

Exploring Food Supplement and Protein Consumption Patterns among Gym-Goers in Pakistan

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ABSTRACT

Background of the study: This is qualitative research on the protein intake trend in gym enthusiasts of Pakistan and how it affects fitness performance based on social, economic, and marketing factors. The study illustrates dietary habits, cost-effectiveness, and temporary fitness goals while still focusing on preferring whole foods to supplements because of cost, health concerns, and a perceived lack of quality in the supplements.

Methodology: Regarding dietary preferences and influences, semi-structured, face-to-face interviews were conducted with 30 fitness enthusiasts from Karachi, Hyderabad, Sukkur, Lahore, Faisalabad, and Islamabad.

Results: Participants mainly selected natural proteins like legumes, eggs, and chicken because these are cheaper and culturally acceptable. Social media and fitness communities, such as trainers and peers, effectively determine choices. Fear of illegitimate supplements made this preference even more robust.

Conclusions: It points out the requirement for proper outreach and accurate information on protein intake via social networks and fitness communities. The findings serve as input for trainers, clients, and health experts in promoting healthy eating habits within the fitness industry in Pakistan.

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Introduction

In fitness and overall health, protein is a macronutrient that plays a critical role in muscle repair and growth, but that is poorly understood. Protein is the most common nutrient to surface in fitness conversations, even when other nutrients are essential. This focus has driven whether this is scientific or just a market trend in advertising protein foods (Garcia et al., 2022; Rollo et al., 2020). The World Health Organization guidelines suggest that a normal sedentary adult should consume 0.8 grams of protein per kilogram. In comparison, active strength training athletes should consume 1.2–2.0 grams of protein per kilogram of their body weight (Cruz-Jentoft et al., 2020).

Protein supplements like powders, bars,

and shakes in the market have gained much attention from the fitness industry because they claim it is easier to achieve protein intake by consuming protein supplement products (Mazzilli et al., 2021). However, using supplements has been determined to cause nutrient deficiencies and health threats (Vasconcelos et al., 2021).

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There is, therefore, a significant relationship between economic factors and protein intake (Ruano and Teixeira, 2020). Whole-food substitutions, which contain more nutrients and are cheaper, are still not adequately promoted (Aly et al., 2023). These disparities informed the need to work on the socio-economic determinants of fitness nutrition inequalities. Sociological aspects of proteins are essential for the sociocultural picture of food protein in countries like Pakistan (Sharif et al., 2024). Few studies have been conducted to determine the attitudes of the consumers of gyms in Pakistan toward natural protein as a substitute supplement or what influences the consumers' socio-economic status. Current research mainly focuses on protein's functions regarding muscle mass gain and weight loss. It does not pay much attention to its additional functions for health, including immunomodulation and anticancer effects (Kim et al., 2021). The following research will focus on the protein intake of gym enthusiasts and the proportion of proteins from natural food products and supplements. The identified results could enhance healthy eating habits and create a positive attitude towards exercise and nutrition among the multicultural population.

Research Objectives

1. To investigate the specific perceptions and practices related to protein consumption among gym-goers and its impact on their health and fitness outcomes.
2. To assess awareness of protein intake recommendations among gym-goers based on activity, age, and health.
3. To examine how marketing and social media shape perceptions of protein supplements among fitness enthusiasts.
4. To analyze gym-goers' understanding of balanced diets and the distinction between whole foods and supplements.
5. To explore economic factors affecting protein supplement consumption and access to affordable whole foods.
6. To assess awareness of protein metabolism limits and risks associated with excessive protein intake.
7. To investigate the impact of social networks on dietary practices related to protein among fitness enthusiasts.
8. To determine the effectiveness of nutritional education in addressing misconceptions about protein and supplements.

Research Question

1. What are the common perceptions among fitness enthusiasts regarding the role of protein in muscle growth and recovery?
2. How do gym-goers obtain their information about protein intake, and what is the influence of social media and marketing on their choices?
3. To what extent do fitness enthusiasts understand the concept of a balanced diet, particularly regarding the intake of macronutrients other than protein?
4. How do the dietary habits of gym-goers regarding protein supplementation compare to those who focus on whole-food protein sources?
5. What economic factors influence the decision to purchase protein supplements versus whole food sources among fitness enthusiasts?
6. How do gym-goers perceive the effectiveness and necessity of protein supplements for their fitness goals?
7. How do gym-goers obtain their information about protein intake, and what is the influence of social media and marketing on their choices?

