**Prevalence of the Supplement Use and Consumption Practices among the Gym-Going Population of Nepal**

**ABSTRACT**

**Introduction:** The use of dietary supplements among gym-goers has become increasingly prevalent in Nepal, driven by a growing fitness culture, social influences, and the pursuit of enhanced physical performance.

**Aim:** This study aims to assess the prevalence, types, and patterns of supplement use among the gym-going population in Nepal, as well as the level of awareness and factors influencing supplement consumption.

**Methods:** A cross-sectional survey was conducted among gym members across different cities, collecting data on demographics, supplement usage patterns, sources of information, and perceived benefits or risks. The online questionnaire survey on supplement use among the Nepalese population was made available from the 2nd of July 2023 to the 30th of August 2023, and a link to the online questionnaire was distributed through friend circles and fitness clubs' social network groups in Nepal to reach the target population and reduce bias. An inductive approach was applied to analyze the responses received on the open-ended questions (the reason behind using supplements). The responses obtained for open-ended questions were first arranged and classified into different areas/themes such as 'muscle gain', 'increasing strength', 'prevent nutritional deficiencies’ and ‘fat loss.’ Then, these responses were represented in frequencies and percentages.

**Results:** The findings indicate that a significant proportion of gym-goers rely on protein powders, amino acids, pre-workouts, and fat burners, with many making purchasing decisions based on advice from trainers, peers, or social media rather than certified health professionals. Despite the widespread use, there is limited awareness regarding potential health risks and the authenticity of supplements available in the market. Additionally, regulatory challenges and the availability of counterfeit products pose further concerns. The observation from the study shows the random use of supplements among the study population without proper guidance and consultation, which can also lead to an overdose of supplements and ingestion of illegal ergogenic aids from the contaminated supplement.

**Conclusion:** This study highlights the need for educational initiatives, stricter regulations, and professional guidance to ensure the safe and informed use of supplements among Nepal’s gym-going population.

**Keywords:** Supplement use, gym-goers, Nepal, dietary supplements, fitness practices, health risks, awareness, regulation

**Keywords:** Supplement, protein, creatine, fitness trainer, supplement practice

**1. INTRODUCTION**

The nutritional supplement market on a global scale has experienced a significant expansion, providing a wide range of goods specifically designed for athletes, individuals interested in fitness, and the general populace. The supplements, which come in many formats, including powders, capsules, liquids, and tablets, have been developed to address diverse health and fitness goals (Daher et al., 2022). Strong recent figures support the expansion of the industry. According to a report by Grand View Research in 2022, the market in consideration was valued at US$ 335.24 billion in 2021. It is anticipated to achieve a market size of US$ 624.7 billion by the year 2030, exhibiting a compound annual growth rate (CAGR) of 7.1% (Precedence Research, 2022). The trajectory of this phenomenon is influenced by various factors, such as issues related to malnutrition, shifts in consumption patterns, and an increased awareness of health. Sustainable diets refer to diets with low environmental impacts and positive impacts on food security and health. Considering resource depletion and environmental pollution, it is thought that foods with low environmental impact should be chosen instead of foods with high environmental impact. However, given the high protein consumption of individuals who go to the gym, it is thought that they pose a risk for a sustainable future (Kenger et al., 2024; AlKasasbeh et al., 2024).

Dietary supplements are gaining popularity all over the world for various purposes like recovery, muscle gain, fat loss, and increasing strength and body performance among the athletic population (Karthik & Sonawane, 2017). The scoping review research conducted by Daher et al. (2022) on the prevalence of supplement use in individual and team sport athletes from Spain, the USA and the United Kingdom was found to be 64%, 79% and 53%, respectively. However, the trend of supplement consumption is not limited to the athlete population. A study conducted on Portuguese gym members found a 44% prevalence of supplement use among the total population of 459 participants. The study also found that most supplement users were male (67.2%). Protein powder was mainly used as a supplement (80.1%) after multivitamins (38.3%), sports bars (37.3%), branched chained amino acid (36.8%), and omega three fatty acids (35.5%) (Ruano & Teixeira, 2020). The prevalence was even higher among the gym-going population above 18 years of age in the USA, which was 84.7%, in which vitamins/minerals (45%) along with protein shakes/bars were found to be mainly used supplements. Additionally, it was shown that the participants' preferences for the type of supplement and their motivation for using it were related to their age group. The elderly population preferred taking multivitamins and minerals to prevent themselves from illness; however, the people younger than 45 years and 45 years chose protein to enhance their muscle growth, and the people younger than 30 years were also consuming creatine for muscle growth (Morrison et al., 2004). Moreover, 82% of participants were found to use supplements at least once a week in the research conducted by Mettler et al. among Swiss fitness center users. According to this study, the most consumed supplements were protein (49%), magnesium (34%), and multi-micronutrient supplements (31%). Additionally, most of the participants (28%) were found to be influenced by a coach/trainer, followed by supplement seller’s website (26%) and their training peers (24%) to take supplements (Mettler et al., 2020). Although there are various studies on the prevalence of supplement use and supplement practices in Western, European, and Middle-Eastern countries, there is very little research conducted in South Asian countries, and research has been reported till now on the prevalence of supplement use among the gym-going population in those countries. The rate of supplement consumption in the study conducted by Karthik & Sonawane among 100 gym Indian-going population was found to be 84% of total gym users, which is quite similar to the study conducted in the gym-going population in the USA (Karthik & Sonawane, 2017). Although there are various studies on the prevalence of supplement use and supplement practices in Western, European, and Middle-Eastern countries, there is very little research conducted in South Asian countries, and research has been reported till now on the prevalence of supplement use among the gym-going population in those countries

