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Research Paper

An electronic survey on general awareness of consumption of protein powders amongst the youth in India

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Abstract: *Sports nutrition products are developed and targeted mainly for athletes to improve their nutrient intake, performance, and muscle growth. Although athletes may have elevated physiological protein requirements and they may benefit from dietary supplements, the evidence regarding the role of dietary protein and supplements in the nutrition of recreational sportspeople and sedentary populations is somewhat complex and contradictory. The fastest growing consumer groups for these products are recreational sportspeople and lifestyle users. In high-protein diets, more undigested protein-derived constituents end up in the large intestine compared to moderate or low-protein diets, and hence, more bacterial amino acid metabolism takes place in the colon, having both positive and negative systemic and metabolic effects on the host.*

Keywords: *dietary supplements market, sports nutrition, high-protein diets*

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I. INTRODUCTION:

The fundamental challenge in any discussion about the regulation of dietary supplements is that there is no global consensus on how the category of products known variously as dietary supplements, natural health products (NHPs), complementary medicines or food supplements in different countries is defined. For example, a product considered to be a dietary supplement and regulated as a food in many countries or in another jurisdiction may be considered a food supplement or a therapeutic good (complementary medicine) or a therapeutic good (prescription medicine) or potentially even a controlled substance. The law defines dietary supplements in part as products taken by mouth that contain a "dietary ingredient." Dietary ingredients include vitamins, minerals, amino acids, and herbs or botanicals, as well as other substances that can be used to supplement the diet. Dietary supplements come in many forms, including tablets, capsules, powders, energy bars, and liquids. [1]

As such, there are a number of types of supplements, such as those that compensate for inadequate daily dietary intake; those that help with accelerated weight loss, and those that improve the ability to gain weight and muscle. Dietary supplements not only used to improve problems related to weights and muscles but also used to improve health products. A potential problem related with the use of dietary supplements that people don't consume it with other foods like vegetables and other natural products.[2]

NUTRITIONAL SUPPLEMENTS

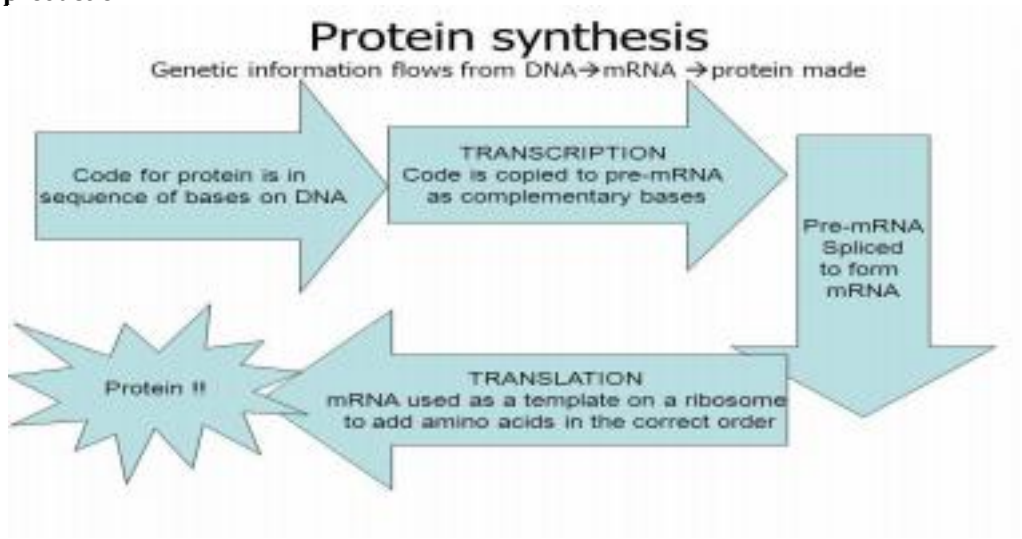
Diet and physical activity are well recognized to play an important role in maintaining health and disease prevention. Dietary supplements (DS) are also commonly believed to be health promoting activity and fitness promoting activity. However, DS lacks a single uniform definition within the scope of legal or nutritional sciences. Food supplements as concentrated sources of nutrients or other substances with a nutritional or physiological effect intended to supplement a normal diet. These products may contain vitamins, minerals, herbs, amino acids and other substances like peptides and muscle gaining ingredients, or their constituents. DS are usually offered in tablets, capsules, powders, or pills. DS intake intends to prevent disease, upgrade mental and general health, enhance sport performance, and compensate for dietary deficiencies. The important fact is that a considerable number of people consuming DS do not seek any medical advice before taking it. DS are considered dietary products and therefore they are available not only in pharmacies, but also in other places, such as groceries or online stores. Vast numbers of people do not tell the difference between medication and DS frequently administering different groups of preparations at the same time neglecting possible interactions between the substances contained in them. The most commonly used DS include vitamins, minerals, and plant products, while in the EU countries, products containing vitamins and minerals account for 50% of total sales, DS containing other substances have 43% market share, and energy drinks are least popular at about 70%. Nutritional supplements are widely used among patients with cancer who perceive them to be anticancer and antitoxic agents.[3]

Nutritional supplement products

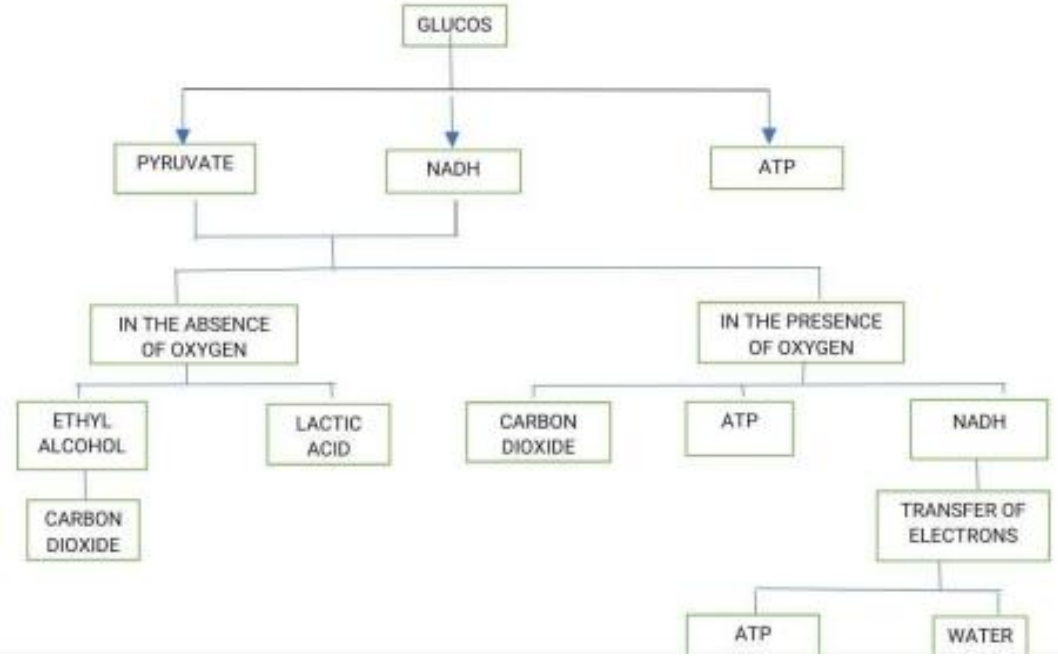
Nutritional supplements are substances you might use to add nutrients to your diet or to lower your risk of health problems, like osteoporosis or arthritis. Dietary supplements also come in the form of tablets(gels), extracts, or liquids. They might contain vitamins, minerals, fibres, amino acids, herbs or other plants, or enzymes. Sometimes, the ingredients in dietary supplements are added to foods, including drinks. A doctor's prescription is not needed to buy dietary supplements because DS doesn't have serious side effects like death. Calcium works with vitamin D to keep bones strong at all ages. Bone loss can lead to fractures in both older women and men. Calcium is found in milk and milk products (fat free or low-fat is best), canned fish with soft bones, dark-green leafy veggies like kale, and foods with calcium added, like breakfast cereals. Most people's bodies make enough vitamin D if they are in the sun for 15 to 30 minutes at least twice a week. But, if you are older, you may not be able to get enough vitamin D that way. Try adding vitamin D-fortified milk and milk products, vitamin D-fortified cereals, and fatty fish to your diet, and/or use a vitamin D supplement. Vitamin B6 is needed to form red blood cells. It is found in potatoes, bananas, chicken breasts, and fortified cereals. Vitamin B12 helps keep your red blood cells and nerves healthy. While older adults need just as much vitamin B12 as other adults, some have trouble absorbing the vitamin naturally found in food. If you have this problem, you should eat foods like fortified cereals that have this vitamin added, or use a B12 supplement.[4]