8. How do gym-goers perceive the effectiveness and necessity of protein supplements for their fitness goals?

Literature Review

The Macronutrients of the Fitness Nutrition

It is important for human health and fitness to include the macronutrients of carbohydrates, fats, and proteins. Carbohydrates are important for energy in training, especially during high-intensity training, as they are stored as glucose, which muscles use (Rollo et al., 2020). Whereas obesity and insulin resistance due to high carbohydrate intake occur in Asians, who have higher body fat levels than Caucasians when they are at the same BMI. Fats are important for energy reserves, vitamin absorption and synthesis of hormones. Saturated fats in avocados reduce mortality risks, while trans fats, generally found in processed foods, increase cardiovascular disease risk (Maki et al., 2021). The human body uses proteins in muscle build and recovery, and athletes need up to 2 g of protein per kilogram of body weight because, differently from other individuals, the recommended amount is 0.8 g of protein per kilogram of body weight for the average person (Kerksick et al., 2021). Present macronutrient guidelines include carbohydrates 45-65%, fats 20-35% and proteins 10-35% (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2020).

Role of Proteins in the Body

Proteins are polymers of amino acids, namely structural, biochemical, hormonal and enzymatic functions. The above 20 amino acids are conditionally or non-essential (Shine & Rostom, 2021). There is a positive protein balance throughout life, although the protein turnover daily is more significant than nutrient intake, so amino acid recycling occurs (LaPelusa & Kaushik, 2023).

Dietary Intake of Proteins

The meals containing proteins should be high in quantity and quality because anabolic resistance leads to decreased muscle mass and strength when ageing or inactivity. This resistance can be negated by boosting the portion size of protein per meal (Phillips et al., 2020). Another parameter is nitrogen balance; nitrogen intake equals nitrogen output, which is neutral, and nitrogen indicates disease or growth in deficiency or excess (Gopalan & Kirk, 2022). Reduced muscle mass resulting from ageing, known as sarcopenia, can be prevented by consuming foods rich in protein, leucine, fruits and vegetables (Calvani et al., 2023). Protein timing is essential for recovery, with an evenly distributed 1.6 g/kg/day optimal for muscle protein synthesis (Joanisse et al., 2021).

Working Out and Protein

In summary, we can conclude that muscles do not completely recover from atrophy and do not return to work out habits during an injury without protein (Howard et al., 2020). Endurance athletes are recommended to consume 30 grams post-training for muscle recovery. Moreover, supplemental ribs enhance mitochondrial recuperation (Churchward-Venne et al., 2020). The nemesis evidence indicates that hydrolyzed polypeptides are better than integrative proteins (Morgan & Breen, 2021).

Obtaining Protein

Chronic diseases can be avoided by consuming legumes, soy, grains, nuts and seeds, all plant proteins (Garcia et al., 2022). On the other hand, vegetarians can have a deficit in bioavailability, which can be around 1.0g/kg (Zhong et al., 2012). Looking to the future, CP mushrooms, a new source of

protein, may be rich in amino acids and help enhance the economy and care of people while building muscle recovery. Legumes are wanted but lack access in developing areas (Ryckman et al., 2021).

Economic Factors in Protein Consumption

Protein supplements are widespread, probably because of social and economic factors. According to Coopoo et al. (2020) and Salman et al. (2022), it is not uncommon to see legumes being used as cheap alternatives. However, educating people about effective protein sources, especially in areas such as Pakistan, where they are short on food, can enable them to make wise food decisions.

Use of Protein Supplements

Almost half (43.8 – 50%) of the surveyed gym users reported receiving protein supplements, with males being predominant users due to muscle gain and recovery purposes (Ruano & Teixeira, 2020; Alhakhbany et al., 2022). These products, including protein powders and amino acids, represent a shift from focusing on a balanced diet to favouring achievable outcomes. Supplements can be beneficial to achieving fitness goals. However, there should be evidence of caution against overdependence since it undermines the merits of whole foods, indicating the need for professional help (Salman et al., 2022).

