2026 Volume: 02 Issue: 06 www.ijrpa.com ISSN 2456-9995 Research Article

International Journal Research Publication Analysis

Page: 01-12

COMPARATIVESTUDYONPROTEININTAKEIN VEGETARIAN VS NON-VEGETARIAN DIETS

Sadia Khatoon*[1], P. Divyaroopa[2], B. Deepika[3]

[1]M.Sc. Nutrition and Dietetics, Department of Nutrition, Kasturba Gandhi Degree & PG College for Women, Affiliated to Osmania University, Secunderabad, Telangana, India.

[2]Assistant Professor, Department of Nutrition, Kasturba Gandhi Degree & PG College for Women, Affiliated to Osmania University, Secunderabad, Telangana, India.

[3]HOD, Statistics, St Ann's college for women, Mehdipatnam, Hyderabad, Telangana, India.

Article Received: 18 May 2026
Article Revised: 06 June 2026
Published on: 26 June 2026

***Corresponding Author: Sadia Khatoon**
M.Sc. Nutrition and Dietetics, Department of Nutrition, Kasturba Gandhi Degree & PG College for Women, Affiliated to Osmania University, Secunderabad, Telangana, India.

DOI: https://doi-doi.org/101555/ijrpa.8454

ABSTRACT

Growth,tissuehealing,musclemassmaintenance,andotherphysiologicalprocessesalldepend on protein, an essential macronutrient. Protein intake is significantly influenced by dietary habits,especiallyforthosewhofollowvegetarian andnon-vegetariandiets.Thecurrentstudy sought to determine the factors influencing protein-related dietary behaviors and to compare thepatternsofprotein consumption among female collegestudents whowerevegetarians and non-vegetarians. 200 female students between the ages of 18 and 25 participated in a comparative cross-sectional study. The study included 100 vegetarians and 100 non vegetarians. A standardized questionnaire that evaluated eating patterns, meal frequency, breakfastconsumption,intakeoffoodshighinprotein,andfoodchoicesrelatedtoproteinwas usedtogatherdata.Descriptivestatistics,theChi-squaretest,MultipleLinearRegression,and One-WayANOVAwere among the statistical analyses carried out using SPSS software.

The results showed that while fish and soy products were consumed less frequently, the majorityofparticipantsatethreemealsaday(71.0%)andfrequentlyconsumeddairyproducts. Just 30.5% of respondents purposefully chose foods based on protein content, and over half (46.0%)seldomincludedfoodshighinproteininbreakfast.Age,dietarypattern,andanumber of protein intake behaviors were found to be significantly correlated ($p < 0.05$).Age, dietary pattern,mealfrequency,breakfasthabits,intentionalselectionofproteinrichfoods,andusage of

protein supplements all had a significant impact on protein intake ratings, according to multiple linear regression analysis (R2 = 0.260, p < 0.001). Meal frequency significantly affected protein intake scores, according to a one-way ANOVA (F = 5.450, p = 0.005). According to the study's findings, female college students' moderate protein intake was influencedby their age, mealfrequency,anddietaryhabits.Youngwomen'sdietary adequacy may be improved by nutrition education programs that encourage balanced protein consumption and raise awareness of various protein sources.

KEYWORDS: Proteinintake, Vegetariandiet, Non-vegetariandiet, Female college students, Dietary patterns, Protein-rich foods.

INTRODUCTION

Protein is an essential macronutrient required for growth, tissue repair, enzyme synthesis, hormone production, immune function, and maintenance of body tissues. Throughout the life cycle, it is essential for maintaining general health and physiological processes. Adequate protein intake is necessary for maintaining muscle mass, promoting metabolic processes, and ensuring optimal physical and cognitive performance[1].

Dietary patterns are important determinants of protein intake. Vegetarian diets primarily rely onplant-basedfoodssuchascereals,pulses,legumes,nuts,seeds,fruits,vegetables,anddairy products,whereasnon-vegetariandietsincludeanimal-basedfoodssuchasmeat,poultry,fish, andeggs.Bothdietarypatternspossessdistinctnutritionalcharacteristicsthatinfluenceprotein quality, amino acid composition, and overall nutrient intake[2].