Use of nutritional supplements is widespread in the general population in those who participate in sports and in military populations. Reported reasons for nutritional supplements use in a survey of active-service personnel were to improve health (64%), provide more energy (31%), increase muscle strength (25%), and enhance performance (17%). The use of performance-enhancing nutritional supplements seems to be endemic in the athletic population, and the use of these supplements seems to begin at a young age. A recent large-scale survey of U.S. youth suggested that the use of all performance-enhancing nutritional supplements ranged from 5 to 17% at different locations across the United States. In all surveys of nutritional supplement use in the active or athletic population, nutritional supplements are consistently among the most popular, especially among those performing resistance training and body weight training or powerlifting. Nutritional supplements also used to gain body weight for those whose body weight is very less and those whose body type is ectomorphs, so these type of people uses nutritional supplements and can Gain body weight and can be strong and improve health.[5]

Protein production



Whey protein is a mixture of proteins isolated from whey the liquid material created as a by-product of cheese production. The proteins consist of alpha globulin, beta lactoglobulin, Serum albumin and immunoglobulins. Whey protein is commonly marketed as a dietary supplement, and various health claims have been attributed to it.Whey is left over when milk is coagulated during the process of cheese production, and contains everything that is soluble from milk after the PH is dropped to 4.6 during the coagulation process. It is a 5% solution of lactose in water with lactalbumin and some lipid content. Processing can be done by simple drying, or the relative protein content can be increased by removing the lactose, lipids and other non-protein materials. For example, spray drying after membrane filtration separates the proteins from whey. They can be denatured by heat. High heat (such as the sustained high temperatures above 72 °C associated with the pasteurization process denatured whey proteins. While native whey protein does not aggregate upon renneting or acidification of milk, denaturing the whey protein triggers hydrophobic interactions with other proteins, and the formation of a protein gel. Whey protein is now also quite commonly used as a thickener to improve the texture and decrease syneresis in many types of yogurts. Yogurt with high amounts of protein have been more commonly found on shelves due to the recently increasing popularity of Greek yogurt.[6]



Protein powders

Protein powders are powdered forms of protein that come from plants (soybeans, peas, rice, potatoes, or hemp), eggs, or milk (casein or whey protein). The powders may include other ingredients such as added sugars, artificial flavouring, thickeners, vitamins, and minerals. The amount of protein per scoop can vary from 10 to 30 grams. Supplements used for building muscle contain relatively more protein, and supplements used for weight loss contain relatively less. [6]

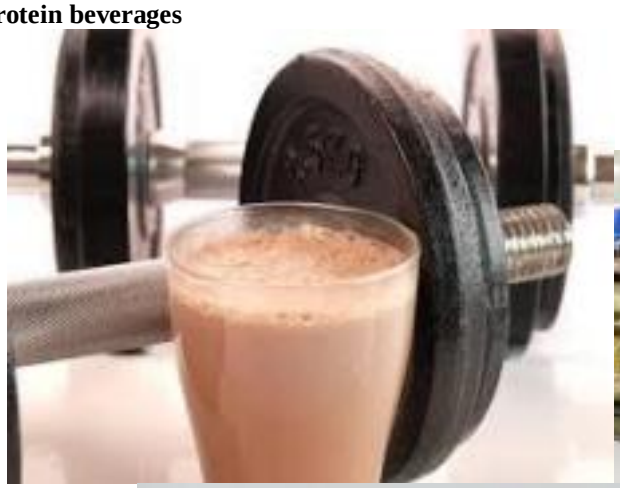
Daily protein goals

Aim for the Recommended Dietary Allowance for protein intake: 46 grams per day for women and 56 grams for men. For example:

· an egg for breakfast (6 grams) or oats (6 grams)
· 6 ounces of plain Greek yogurt at lunch (18 grams)
· a handful of nuts for a snack (4–7 grams)
· a cup of milk (8 grams) and 2 ounces of cooked chicken for dinner (14 grams).

There are numerous risks to consider when using a protein powder. A protein powder is a dietary supplement. The FDA leaves it up to manufacturers to evaluate the safety and labelling of products. So, there's no way to know if a protein powder contains what manufacturers claim. We Cannot predict the long-term effects. There is limited data on the possible side effects of high protein intake from supplements. It may cause digestive distress. People with dairy allergies or trouble digesting lactose [milk sugar] can experience gastrointestinal discomfort if they use a milk-based protein powder. [6]

Protein beverages



A protein shake is a dietary supplement. Typically, it consists of protein powder mixed with water, milk, or a milk substitute. Depending on the manufacturer, the beverage may contain other ingredients such as flavourings, vitamins and branched chain amino acids. Proteins shakes or beverages are very useful for those who find difficulty in consuming solid tablets. Protein shakes can be an easy way to increase protein intake. This may be useful for people looking to put on muscle, lose weight, or promote injury recovery. The Food and Drug Administration (FDA) does not regulate dietary supplement a strictly trusted sources pharmaceutical. Therefore, it is the responsibility of the manufacturers to evaluate product safety and label them accordingly. Alternatively, they may receive certification from third party testing. This means it can be difficult to verify that the protein powder contains what the manufacturer's claim. A person with dairy allergies or lactose intolerance may experience digestive issues if they use a milk-based protein powder. Fortunately, there are vegan and lactose-free alternatives for people who cannot have or do not want dairy or lactose. Protein beverages are a very useful and important thing to drink protein powders because most of the bodybuilders who compete at international level for bodybuilding competition consume the protein in the form of beverages. Gym trainer suggest to consume protein powder in the form of liquid for better digestion.[7]

