HOM group had the highest mean weight and BMI, while the mean height was highest for participants

from HOS group. As depicted in Table 6, a higher percentage of participants from RA and HOM groups were found to be overweight and obese as compared to the participants from HOS group. However, there were no statistically significant differences

between the three study groups. These findings were consistent with the findings of Brunt and Rhee¹⁴ who reported that males who lived off-campus were more likely to be overweight or obese as compared to those who lived on-campus or with parents.

Table 3: Dietary Practices of the Participants

Parameter/ Category	HOM (n=25)	HOS (n=25)	RA (n=25)	χ^2
Type of food consumed				
Vegetarian	13(52)	5(20)	4(16)	11.71*
Non-vegetarian	10(40)	12(48)	16(64)	
Ovo-vegetarian	2(8)	8(32)	5(20)	
Regularity in meal timings				
Yes	7(28)	11(44)	10(40)	1.48NS
No	18(72)	14(56)	15(60)	
Meal Pattern				
2 meals a day	0(0)	3(12)	4(16)	6.94NS
3 meals a day	14(56)	5(20)	11(44)	
4 or more meals a day	11(44)	17(68)	10(40)	
Skipped Meals				
Yes	15(60)	15(60)	15(60)	0.00
No	10(40)	10(40)	10(40)	
Kept Fasts				
Yes	2(8)	4(14)	6(24)	1.41NS
No	23(92)	21(86)	19(76)	
Frequency of Eating Out				
Daily	1(4)	3(12)	2(8)	1.26NS
Once/twice a week	16(64)	18(72)	18(72)	
Once/twice a month	8(32)	4(16)	5(20)	
Frequency of Consumption of Fried Food				
Daily	2(8)	4(16)	8(32)	6.58NS
Weekly	18(72)	16(64)	10(40)	
Once in fortnight	3(12)	5(20)	7(28)	
Never	2(8)	0(0)	0(0)	
Daily consumption of tea/coffee				
None	7(28)	4(16)	3(12)	1.47NS
1 – 3 cups	15(60)	16(64)	16(64)	
More than 3 cups	3(12)	5(20)	6(24)	

Figures in parentheses denote percentages; *Significant at $p \leq 0.05$; NS:Not Significant

Table 4: Mean Daily Nutrient Intake of the Participants

Nutrient	RDA [∞]	HOM (n=25) Mean± SD	HOS (n=25) Mean± SD	RA (n=25) Mean± SD	F-Value
Energy (kcal)	2320	1995±177 ^a (1674–2405)	2210±278 ^b (1597–2602)	2072±243 ^{ab} (1586–2506)	5.24*
Protein (g)	60	63.2±16.4 ^a (49.0–81.0)	77.6±20.4 ^b (37.6–127.6)	72.5±15.7 ^{ab} (47.6–105.1)	5.50*
Total Fat (g)	30 en% [#]	69.7±10.7 (52.0–94.0)	77.9±13.9 (45.0–102.3)	70.9±15.3 (36.1–96.9)	2.72NS
Carbohydrates (g)	60 en% [#]	268.0±32.4 ^a (207.0–354.0)	294.8±46.3 ^b (197.4–388.1)	264.6±38.2 ^a (180.7–312.7)	4.39*
Calcium (mg)	600	813±144 ^a (541–1052)	839±143 ^a (499–1073)	641±151 ^b (389–954)	13.53*
Iron (mg)	17	15.6±2.7 (11.0–21.8)	17.3±4.0 (9.1–22.7)	15.8±3.5 (10.9–26.9)	1.80NS
Vitamin A (µg)	600	398±176 (159–975)	517±207 (221–894)	486±221 (104–843)	2.29 NS
Vitamin C (mg)	40	104±35 (44–188)	107±36 (55–190)	95±47 (34–188)	0.56NS
Thiamine (mg)	1.2	1.5±0.2 (1.0–1.9)	1.6±0.3 (1.1–2.3)	1.4±0.2 (0.9–2.2)	2.14NS
Riboflavin (mg)	1.4	1.3±0.3 ^{ac} (0.8–1.9)	1.3±0.2 ^{bc} (0.9–1.9)	1.1±0.3 ^a (0.6–2.0)	3.52*
Niacin (mg)	16	12.3±2.2 (8.4–16.1)	12.5±3.0 (6.3–17.4)	12.4±1.9 (8.5–15.9)	0.03NS
Vitamin B ₁₂ (µg)	1.0	1.2±1.0 (0.3–4.7)	1.6±1.0 (0.2–4.3)	1.7±1.3 (0.03–4.8)	1.43NS

Figures in parentheses denote range; #energy percent

∞Recommended dietary allowances for sedentary adult man¹⁹

Means with different superscripts are different as tested by ANOVA and Tukey's HSD (*Significant at p≤0.05; NS:Not Significant)

Table 5: Mean Weight, Height and BMI of the Participants

Anthropometric Parameters	HOM (n=25)	HOS (n=25)	RA (n=25)	F-Value
Weight (kg)	75.7±7.4 (60.9-85.3)	71.5±6.4 (58.5-85.1)	73.4±6.0 (60.2-90.3)	1.15NS
Height (cm)	175.8±3.8 (169.7-182.6)	176.1±3.5 (170.1-182.1)	175.8±4.6 (165.7-180.9)	0.05NS
BMI (kg/m ²)	24.1±1.6 (20.2-26.2)	23.0±1.6 (20.0-26.2)	22.9±4.3 (18.5-27.7)	1.45NS

Figures in parentheses denote range: NS: Not Significant

Table 6: Distribution of Participants according to BMI Classification²⁰

BMI (kg/m ²)	HOM (n=25)	HOS (n=25)	RA (n=25)
Normal (18.0-22.9)	10(40)	14(56)	7(28)
Overweight (23.0-24.9)	12(48)	9(36)	14(56)
Obese (>25.0)	3(12)	2(8)	4(16)

Figures in parentheses denote percentages; $\chi^2=2.69$, Not Significant

Conclusion

From the findings of the present study, it could be concluded that living arrangements of emerging males influenced their dietary practices, lifestyle patterns and nutritional status. Emerging adults living in hostels seemed to have better involvement in outdoor sports as well as occupational activities related to studies due to easy accessibility to related facilities. They had more regular dietary patterns as they were dependent on meal service at fixed timings which they usually did not miss. They also showed higher intakes of important nutrients and were less likely to be overweight or obese as they had stricter physical activity and dietary regimes and a greater motivation to be fit, being surrounded by their peers most of the time. Though the emerging males living in rented accommodations felt more responsible and independent, the lifestyle practices they sometimes acquired due to lack of adequate parental supervision led to development of adverse health-risk behaviours which could impact their entire lives. Vices such as drinking and smoking were more common among males living on their own. Though home environment may promote some positive lifestyle patterns and protect from risk behaviours like smoking and drinking, this may sometimes become too stifling for the emerging males who are in the

transitional period of becoming independent and self-sufficient. Living in hostels seemed to provide the right balance between a totally independent life in rented accommodations and a controlled life at home under parental supervision, by providing autonomy as well as control in the correct dose under some adult supervision in the form of hostel authorities. It seemed to be exactly the kind of environment that the emerging adults needed in this unique developmental phase of their lives to become responsible adults and develop healthy dietary and lifestyle practices.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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None

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