Vegetarian diets have gained increasing attention because of their potential health, environmental, and ethical benefits. Studies have reported that well-planned vegetarian diets are associated with lower risks of cardiovascular diseases, obesity, hypertension, type 2 diabetesmellitus,andcertaincancers[3,4].Additionally,growingconsumerawarenessregarding sustainable food systems has contributed to the increasing adoption of plant-based dietary patterns[5].

Vegetarian diets provide health advantages, but if they are not well planned, they may pose nutritionalproblems.Inadequateconsumptionofprotein,vitaminB12,iron,zinc,calcium,and omega-3 fatty acids are among the specific issues[6,7]. Consuming a variety of plant protein sources is crucial for maintaining nutritional adequacy and ensuring sufficient intake of key amino acids, according to numerous studies[8,9].

Becausetheycontainalloftheessentialaminoacidsinsufficientamountsandaremoreeasily

digested than many plant proteins, animal proteins are typically regarded as high-quality proteins5. On the other hand, overindulgence in some animal-based meals, especially processed meats, has been associated with negative health consequences. Therefore, in order to obtain the best possible nutritional balance, both vegetarian and non-vegetarian eating patterns require careful preparation[10].

Young adulthood is a critical stage for the development of lifelong dietary habits. College studentsoftenexperiencechangesinfoodchoicesandmealpatternsduetoacademicdemands, social influences, and lifestyle transitions. Female college students areparticularly vulnerable to nutritional inadequacies because of increased physiological requirements and irregular eatingbehaviours[11,12].Understandingproteinintakepatternsamongthispopulationistherefore important for developing effective nutrition education strategies.

Although several studies have compared vegetarian and non-vegetarian dietary patterns, limited information is available regarding protein intake behaviours among young female college students in the Indian context[13]. Therefore, the present study was undertaken to compareproteinintakepatternsamongvegetarianandnon-vegetarianfemalecollegestudents and to identify factors associated with protein-related dietary behaviours.

Studies repeatedly show that plant-based proteins use less water, need less land, and produce less greenhouse gasses than animal-based proteins. Although some studies point out that industrial processing ofplant-based meat substitutesrequires energy and that animal products offer greater nutrient density, switching to plant proteins has significant sustainability potential.[14]

The absence of interventional trials evaluating vegetarian or vegan diets without supplements throughoutinfancyistheresearchgap.Thesafetyandsufficiencyofthesedietsforgrowthand neurodevelopment are uncertain because the majority of the current evidence is based on observations of specific nutrient deficits. Furthermore, it is unknown how supplemental vegetarian or vegan diets affect young children's risk of contracting infectious diseases. Generally speaking, controlled studies are needed to evaluate the effects of plant-based diets during this critical developmental time[15].

MATERIALSANDMETHODS

Study Design

The present study employed a comparative cross-sectional research design to assess and compareproteinintakepatternsamongvegetarianandnon-vegetarianfemalecollegestudents. The study was conducted over a specified period using a structured questionnaire to evaluate

dietary habits and protein consumption practices.

StudyPopulationandSample Size

The study population consisted of female undergraduate and postgraduate students aged between 18 and 25 years.A total of 200 participants were included in the study, comprising 100vegetariansand100non-vegetarians.Participantswereselectedbasedontheirwillingness to participate and fulfilment of the inclusion criteria.

InclusionCriteria

- Femalestudentsaged18–25years.
- Undergraduateandpostgraduatestudents.
- Participantsfollowingeitheravegetarianornon-vegetariandiet.
- Participantswillingtoprovideinformedconsent andcompletethe questionnaire.

ExclusionCriteria

- Malestudents.
- Individualsbelow18yearsorabove25yearsofage.
- Participantswithincompletequestionnaireresponses.
- Individualsfollowingtherapeutic or medicallyprescribeddietsthatcouldinfluence normal dietary intake patterns.