The recent trend of youth

Young athletes need slightly more protein than their peers who aren't athletes. Protein needs are based on age, sex, body weight and stage of development, with teens needing between 10 to 30% of their daily calories from protein. Although an individual's exact needs will vary, the Recommended Dietary Allowance (RDA) provides a good reference for how much of a certain nutrient a healthy individual needs in a day. The RDA for protein is 46 grams for teenage girls and 52 grams for teenage boys per day. Work Builds Muscle Although eating protein doesn't build muscle on its own, the presence of protein in an athlete's eating pattern is important. Believe it or not, when you exercise, such as lifting weights or running, some of your muscle cells break down. Protein from food helps repair this damage from exercising and builds up more muscle, making them stronger. Youngsters are crazy for protein supplements and going to the gym. They go to the gym and consume protein supplements to look good and have a good impression among them and also consume it for remaining feet and muscular as to impress other people. Some youngsters also consume it for health benefits

and to maintain their proper shapes. Nowadays it has become fashionable for them to look good so they go for protein supplements. [8,9]

Possible harmful effects

Whey protein is likely safe for most children and adults when taken appropriately. High doses can cause some side effects such as increased bowel movements, nausea, thirst, bloating, cramps, reduced appetite, tiredness (fatigue), and headache. Upset Digestive System, Because Unhealthy Weight Gain, Can Lower Blood Pressure Too Much, Might Affect Kidneys, Can Disrupt Hormones. There are various side effects of protein supplements which are based on content as well as amount of ingredients. When we consume protein powder which has toxic ingredients it will lead to side effects. Amount of protein intake should be proper. If it is inappropriate it will lead to possible harmful effects. [10]

Malpractice by industry

The drop in the number of paid malpractices claims against health care workers hasn't been even across all states either. Some states (e.g., Texas) have seen a dramatic drop in both the number of paid medical malpractice claims and the total amount paid in medical malpractice. Other states (e.g., Louisiana) have seen very little change in either the number of paid claims or the amount paid. All of the graphs provide medical malpractice data for all health care professionals as well as for physicians (MDs and DOs) only. Claims against all health care professionals include claims against physicians, nurses, nurse practitioners, psychologists, social workers, councillors, optometrists, dentists, dental hygienists, pharmacists, pharmacy techs, podiatrists, physical and occupational therapists and speech therapists.[10]

Protein content

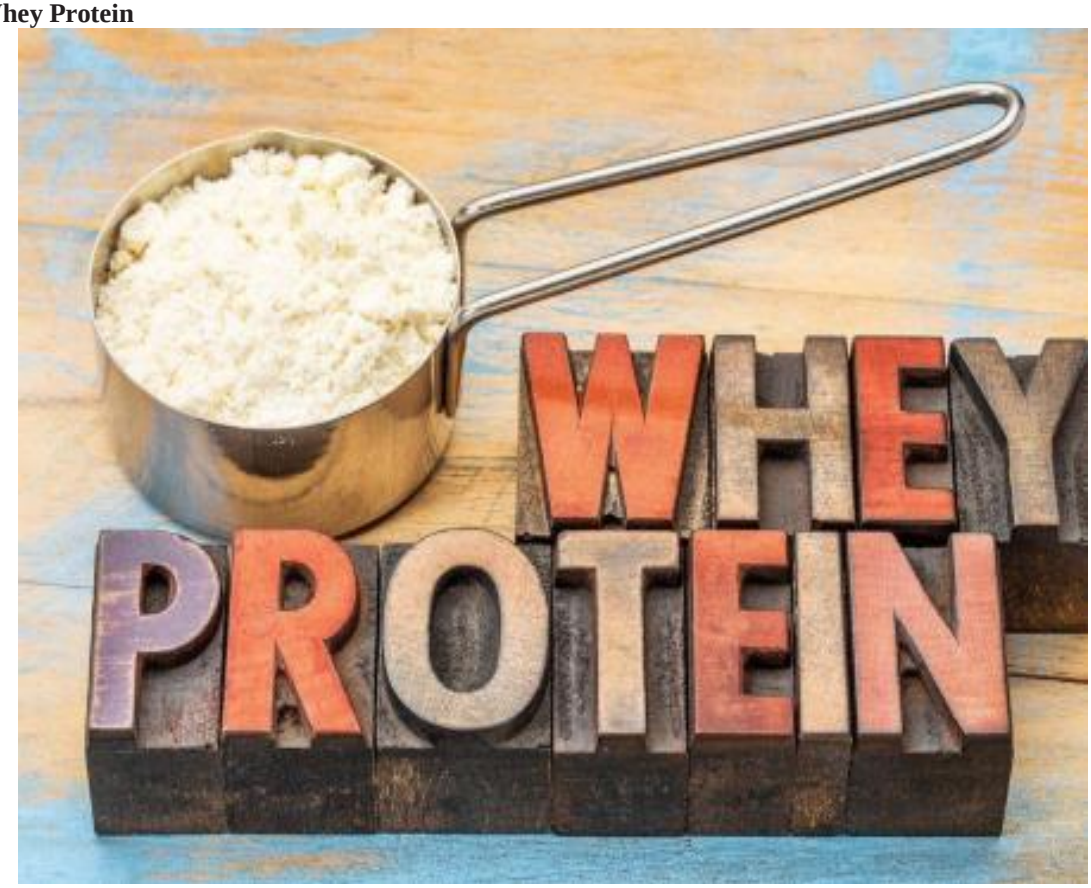
Proteins may be defined as compounds of high molar mass consisting largely or entirely of chains of amino acids. Their masses range from several thousand to several million Daltons (Da). In addition to carbon, hydrogen, and oxygen atoms, all proteins contain nitrogen and sulphur atoms, and many also contain phosphorus atoms and traces of other elements. Proteins serve a variety of roles in living organisms and are often classified by these biological roles. Muscle tissue is largely protein, as are skin and hair. Proteins are present in the blood, in the brain, and even in tooth enamel. Each type of cell in our bodies makes its own specialized proteins, as well as proteins common to all or most cells. We begin our study of proteins by looking at the properties and reactions of amino acids, which is followed by a discussion of how amino acids link covalently to form peptides and proteins. We end the chapter with a discussion of enzymes—the proteins that act as catalysts in the body. The main composition of protein are amino acids, peptides, enzymes, fat, carbohydrates and minerals.[11]

TYPES OF PROTEIN POWDER

Protein powders are very popular among health-conscious people. There are numerous types of protein powder made from a wide variety of sources. As there are so many options, it can be difficult to determine which will provide optimal results.[12]

Here are 7 of the best types of protein powder. We include products we think are useful for our readers. If you buy through links on, we may earn a small commission.

1. Whey Protein



Whey protein comes from milk. It is the liquid that separates from the curds during the cheese making process. It's high in protein but also harbours lactose, a milk sugar that many people have difficulty digesting. While whey protein concentrate retains some lactose, the isolate version contains very little because most of this milk sugar is lost during processing. Whey digests quickly and is rich in branched-chain amino acids (BCAAs). Leucine, one of these BCAAs, plays a major role in promoting muscle growth and recovery after resistance and endurance exercise. When amino acids are digested and absorbed into your bloodstream, they become available for muscle protein synthesis (MPS), or the creation of new muscle.

SUMMARY Whey protein is quickly digested, providing a rapid rise in amino acids that may help increase muscle mass and strength. It may also reduce appetite and promote fat loss.[12]

2. Casein Protein

Like whey, casein is a protein found in milk. However, casein is digested and absorbed much more slowly.Casein forms a gel when it interacts with stomach acid, slowing down stomach emptying and delaying your bloodstream's absorption of amino acids. This results in a gradual, steadier exposure of your muscles to amino acids, reducing the rate of muscle protein breakdown. Research indicates that casein is more effective at increasing MPS and strength than soy and whey protein — but less than whey protein. However, one study in overweight men suggests that when calories are restricted, casein may have an edge over whey in improving body composition during resistance training.