Protein and Fitness Goals

Protein intake combined with resistance training has been shown to improve muscle mass and strength significantly. Research indicates that consuming approximately 1.5 g of protein per kilogram of body weight daily leads to optimal results (Pasiakos et al., 2021). Diets higher in protein, specifically those where protein comprises 25–30% of total calorie intake, have also been linked to fat loss and improved body composition, mainly due to the thermogenic properties of protein (Apolinário et al., 2021). Among older adults, protein intake within the range of 1.2–1.59 g/kg/day can notably enhance physical health, while younger adults require higher amounts—at least 1.6 g/kg/day—for comparable benefits (Wolfe & Miller, 2020).

Social Network and Peer Influence

Protein supplement use is powerfully shaped by social influences and perceived benefits, with studies showing that 84% of gym enthusiasts rely on supplements (Smith et al., 2021). Male gym-goers show higher usage rates, reflecting societal norms associated with masculinity and strength. However, the reliance on unregulated information sources, such as peers and online platforms, raises concerns about the potential health risks of excessive or inappropriate supplement consumption (Phillips et al., 2020). Emphasizing the benefits of whole food-based diets and advocating for the regulated use of supplements are essential in promoting long-term, healthy fitness practices.

Methodology

This phenomenological study employed a descriptive research approach to explore physical activity practices related to protein intake among gym-goers and their health impacts (Smith et al., 2021). Participants aged 18–40, exercising 3–4 times weekly, were selected via purposeful sampling to provide detailed insights (Johnson & Miller, 2019). Recruitment used social networks, gym notice boards, and universities, following strategies proven effective in prior studies (Wolfe & Miller, 2020). Interviews were conducted with thirty participants from Karachi, Hyderabad, Sukkur, Lahore, Faisalabad, and Islamabad until data saturation was reached. A pilot study refined the guide to the interview to ensure it was concise and relevant.

Category	Subcategory	Number of Respondents
Total Respondents		30
Gender	Male	18
	Female	12
Residence District	Karachi	10
	Hyderabad	3
	Sukkur	2
	Lahore	5
	Faisalabad	3
	Islamabad	7
Age Bracket	18-25	10
	26-33	7
	34-40	13
Income Bracket (PKR)	80,000 - 100,000	10
	100,000 - 120,000	7
	120,000 - 140,000	5
	140,000+	8
Fitness Goals	Keep in Shape	17
	Build Muscle	13

Table 01: Respondent Profile

The respondent profile indicated a diverse sample of 30 participants, with more males (18) than females (12) and an age range from 18 to 40. Primarily from urban areas, particularly Karachi and Islamabad, most respondents aimed to build muscle (13) or maintain fitness (17), reflecting their varied fitness goals.

Braun and Clarke's (2006) Reflective Thematic Analysis were employed to identify and interpret patterns and themes in the qualitative data. Several themes, subthemes, and codes emerged from the interviews, as shown in Table 02.