SamplingTechnique

A convenience sampling technique was employed for participant selection. Eligible students were approached and invited to participate in the study. Participation was voluntary, and informed consent was obtained prior to data collection.

DataCollectionTool

Data were collected using a pre-structured questionnaire developed to assess demographic characteristics, dietary habits, meal patterns, and protein intake practices. The questionnaire consistedofitemsrelated toage,yearofstudy,placeof residence,dietarypattern,durationof dietary practice, meal frequency, breakfast consumption, intake of protein-rich foods, consumption of protein supplements, and awareness regarding protein-rich food choices.

DataCollectionProcedure

Participants were informed about the objectives of the study before administration of the questionnaire.Thequestionnairewasdistributedelectronicallythrough GoogleForms. Responseswerecollectedandcompiledforfurtheranalysis.Confidentialityandanonymityof the

participants were maintained throughout the study.

StudyVariables

The independent variables included age, dietary pattern, meal frequency, breakfast habits, protein-rich breakfast consumption, intentional selection of protein-rich foods, frequency of protein-richfoodintake,andproteinsupplementconsumption.Thedependentvariablewasthe Protein Intake Score, which was derived from responses related to protein-rich food consumption patterns.

StatisticalAnalysis

Data were entered into Microsoft Excel for coding and tabulation. Statistical analysis was performedusingStatisticalPackageforSocialSciences(SPSS)software.Descriptivestatistics including frequency and percentage distributions were used to summarize demographic characteristics and dietary practices.

The Chi-square test was applied to determine associations between demographic variables, dietary pattern, and protein intake behaviours. Multiple Linear Regression analysis was conducted to identify factors influencing Protein Intake Score among the participants. One-WayAnalysisofVariance(ANOVA)followedbyTukeyHSDposthoctestwasperformedto compare mean Protein Intake Scores across meal frequency groups.

Statisticalsignificancewasconsidered atap-valueoflessthan0.05.

RESULTS AND DISCUSSION

A total of 200 female college students aged 18–25 years participated in the study. The participants represented both undergraduate and postgraduate levels of education and were equally distributed between vegetarian and non-vegetarian dietary groups. The findings provideinsightsintothedietaryhabits,proteinintakepatterns,andfactorsinfluencingprotein consumption among the study population.

Socio-DemographicCharacteristicsofParticipants

The socio-demographic profile of the respondents revealed that the majority of participants (66.5%) belonged to the 22–25 years age group, while 33.5% were between 18–21 years of age. All respondents were female students. More than half of the participants (57.5%) were postgraduate students, followed by third-year undergraduate students (27.0%). Most respondents(80.5%)residedwiththeirfamilies,whereasonly19.5%livedinhostels.Thestudy population was equally distributed between vegetarian and non-vegetarian dietary groups, enabling a balanced comparison of dietary practice

Table1 Socio-demographic Characteristics of Participants.

Variable	Category	Frequency	Percentage(%)
Age	18–21 years	66	33
	22–25 years	134	67
EducationalStatus	Undergraduate	84	42
	Postgraduate	116	58
DietaryPattern	Vegetarian	100	50
	Non-Vegetarian	100	50
DurationofDietaryPractice	<1year	16	8
	1–3 years	48	24
	>3years	136	68

Figure1 Duration of Following Current Dietary Pattern Among Participants.