SUMMARY Casein is a slow-digesting dairy protein that may reduce muscle protein breakdown and promote muscle mass growth and fat loss during calorie restriction.[12]

3. Egg Protein

Eggs are an excellent source of high-quality protein. Of all whole foods, eggs have the highest protein digestibility-corrected amino acid score (PDCAAS). This score is a measure of a protein's quality and digestibility. Eggs are also one of the best foods for decreasing appetite and helping you stay full for longer.

However, egg protein powders are typically made from egg whites rather than whole eggs. Although the protein quality remains excellent, you may experience less fullness because the high-fat yolks have been removed. Like all animal products, eggs are a complete protein source. That means they provide all nine essential amino acids that your body can't make itself. What's more, egg protein is second only to whey as the highest source of leucine, the BCAA that plays the largest role in muscle health. In another, female athletes taking egg-white protein experienced similar gains in lean mass and muscle strength as those supplementing with carbs. Egg-white protein could be a good choice for people with dairy allergies who prefer a supplement based on animal protein.

SUMMARY Egg-white protein is high in quality and easily digested — though it may not keep you feeling as full as other protein powders.[12]

4. Pea Protein

Pea protein powder is especially popular among vegetarians, vegans and people with allergies or sensitivities to dairy or eggs. It's made from the yellow split pea, a high fibre legume that boasts all but one of the essential amino acids. Pea protein is also particularly rich in BCAAs. A rat study noted that pea protein is absorbed slower than whey protein but faster than casein. Its ability to trigger the release of several fullness hormones may be comparable to that of dairy protein. In a 12-week study in 161 men doing resistance training, those who took 1.8 ounces (50 grams) of pea protein daily experienced similar increases in muscle thickness as those who consumed the same amount of whey protein daily. In addition, a study revealed that humans and rats with high blood pressure experienced a decrease in these elevated levels when they took pea protein supplements. Though pea protein powder shows promise, more high-quality research is needed to confirm these results.

SUMMARY While studies are limited, pea protein may promote fullness and increase muscle growth as effectively as animal-based proteins.[12]

5. Hemp Protein

Hemp protein powder is another plant-based supplement that is gaining popularity. Although hemp is related to marijuana, it only contains trace amounts of the psychoactive component THC. Hemp is rich in beneficial omega-3 fatty acids and several essential amino acids. However, it is not considered a complete protein because it has very low levels of the amino acid lysine and leucine. While very little research exists on hemp protein, it appears to be a well-digested plant protein source

SUMMARY Hemp protein is high in omega-3s and seems to be easily digested. However, it is low in the essential amino acid lysine and leucine.[12]

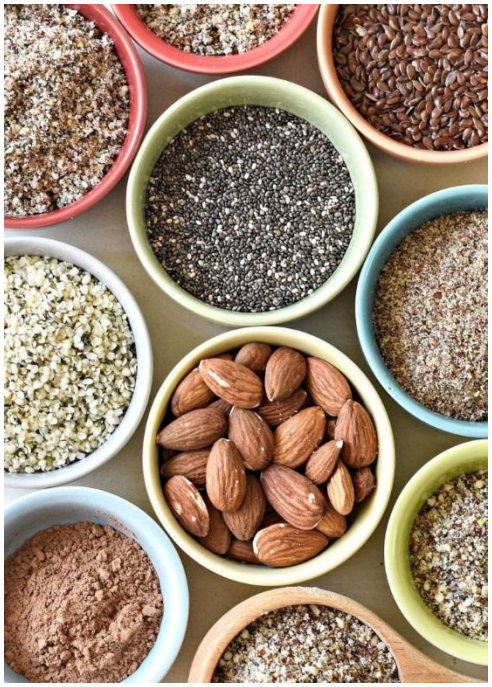
6. Brown Rice Protein

Protein powders made from lysine protein have been around for some time, but they are generally considered inferior to whey protein for building muscle. Although rice protein contains all of the essential amino acids, it is too low in lysine to be a complete protein. There isn't a lot of research on rice protein powder, but

one study compared the effects of rice and whey powders on fit, young men. The eight-week study demonstrated that taking 1.7 ounces (48 grams) of rice or whey protein daily resulted in similar changes in body composition, muscle strength and recovery. However, more research on brown rice protein is needed.

SUMMARY Early research on brown rice protein powder suggests it may have beneficial effects on body composition. However, it is low in the essential amino acid lysine.[12]

7. Mixed Plant Proteins



Some protein powders contain a blend of plant sources to provide your body with all the essential amino acids. Two or more of the following proteins are usually combined:

- Brown rice
- Pea
- Hemp
- Alfalfa
- Chia seeds
- Flax seeds
- Artichoke
- Quinoa

Due in part to their high fibre content, plant proteins tend to digest slower than animal proteins. Although this may not pose a problem for many people, it can limit the amino acids your body can use immediately after exercise. One small study provided resistance-trained young men with 2.1 ounces (60 grams) of whey protein, a pea-rice protein blend or a pea-rice blend with supplemental enzymes to accelerate digestion.[12]

Protein bars

Protein bars, which contain some form of milk-derived or plant-based protein like whey, hemp, pea or rice protein. Protein bars are usually lower in carbs than energy bars, lower in vitamins and dietary minerals than meal replacement bars, and significantly higher in protein than either.

A typical energy bar weighs between 45 and 80 g and is likely to supply about 200– 300 calories (840–1,300 kJ), 3–9 g of fat, 7–15 g of protein, and 20–40 g of carbohydrates. In order to provide energy quickly, most carbohydrates are various types of sugars like fructose, glucose, maltodextrin and others in various ratios, combined with complex carbohydrate sources like oats and barley. Proteins come mostly in the form of fast digesting whey protein. Energy bars generally don't contain sugar, alcohol since these bars, due to the type of carbohydrate content; don't require low calorie sweeteners to improve their taste. Fats in energy bars are kept to minimum and their main sources are often cocoa butter and dark chocolate. Energy bars are used as energy source during athletic events like marathon, triathlon and other events and outdoor activities, where energy expenditure is high, for longer period of time.[13]