Theme	Subtheme	Codes
Role of Protein and Nutrients in Fitness Outcomes	General Knowledge	Understanding protein's role, the Importance of a balanced diet, Awareness of macronutrients
	Protein and Muscle Maintenance Relationship	Protein aids muscle growth; protein improves recovery and muscle preservation through protein.
	Protein and Recovery Relationship	Faster recovery times, protein's role in reducing soreness, Nutritional strategies for recovery
Sources of Protein	Whole foods	Preference for whole foods, variety in protein sources, and focus on organic foods.
	Vegetarian Protein Sources	Use of legumes, Incorporation of plant-based proteins, Diversity in vegetarian options
	Economic Factors	Cost considerations in diet, Budgeting for protein intake, Seeking affordable protein sources
Use of Protein Supplements	Use of Supplements	Occasional supplement use, Preference for natural sources, and Supplement dependency concerns
	Barriers to Supplement Utilization	High costs of supplements, Limited access to quality supplements, Lack of knowledge on use
	Perceptions of Supplement Utilization	Scepticism about effectiveness, preference for whole foods over supplements, Mixed views on necessity
	Marketing and Social Media Influence	Impact of influencer marketing, Awareness of advertising strategies, Trust in social media recommendations
Protein and Fitness Goals	Muscle Gain and Maintenance	Focus on strength training, Tracking protein intake for muscle gain, and the importance of consistency.
	Fat Loss and Weight Management	Role of protein in weight loss, Strategies for fat reduction, awareness of calorie balance
	General Health and Fitness	Overall health benefits of protein, Integration of protein in daily meals, Long-term health strategies
Social Media and Peer Influence	Influence of Fitness Communities	Sharing experiences among peers, Collaborative learning in groups, Group motivation
	Influence of Social Media Influencers	Following fitness trends, engaging with online fitness communities, and influencing success stories.
	Influence of Advertising and Marketing Campaigns	Reactions to fitness ads, Perceptions shaped by marketing, awareness of advertising tactics
	Influence from Trainers	Trust in trainers' advice, Seeking personalized nutrition guidance, role of trainers in goal setting

Table 02: Themes and Sub-Themes Identified

Furthermore, informed consent was acquired from all participants, ensuring they understood the purpose of the research, the voluntary nature of participation, and their rights regarding confidentiality and data protection. Participants were assured that their anonymity would be maintained throughout the study, and they could withdraw at any stage without any consequences.

Data Analysis

The data analysis section explores how economic factors, social media influence, and individual knowledge shape gym-goers' protein consumption habits, focusing on affordability, whole foods, and perceptions of supplements.

Role of Protein and Other Nutrients in Fitness Outcomes

General Knowledge

A majority of the interviewees (65%) expressed a favorable understanding of protein's role in fitness, demonstrating adequate and relevant knowledge. For instance, Participant 3 remarked, "Protein is the building block of muscle, and I make sure I include it in every meal." Despite the strong focus on protein, a smaller subset of participants stressed the importance of a well-rounded diet, noting that other macronutrients also contribute to fitness. As Participant 7 pointed out, "Protein is vital, but I also ensure my diet includes enough fats and carbs," which aligns with the findings of Cruz-Jentoft et al. (2020).

Protein and Muscle Maintenance

The relationship between protein intake and muscle preservation was one of the key themes that cut across the interviews. Most of the respondents pointed out that increasing their protein intake directly impacted muscle growth and preservation. Participant 1 shared, "I noticed a big difference in muscle size when I increased my protein intake," while Participant 13 added, "Protein is what keeps my muscle mass steady, especially when I am trying to cut fat." These perspectives closely align with the conclusions of Mazzilli et al. (2021).

Protein and Recovery Connection

Participants showed a very good awareness of the role that protein plays in helping to recover muscles after working out. Participant 21 said, "After a heavy session, I always make sure to get in some protein; it helps speed up my recovery." However, some participants had a more extensive understanding of nutrition. For instance, Participant 17 noted, "Protein alone is not enough; other nutrients are important too." This view aligns with the findings of Aly et al. (2023), which indicate that balanced macronutrient intake is necessary for recovery.

Sources of Protein

Whole Foods

The interviews were revealed to favor whole foods for the source of protein, which would be in 53% preference for choices like fish, nuts, vegetables, chicken, and lean meats. Participant 3 said, "I focus on whole foods because I believe they provide the best nutrients for muscle growth." This preference aligns with Mariotti and Gardner's (2023) research that supports the adequacy of protein and amino acid intake in vegetarian diets when planned thoughtfully. Furthermore, Participant 2 identified the importance of dietary variety as shown in the quotation below: "I try to include different sources like eggs, legumes, and dairy to keep my diet balanced."

Vegetarian Protein Sources

Although whole foods remained the most commonly consumed option, 23% of respondents relied on vegetarian protein sources. Many found it cost-effective and sustainable, hence their preference for plant-based sources such as legumes, tofu, and non-GMO pea protein. As explained by participant 8, "I choose plant-based proteins because they are cost-effective and good for the environment." This view corresponds with Dolganyuk et al. (2024).