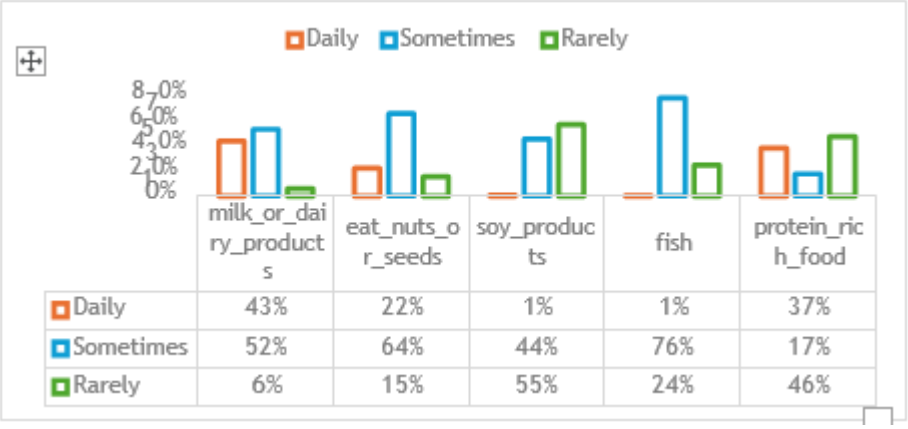
Figure1showsthatmostparticipants(68%)hadfollowedtheircurrentdietarypatternformore thanthreeyears,while20%hadfolloweditforlessthanoneyearand12%for1–3years.This indicates long-term adherence and stable dietary habits among the majority of respondents, which may influence their protein intake patterns.

Protein-RichFoodConsumptionPatterns

Protein-rich food intake was moderate among participants. More than half of the respondents consumed pulses and lentils once per week (51.5%), while only 20.0% consumed them daily. Dairyproductswerethemostcommonlyconsumedproteinsource,with42.5%reportingdaily consumptionand51.5%consumingthemoccasionally.Nutsandseedsweremainlyconsumed occasionally(63.5%),withonly21.5%consumingthemdaily.Soyproductsshowedthelowest intake,with55.0%consumingthemrarelyandonly1.0%consumingthemdaily.Amongnon-vegetarian protein sources, eggs and meat weremostly consumed 2–3times per week (28.0% and 33.5%, respectively), whereas fish was consumed only occasionally by 75.5% of participants.Overall,participantsreliedprimarilyondairyproducts,pulses,eggs,andmeatas their main protein sources.

Table2 Protein-RichFoodConsumptionpattern.

ProteinSource	Observation
Dairy Products	Mostfrequently consumed
Pulsesand Legumes	Frequentlyconsumed
Eggs	Moderatelyconsumed
MeatandPoultry	Commonamong non-vegetarians
Fish	Lowconsumption
Soy Products	Leastconsumed



	milk_or_dairy_products	eat_nuts_or_seeds	soy_products	fish	protein_rich_food
Daily	43%	22%	1%	1%	37%
Sometimes	52%	64%	44%	76%	17%
Rarely	6%	15%	55%	24%	46%

Figure2 ConsumptionPatternofProtein-RichFoods.

Nearlyhalfoftheparticipants(46.0%)reportedrarelyincludingprotein-richfoodsinbreakfast, whereas only 37.0% consumed protein-rich breakfast foods daily. Furthermore, only 30.5% intentionally selected foods based on their protein content, while 34.5% reported not consideringproteincontentduringfoodselection.Thesefindingssuggestmoderateawareness regarding the importance of dietary protein among the study population. Halfoftherespondents(50.0%)consumedprotein-richfoodsonlyonceperday,whereasonly 4.5% consumed protein-rich foods more than three times daily. The majority of participants (85.5%)didnotconsumeproteinsupplements,indicatinglowrelianceonsupplementationfor meeting protein requirements.

Figure3 FrequencyofDailyProtein-RichFoodConsumptionAmongParticipants.

Thefindingshighlightthatalthoughparticipantsgenerallyfollowedregularmealpatterns,the frequency of protein-rich food intake was only moderate. Similar observations have been reported in previous studies, which suggest that young adults often fail to achieve optimal proteinintakebecauseofinadequatedietaryplanningandlimitedawarenessregardingprotein-rich food sources.

Association Between Demographic Variables, Dietary Pattern, and Protein Intake Behaviours

The Chi-square test was applied to examine the association between demographic characteristics, dietary pattern, and protein-related dietary behaviours.

Table3 Chisquareanalysis.