II. METHODOLOGY

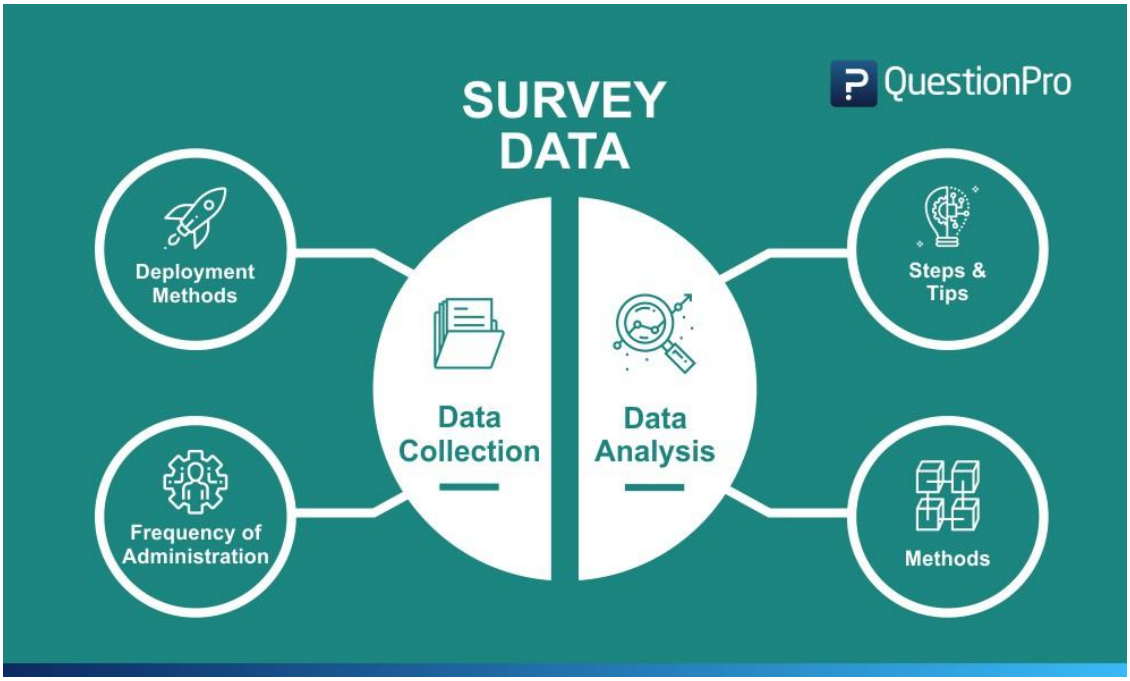
This was a descriptive, cross-sectional study. Cross-sectional surveys are an observational research method that analyses data of variables collected at one given point of time across a sample population or a pre-defined subset. The survey data from this method helps the researcher understand what the respondent is feeling at a certain point in time. It helps measure opinions in a particular situation. Online surveys are the most cost-effective and can reach the maximum number of people in comparison to the other mediums. The performance of these surveys is much more widespread than the other data collection methods. In situations where there is more than one question to be asked to the target sample, certain researchers prefer conducting online surveys over the traditional face-to face or telephone surveys.

Data Entry and Data Management

The data was gathered by using Google forms and Data was processed using Microsoft Excel, Microsoft word. The collected data is about proper use of protein supplements among the youths. Data will be entered manually and will be revised twice to check for any typing errors or missing responses.

Data Collection & Data Analysis

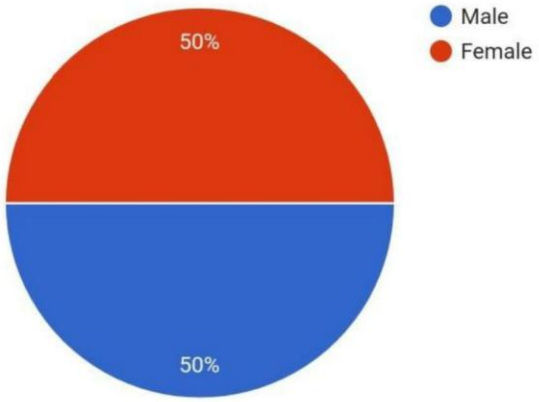
Survey data is defined as the resultant data that is collected from a sample of respondents that took a survey. This data is comprehensive information gathered from a target audience about a specific topic to conduct research. There are many methods used for survey data collection and statistical analysis.



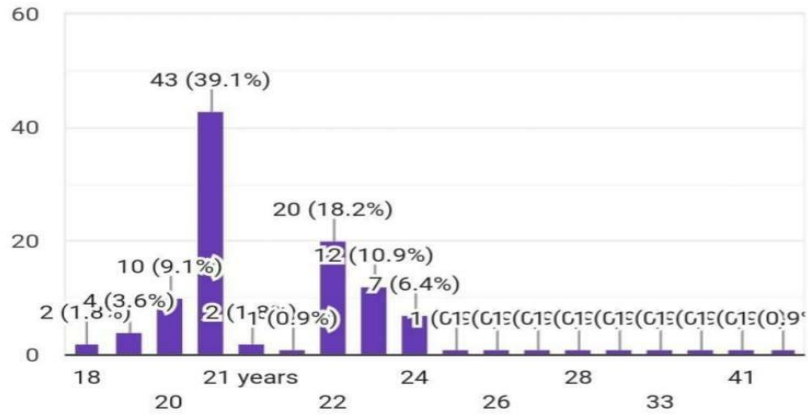
Prior to collecting any data, a pilot study was conducted with 212 students who gave their approval to verify and validate the questionnaire. Specifically, tests of honesty and consistency were conducted to verify the validity and stability of the questionnaire. Protein supplement consumption, frequency of use and association with other dietary supplements has been investigated. Subsequently frequency distribution has been used for demographic assessment. Data Collection Data will be collected with the use of a questionnaire with closed ended questions. These surveys are going to be distributed to the youth and several gym goers attending the gyms. Data will include the results of weight and height measurements in addition to the proportions resulting from our study design regarding the knowledge and intake of protein supplements. Data will be described, organized and summarized using tables and graphs. Permission to conduct the study was obtained from Oriental college of pharmacy, Sanpada. The survey consisted of 28 questions, divided into two main parts. The first part collected demographic and personal information on the study participants: age, sex, and the type of supplements they may or may not take. The second part obtained information regarding the usage, consumption, exercise, importance, source of information and safety of protein supplements. This study was approved by the oriental college of pharmacy Sanpada. All participants were between the age group of (18 to 50 years). The survey was conducted and distributed with students' informed consent. The consent procedure involved informing students of the objective of the study and their rights to confidentiality and to accept or refuse participation of their own volition. A total of 212 responses were obtained, some of which were excluded because they provided incomplete questionnaires. Thus, the data of 201 participants were analysed. Survey was sent at the beginning of March 2021 and data collection continued throughout the month of March2021 academic year. An electronic questionnaire was designed for this study. It contained questions based on protein supplements and anthropometric data (height (cm), weight (kg). Nutritional awareness of protein supplements, their usefulness, and safety, knowledge and consumption of recommended daily servings of fruits and vegetables based, and patterns of consumption of protein supplements (reasons for taking supplements, where they purchase supplements, who prescribes the supplements, number of supplements actually taken, frequency of taking supplements, and the continuity of taking supplements). All results have been summarized in tables and graphs. The objective of the study was to explore the composition of protein supplements available in the Sports Supplement stores. The composition of these products was studied in terms of protein content, source and cost. All (three) protein supplement stores in the city of Mumbai were identified. All protein supplements from the websites of these stores were listed. Further, the detailed composition of these products was accessed from official websites of the respective brands. Products that did not provide Nutrition Facts Panel were excluded from the study.

III. SURVEY DATA AND ANALYSIS

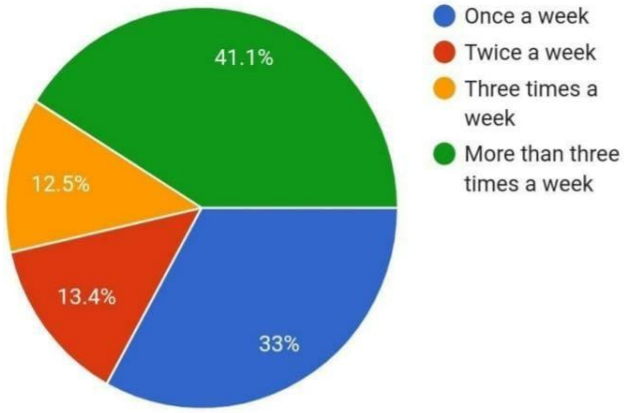
The survey was done on 212 people across the city of Mumbai. In the following survey we figured out that out of these 212 candidates who gave the online survey 50% of them were male and 50% of them were female.