Economic Factors

Economic factors played a huge role in the selection of proteins by participants. Many claimed that they needed to budget their protein intake. Participant 8 stated, "I always look for affordable protein sources because it helps me manage my expenses while staying healthy." This was especially true for

those who considered whole foods as their first choice, looking to maintain a balanced diet without overspending. Ryckman et al. (2024) also mention the affordability of healthy foods. People with a goal to achieve muscle gain intake more amount of protein which usually is about 120-130 grams in a day supplemented with protein shakes in some instances. Participant 12 said, "I do need protein shakes after workouts for muscle building."

Use of Protein Supplements

Among the study participants, 35% use protein supplements periodically, with an overwhelming number consisting of males. This population consisted mainly of men who consumed substances such as omega-3, protein powders made from whey protein isolate among others, based on previous reviews (Dolganyuk et al., 2024). Participant 27 noted that, "I take omega-3 because it helps my joint health." Despite this, others were less affirmative about supplement supplements. Participant 22 expressed, "I don't believe that supplements are as good as everyone makes them out to be; I would rather get my nutrients from the whole food itself."

Barriers to Supplement Utilization

Of the respondents, 35% claimed they used supplements on occasion. Males made up the largest population of those that reported use of supplements, although the primary items were products like omega-3 supplements and protein powders like whey protein isolate, indicating a pattern observed in other research studies (Dolganyuk et al., 2024). Participant 27 said, "I take omega-3 because it helps my joint health." Some of the participants remained cynical about supplement efficacy. Participant 22 said, "I am not sure that supplements are as good as people say they are; I get my nutrients from whole foods."

Perceptions of Supplement Utilization

A majority of non-users believed supplements were not essential. Participant 2 said, "I believe that a healthy diet will provide me with all I need; supplements are not needed." In contrast, supplement users frequently relied on recommendations from social media. Participant 9 noted, "I see influencers who talk about specific brands that they claim to be effective and use those products." It reflects the heavy influence of marketing campaigns, according to Nagar (2024).

Marketing and Social Media Influence

The participants found that social media was the most crucial factor in supplement consumers. Participant 9 stated, "I always see ads on Instagram about new protein powders, and it makes me curious to try them." Most participants believed that the influence of social media, especially through endorsements, guided them toward purchasing supplements. This finding is in line with Coopoo et al.'s (2024), which reported that there is a significant relationship between social media usage and the consumption of supplements.

Protein and Fitness Goals

Muscle Gain and Maintenance

Among the participants, 43% were focused on muscle gain, with a dominant view that protein intake was key to achieving this goal. Strength training and tracking protein consumption were frequently mentioned strategies. Participant 19 stated, "I have been lifting weights for over a year now, and I make sure to get at least 1 gram of protein per kilo of body weight." Many participants also emphasized the importance of consistency in their diets. These views align with Morgan and Breen (2022), who highlight

the critical role of protein, particularly protein hydrolysates, in muscle recovery and growth following exercise.

Fat Loss and Weight Management

A majority (56%) of participants focused on fat reduction, with the role of protein in weight loss being a dominant view. However, 13% of this group lacked awareness about calorie balance. Participant 6 shared, "I know maintaining diet is important for fat loss, but I am not always sure how to balance calories". In contrast, participant 4 remarked, "I try to keep my calories in check, but it is difficult to track everything all the time." This aligns with the findings of Gwin et al. (2023).

General Health and Fitness

Protein was recognized for its health benefits, especially for long-term fitness. Participant 5 commented, "I make sure to include protein in every meal, whether it is eggs for breakfast or chicken for dinner; it is just part of my routine now," which corresponds with Cruz-Jentoft et al. (2019). Those seeking muscle gain took 1–1.3g/kg/day, often complemented with protein powders. General fitness enthusiasts consumed 0.7–1g/kg/day, which agrees with Dolganyuk et al. (2022).

Social Media and Peer Influence

The study pointed out the significant influence of this generation of social media and peer groups since 67% relied on online sources more than traditional trainers. Participant 6 said, "I am part of a few fitness communities on Instagram where we share our experiences, which helps keep me motivated." Social media influencers also influenced dietary trends, as Participant 2 commented, "I follow several fitness vloggers... most of them are quite expensive." Marketing campaigns also influenced perceptions, as ads increased interest in protein supplements. Contrastingly, Participant 12 said, "My coach stressed the protein issue," highlighting dependency on individualistic training, similar to Almousa et al. (2020).