Test	Result
Chi-SquareAnalysis	SignificantAssociation(p<0.05)

Chi-squareanalysisrevealedsignificantassociationsbetweenageandpulse/lentilconsumption (p=0.001),intentionalproteinfoodselection(p=0.013),frequencyofprotein-richfoodintake (p = 0.006), and dietary pattern (p = 0.036). Age was also associated with dairy product consumption (p = 0.075) and inclusion of protein-rich breakfast (p = 0.085) at the 10% significance level. Dietary pattern showed significant associations with protein-rich breakfast consumption (p < 0.001), intentional protein selection (p = 0.005), main protein source (p = 0.045), pulse consumption (p < 0.001), soy product consumption (p = 0.001), egg, meat, and fish consumption (p < 0.001), and frequently consumed protein foods (p < 0.001). These findings indicatethat age and dietarypatternsignificantly influenceprotein intakebehaviours among female college students.

PredictorsInfluencingProteinIntakeScore

Multiple Linear Regression analysis was performed to identify factors influencing Protein Intake Score among the participant

Table4: MultipleRegressionAnalysisPredictingProteinIntakeScore

Parameter	Value
R^2	0.260
F-value	8.397
p-value	<0.001

The regression model demonstrated a moderate positive relationship between the predictor variables and Protein Intake Score (R = 0.510).The coefficient of determination (R^2 = 0.260) indicatedthatapproximately26.0%ofthevariabilityinProteinIntakeScorewasexplainedby the selected predictor variables. The adjusted R^2 value of 0.229 further confirmed the explanatory ability of the model after accounting for the number of predictors included.

TheANOVAresult for the regression model revealed an F-value of 8.397 with a significance value of p < 0.001, indicating that the model was statistically significant. The results suggest

that age, dietary pattern, meal frequency, breakfast habits, inclusion of protein-rich foods at breakfast,
intentional protein food selection, frequency of protein-rich food intake, and protein supplementusecollectivelycontributedtopredictingProteinIntakeScoreamongparticipants.

ComparisonofProteinIntakeScoresBasedonMealFrequency

One-WayANOVAwasconductedtocompareProteinIntakeScoresamongparticipantsbased on the number of meals consumed per day.

Table5: One-WayANOVAofProteinIntakeScoresbyMealFrequency.

Variable	F-value	p-value
Meal Frequency	5.450	0.005

One-Way ANOVA showed a significant difference in Protein Intake Scores based on meal frequency (F = 5.450, p = 0.005). Tukey HSD analysis revealed that participants consuming three meals per day had significantly higher Protein Intake Scores than those consuming two meals per day (p = 0.006), while no significant differences were observed between the other groups. These findings suggest that regular consumption of three meals per day may support better protein intake adequacy.

CONCLUSION

The current study, which examined protein intake patterns among vegetarian and non-vegetarianfemalecollegestudentsaged18to25,foundthatwhilemostparticipantsmaintained regular meal patterns, the total frequency of protein-rich food consumption was rather minor. Dairyproducts, lentils, eggs, and meat werefound to bethemost commonsources ofprotein; fish and soy products were consumed less frequently.Asizable portion of participants rarely included foods high in protein in their breakfast and showed little understanding of the purposefulselectionofmealshighinprotein.Significantcorrelationswerefoundbetweenage, dietary pattern, and various protein intake behaviors, indicating that these factors influence dietary choices and protein consumption patterns.

Multiple linear regression analysis revealed that the following factors were significant predictorsoftheProteinIntakeScore:age,dietary pattern,frequencyofmeals,breakfasthabits, inclusion of protein-rich breakfast, intentional selection of protein-rich foods, frequency of intakeofprotein-richfoods,anduseofproteinsupplements.Furthermore,peoplewhoatethree meals a day scored significantly better on protein consumption than those who only ate two,

according to a one-wayANOVA. Overall, the findings show that in order to improve dietary quality and protein-related dietary habits among young women, nutrition education programs thatpromoteregularmealconsumption,balancedproteinintake,andtheinclusionofavariety of foods high in protein are essential.

ACKNOWLEDGEMENT

The authors express their sincere gratitude to the Management, Principal, and Department of NutritionandDietetics, KasturbaGandhiDegree andPGCollegeforWomen,Hyderabad, for providing guidance, encouragement, and facilities to carry out the study successfully. The authors are also thankful to all the students who willingly participated in the research and provided valuable information for the completion of the study.