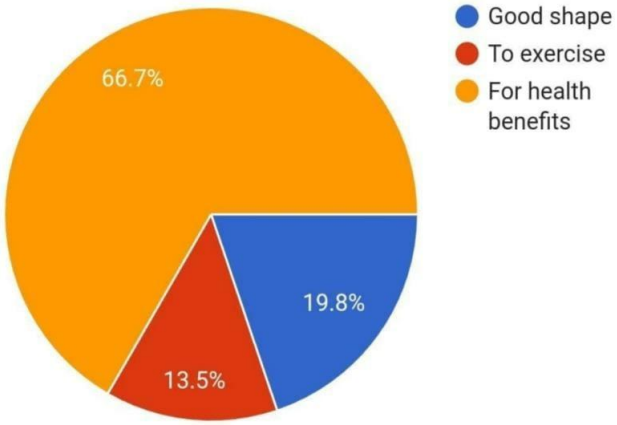
The survey was done across age groups from 18-50 years. In which most of the candidates who attempted the online survey were between the ages of 18-24 years.



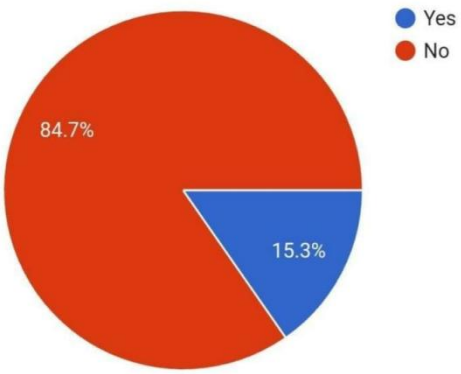
When asked to the 212 candidates about how much and how many times they workout in a week the major population of the survey answered they work out more than 3 times a week.



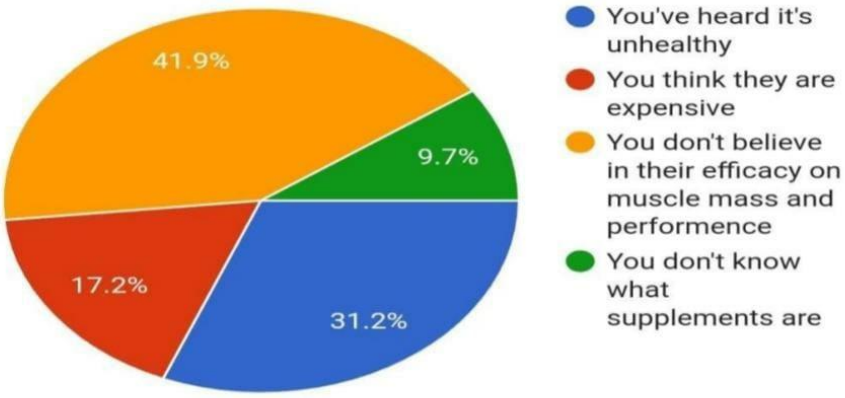
Many of the candidates when asked why they started going to guy or why did they started to workout majority of them (66.7%) answered that they attend gym because of its health benefits.



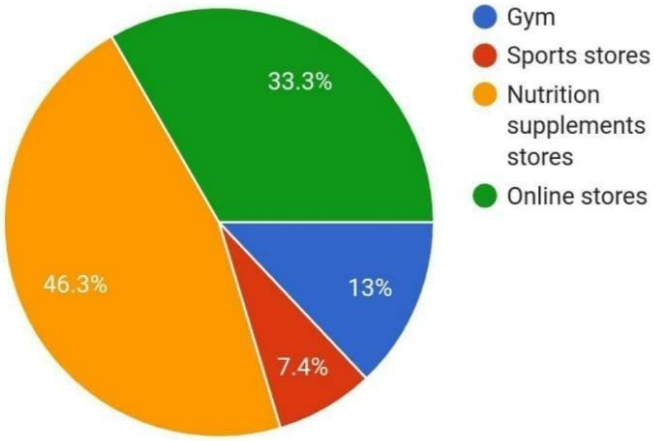
According to the survey (84.7%) of the people don't consume any additional protein supplements in order to increase mass or gain muscle. While 15.3% of the candidates do take extra protein supplements in order to increase muscle mass.



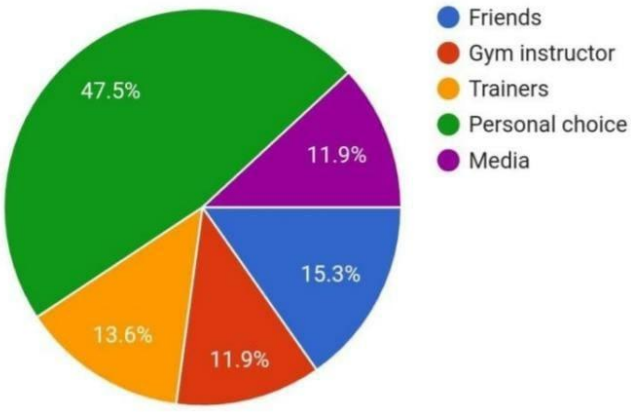
When through questioning was done with the candidates about why they don't consume any supplements 41.9% of them answered that they don't believe in their efficacy on muscle mass and performance while 31.2% of them say that cause the think it is unhealthy. 9.7% of the participants didn't know what protein supplements really are and its benefits. While 17.2 % of them think they are expensive and that they prefer other means of Consuming supplements.



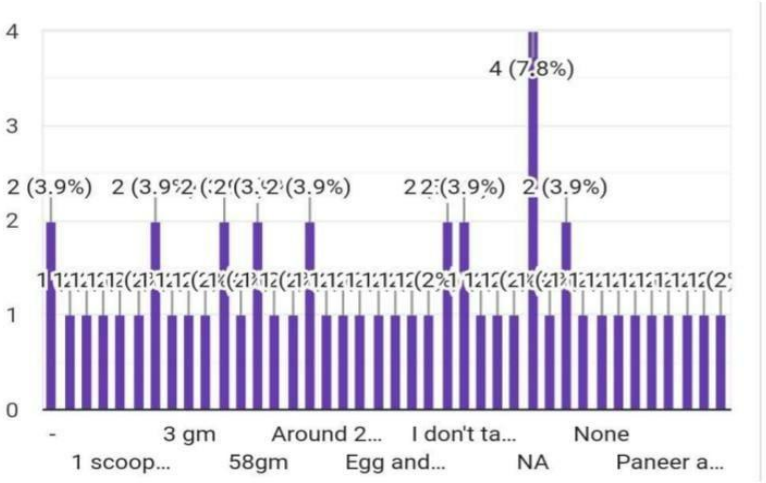
Majority of the candidate's (46.3%) prefer to buy protein powders from nutrition supplements stores. Whereas (33.3%) of the candidates purchase their protein supplements from online stores like Amazon, Flipkart, Nutritarian, D-mart etc.