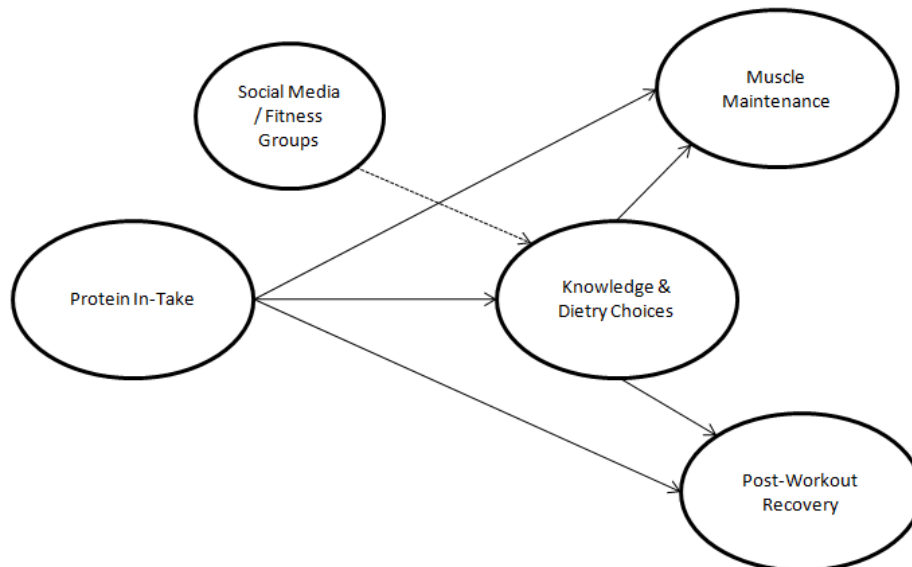


Figure 01: Thematic Mapping

The results also present differences in how much knowledge they have about diet balance among participants. A percentage of the participants appreciated that although protein is present, carbohydrates and fats should as well be provided, while fewer had a problem with the issue of calorie balancing and

moderation. In addition, social media influencers greatly contributed to perceptions about diet balance by negating or affirming what the participants believed initially.

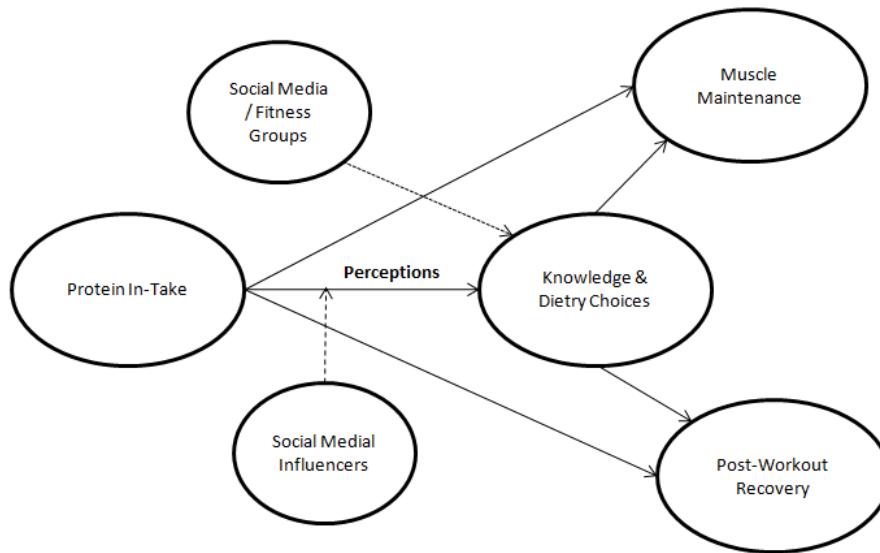


Figure 02: Thematic Mapping

Economic factors are a significant determinant of dietary choices, with most respondents preferring whole food sources because they are cheaper. The emerging trends at this stage highlight the importance of financial constraints in determining dietary preferences, especially the preference for whole-food protein sources over supplements. For gym-goers, budget constraints often result in a preference for cheap, plant-based protein sources, and there is a clear causal relationship between financial considerations and protein consumption habits.