REFERENCES

1. Akram,M.,&Soonmin,H.(2024).Aclinicalreviewofprotein.AfricanJournalof Biomedical Research.https://doi.org/10.53555/AJBR.v27i4S.4007
2. Chalvon-Demersay,T.,Azzout-Marniche,D.,Arfsten,J.,Egli,L.,Gaudichon,C., Karagounis,L.G.,&Tomé,D.(2017).Asystematicreviewoftheeffectsofplant compared with animal protein sources on features of metabolic syndrome. The Journal of Nutrition, 147(3), 281–292. https://doi.org/10.3945/jn.116.239574
3. Dawczynski, C., Weidauer, T., Richert, C., Schlattmann, P., Dawczynski, K., & Kiehntopf, M. (2022). Nutrient intake and nutrition status in vegetarians and vegans in comparison to omnivores: The NuEva study. Frontiers in Nutrition, 9, 819106.https://doi.org/10.3389/fnut.2022.819106
4. Hargreaves,S.M.,Raposo,A.,Saraiva,A.,&Zandonadi,R.P.(2021).Vegetarian diet:Anoverviewthroughtheperspectiveofqualityoflifedomains.International Journal of Environmental Research and Public Health, 18(8), 4067.
5. Kenny,T.A.,Woodside, J.V., Perry, I. J., & Harrington, J. M. (2023).Consumer attitudesandbehaviorstowardmoresustainablediets:Ascopingreview.Nutrition Reviews, 81(12), 1665–1679. https://doi.org/10.1093/nutrit/nuad033
6. Key,T.J.,Appleby,P.N.,&Rosell,M.S.(2006).Healtheffectsofvegetarianand vegan diets. Proceedings of the Nutrition Society, 65(1), 35–41.
7. Kniskern, M.A., & Johnston, C. S. (2011). Protein dietary reference intakes may be inadequate for vegetarians if low amounts of animal protein are consumed. Nutrition, 27(6), 727–730. https://doi.org/10.1016/j.nut.2010.08.024

8. Lim,S.(2018).Eatingabalanceddiet:Ahealthylifethroughabalanceddietinthe age of longevity. Journal of Obesity and Metabolic Syndrome, 27(1), 39–45.
9. Mariotti,F.(2017).Plantprotein,animalprotein,andproteinquality.InVegetarian andPlant-BasedDietsinHealthandDiseasePrevention(pp.621–642).Academic Press.
10. McEvoy,C.T.,Temple,N.,&Woodside,J.V.(2012).Vegetariandiets,low-meat diets and health: A review. Public Health Nutrition, 15(12), 2287–2294. https://doi.org/10.1017/s1368980012000936
11. Neufingerl, N., & Eilander, A. (2021). Nutrient intake and status in adults consuming plant-based diets compared to meat-eaters: A systematic review. Nutrients, 14(1), 29.
12. Parker, H. W., & Vadiveloo, M. K. (2019). Diet quality of vegetarian diets comparedwith nonvegetarian diets:Asystematicreview. NutritionReviews, 77(3), 144–160. https://doi.org/10.1093/nutrit/nuy067
13. Pattar, S., Shetty, P., & Shetty, G. B. (2023). Impact of vegetarian versus non-vegetarian diet on health outcomes in male individuals: A comparative study. Advances in Integrative Medicine, 10(1), 1–7. https://doi.org/10.1016/j.aimed.2023.02.001
14. Pankaj,S.S.(2024).*Sustainablediets:Comparingtheenvironmentalandsocial impacts of vegetarian and non-vegetarian choices.* Biological and Life Sciences Forum, 38(1), 2. https://doi.org/10.3390/blsf2024038002
15. Simeone,G.,Bergamini,M.,Verga,M.C.,Cuomo,B.,D'Antonio,G.,Iacono,I. D., ... & Caroli, M. (2022). Do vegetarian diets provide adequate nutrient intake during complementary feeding?A systematic review. Nutrients, 14(17), 3591.