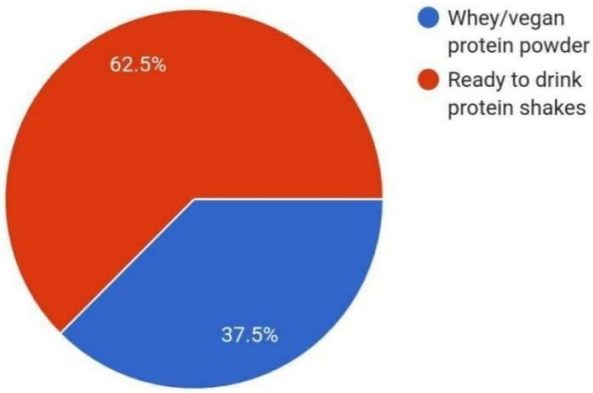
Many of the candidates when asked who inspired or motivated or told you to take-up protein powders/ supplements 47.5% of them answered that it was their personal choice while the rest of the population of candidates were mostly either influenced by social media platforms, trainers, friends, fitness trainers, gym members/ instructors.



The daily intake of the protein supplement varied from individual to individual and thus majority of those were either instructed by the gym members or their personal physicians.

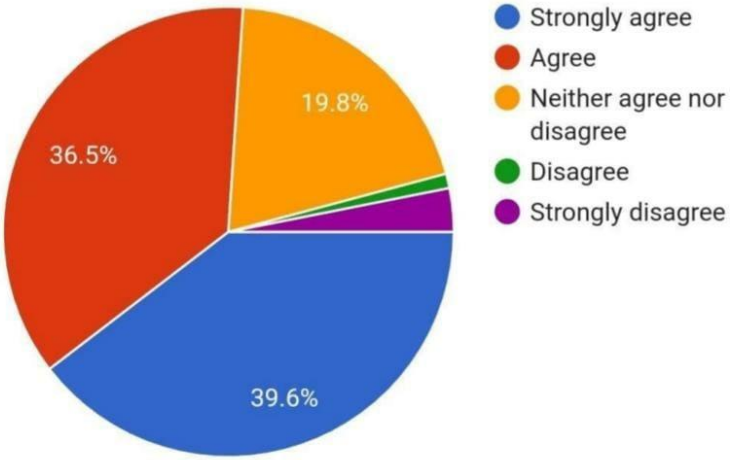


62.5% of the candidates consume ready to drink protein shakes which are readily available in the market, when asked the reason about it majority of them answered that it is a much easier and quicker way of consuming proteins & 37.5 % of the population chosen for this survey intakes whey/vegan protein powder.

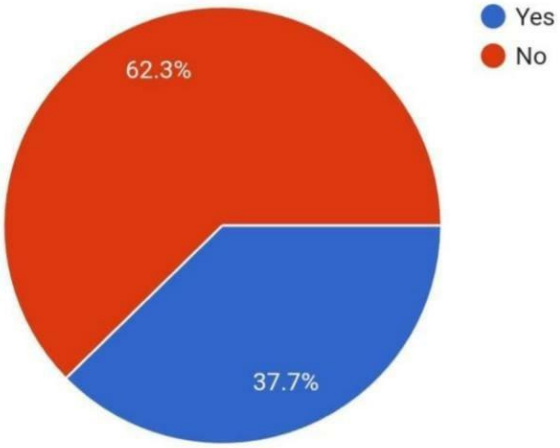


36.5% + 39.6% of the total candidate's i.e., 76.1% of the total candidates agreed that protein powders are

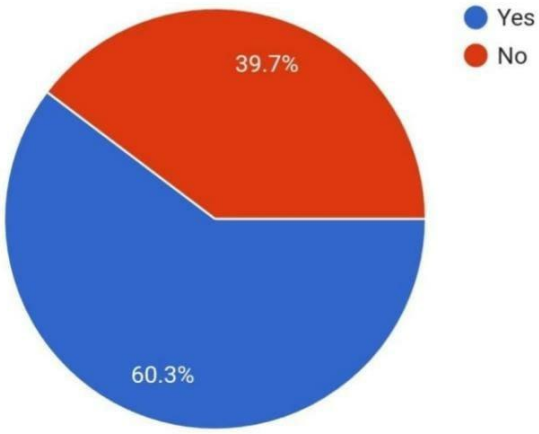
expensive and thus costs a lot of money. It's safe to conclude from this observation from the survey that the majority of the population agrees that protein powders are expensive and thus need to be pocket friendly for the consumers so that it will be consumed and easily available for the people.
Protein powders have an issue when it comes to its flavours as there is limitation to them and the survey also represents it (18.2% + 20.5% = 38.7%) but 29% of the population disagrees on this point as well so it's a debatable topic that are there enough flavours of protein powders in the market or there need to be increase in flavours.



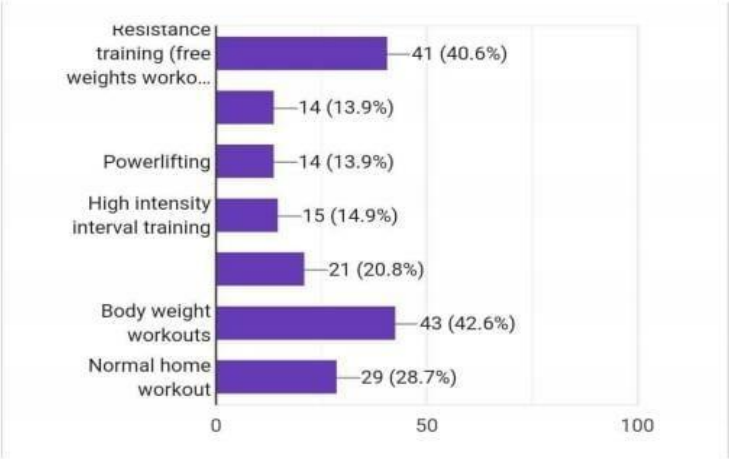
As majority of the protein powder sellers say that there are no side effects of their products 62.3% of the population of the candidates agree to this part as they consume them and they haven't seen any side effects when or after consuming it.



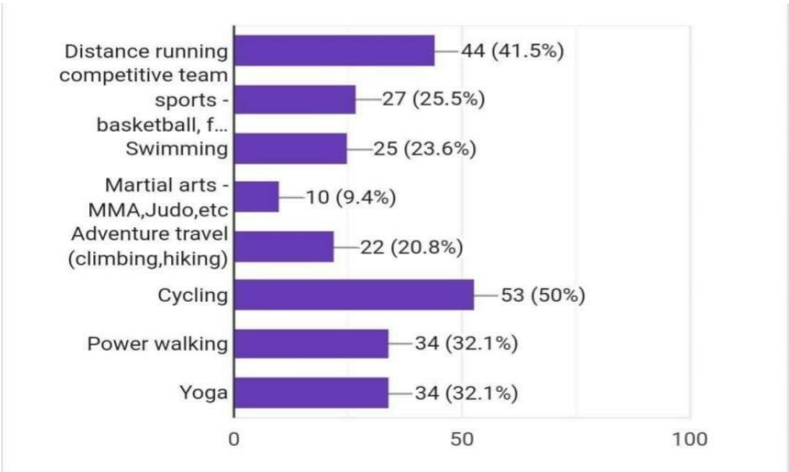
Positive changes have been seen in candidate's health and physique after consuming protein supplements as they say in the survey about 39.7% of them are satisfied with the changes while 60.3% of them haven't