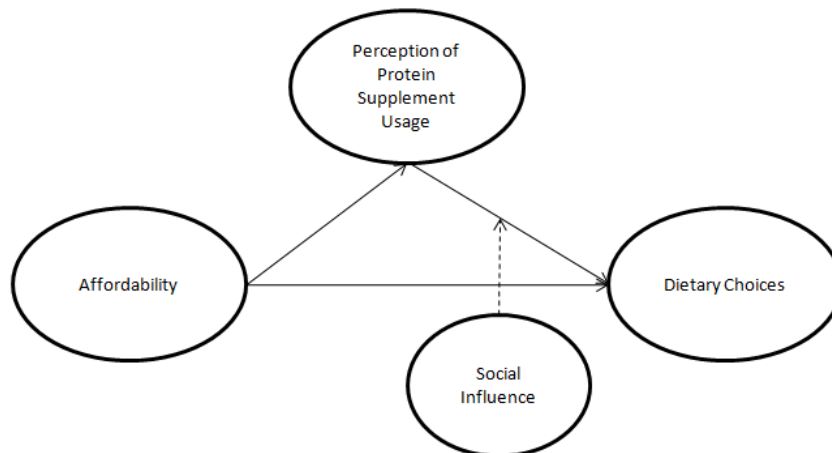


Figure 03: Thematic Mapping

Social Influences on Protein Consumption

Social factors also contribute, as discussions among peers and endorsements in the fitness community create a certain impression of protein intake. More active individuals on social media will hear of stories of people who have succeeded because of supplements. But economic conditions decide if it is feasible or not. Economic, social, and individual knowledge are factors that intersect in decision-making related to protein consumption.

Conclusion and Future Directions

This study considered the factors that influence protein intake among Pakistani gym-goers, considering economic, cultural, and awareness-related barriers. In spite of the fact that participants could show their understanding about the necessity of protein for muscle growth and repair, financial constraints and distrust of supplements led them to rely more on natural sources of protein, such as lentils, eggs, and chicken. Social media and fitness communities highly influence dietary choices, as the influencers and trainers usually direct one to the more affordable and culturally relevant diets.

This research develops consumer behavior theory by considering the interaction of economic and social determinants of diet in the context of fitness. It underlines how fitness enthusiasts modify their feeding behaviors to accommodate proteins within their budgetary constraints. For fitness practitioners and coaches, the study recommends that the inclusion of cheap, nutrient-rich diets be encouraged and the financial constraint overcome. To better fitness results, authorities and health care should enhance awareness, purchasing power, and education on balanced diets and proper supplementation.

Despite the valuable insights, the study has limitations. Though geographically diverse, the sample size was restricted to 30 participants, which may limit generalizability. Increasing the sample size and including rural or socio-economically diverse participants could strengthen future findings. Moreover, reliance on self-reported data through interviews may introduce biases; future studies could use objective measures like dietary logs or biomarker analysis for validation.

Further research might be done on the influence of social and cultural norms on dietary decisions across different demographics, including gender, age, and socio-economic status. An investigation into how fitness trainers and influencers impact long-term dietary behaviour would offer methods for improving the adoption of healthy habits. A study of alternative protein sources, including plant-based ones, would allow for addressing economic constraints and cultural preferences while ensuring sustainable dietary practices. This study highlights the importance of culturally and economically appropriate strategies to support fitness goals in Pakistan. It offers theoretical insights, practical recommendations, and a foundation for advancing dietary practices and fitness outcomes in emerging markets.

Author's Contribution

Conception or Design: Syed Fauzan Ali, Areeba Khan

Data Collection and processing, Analysis or Interpretation of Data: Areeba Khan, Syed Fauzan Ali, Areeba Khan, Nisar Ahmed, Imran Khan, Syed Fauzan Ali, Areeba Khan

Manuscript Writing & Approval: Syed Fauzan Ali, Areeba Khan

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