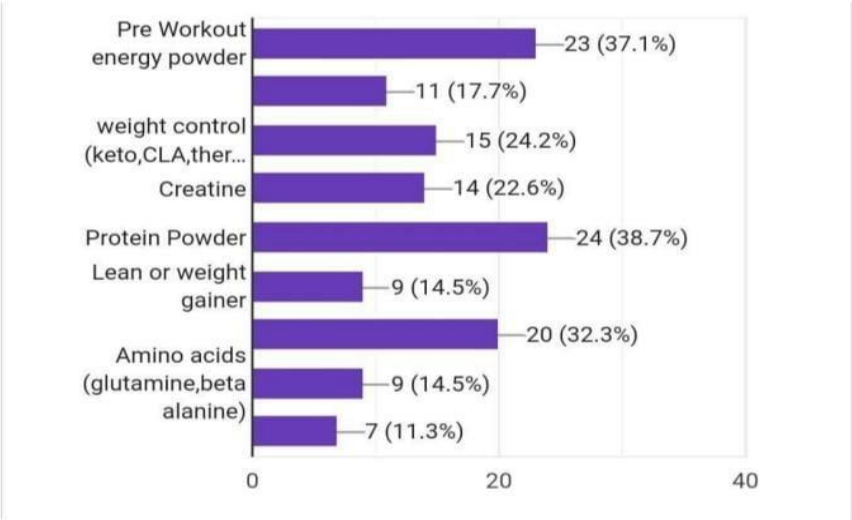
Most of the candidates do body weights workout followed by resistance training followed by normal home workout & then other forms of workout are done.



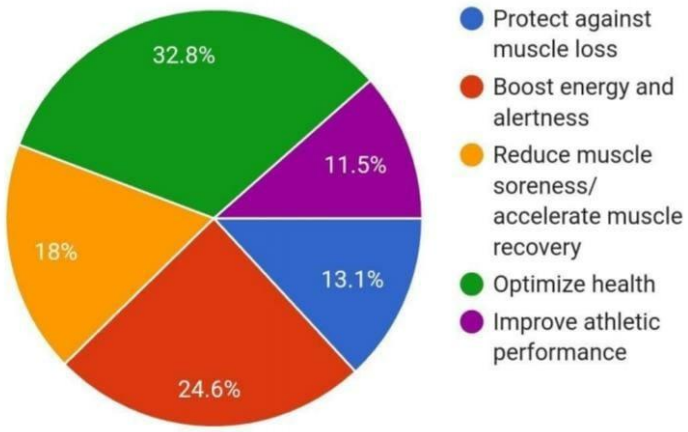
The participants when asked what do they do other than home or gym workout majority of them prefer cycling along with distance running followed by various sports and co-curricular activities such as basketball, martial arts, power walking, yoga, judo, karate, etc.



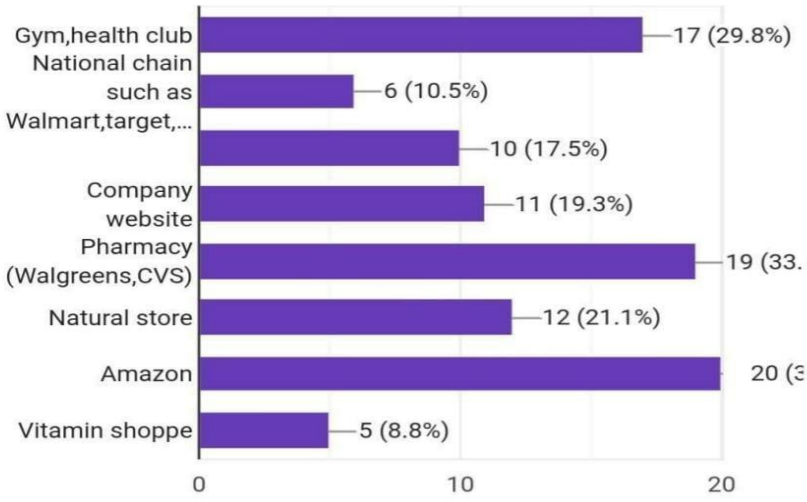
This particular (Which type(s) of nutritional supplements do you use to support your athletic performance and body competition?) a question was asked to the candidates who do heavy or intense workout & again the results vary according to the type of fitness activity they do.



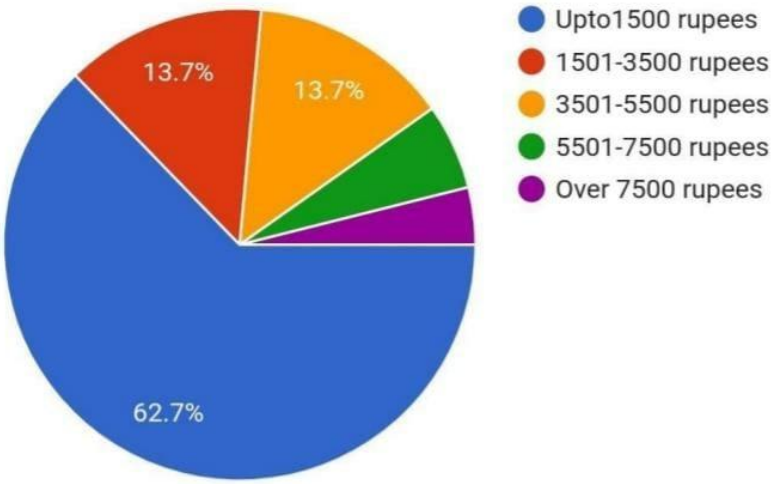
In the survey it was found that 32.8% of the candidates use protein powder for optimizing their health or help them in their daily routine followed by 24.6% of the candidates consume protein powder in order to boost their energy & surprisingly 18% of the candidates use it so as to reduce muscle soreness/accelerate muscle recovery.



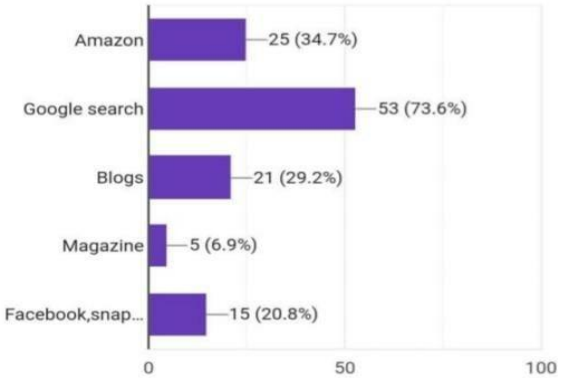
Majority of the candidates usually shop for your protein and sports nutrition supplements from Amazon online store followed by pharmacy retail shops/ wholesalers and then through their gym warehouse followed by some other places like Target, Wal-Mart, D mart, Big Bazaar, online websites etc.



A huge majority of the population spend up to 1500/- Rs. on their sports nutrition and some of them spend more than 7500/- (only 2 people from the 212 candidates)



When asked the candidates (what are your main sources of information about new nutritional products, ingredients and technologies) majority of them do their homework about it by doing a through Google search followed by Amazon stores and their pop-up's and due to growing media influence on everyone many of the candidates search for it on Facebook or Instagram pages of the brands and their products.



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