The rate of supplement consumption in the study conducted by Karthik & Sonawane among 100 gym Indian-going population was found to be 84% of total gym users, which is quite similar to the study conducted in the gym-going population in the USA (Karthik & Sonawane, 2017). Another research study on the Pakistani gym-going population reported that 68.9% of the gym-going population in their study were using supplements (Ahmer & Rabab, 2022). Nepal, being one the South Asian country and neighbors India and Pakistan, have a high prevalence of supplement use among the going population. Moreover, there have been no records or research on supplement use among the Nepalese gym-going population. So, the main aim of this research is to study the prevalence of supplement use and supplement practice among the gym-going population of Nepal. There might be various reasons behind supplement consumption among the gym-going population. In most of the research, males were found to dominate the use of supplements. Besides this, the males and females were found to have differences in the preference type of supplement in the study conducted among 512 exercising populations in Beirut city. Out of 187 supplement users, the study found that 70 % of supplement users were male, and supplements like protein and Creatine, which aid in muscle growth, repair, and performance enhancement, were found to be preferred by males and young people, whereas supplements like vitamins and minerals were the first choice among females (30%) (El Khoury & Antoine-Jonville, 2012).

El Khoury & Antoine-Jonville's (2012) study on supplement use by the gym-going population revealed that 78% of supplement users never consulted a nutritionist or dietician about the supplement, which creates a gap in the flow of correct information on the safe dosages and possible side effects of supplement among the users. The main reason behind the lack of knowledge or misleading information about supplements was found to be related to the source of the supplement information. The gym-going population was found to be influenced by their coaches and fitness trainers, as well as information/advertisements on the internet, television, and magazines. Similarly, the study by Conner et al. on 177 female supplement users also found that the participants were highly influenced by the advertisements and claims made by supplement producers on magazines, televisions, and internet platforms (Conner et al., 2003). The media might be one of the major driving forces behind the use of supplements because people have easy access to them, and media platforms are used excessively these days. The identification of the supplement practices might help mitigate the random use of unnecessary supplements among the gym-going population. Apart from this, the study conducted among 1102 gym-going populations in Brazil found that the maximum number of consumers (55%) took the supplement without guidance (Goston & Correia, 2010). The media might be one of the major driving forces behind the use of supplements because people have easy access to them, and media platforms are used excessively these days. The identification of the supplement practices might help mitigate the random use of unnecessary supplements among the gym-going population. Apart from this, the study conducted among 1102 gym-going populations in Brazil found that the maximum number of consumers (55%) took the supplement without guidance (Goston & Correia, 2010). The inappropriate, incomplete, and false information about supplements obtained from unauthorized means like coaches, personal trainers, social media, and friends can lead to the unnecessary use or overuse of supplements. Moreover, Troesch et al. (2012) claim that the overdose of supplements like protein, fatty acids, and other performance-enhancing drugs may cause kidney damage, liver damage, defects in muscle protein formation, and endocrine disorders. The use of some ergogenic supplements is prohibited or limited to a specific dose by the sport’s governing organization because those supplements affect the health of the consumer, and they also give unfair advantages to the consumer, which is ethically not right (Maughan, 1999). In addition, supplements contaminated or adulterated with undeclared ergogenic substances like stimulants or anabolic can increase their efficacy. The undeclared substances in supplements might also be prohibited by the World Anti-Doping Agency (WADA), which is an illegal and morally wrong thing to consume by any athlete (Walpurgis et al., 2020).

The outcome of this study will find out the prevalence of supplement use and supplement practices among the Nepalese gym-going population, which will provide actionable insights that can provide the information for the formulation of targeted strategies for various stakeholders. Besides this, it can also aid individual gym-goers in making informed decisions, enable fitness professionals to tailor guidance more effectively and help policymakers create contextually pertinent policies on supplement use.

* 1. **Research question**

The research question of this study:

* + 1. What is the prevalence of supplement use among the gym-going population in Nepal?
		2. What kind of supplement practices are prevalent among the gym-going population in Nepal?

**2. METHODOLGOY:**

**2.1 Participants:**

100 Nepalese gym-goers who completed a research questionnaire were selected as the study population, which is in accordance with the study by Karthik and Sonawane (2017) on the gym-going population in the Thane district of India. This study in India was chosen as a reference because the population is from one of the South Asian countries and one of the neighboring countries of Nepal. The gym-going Nepalese population of all genders and ethnic groups aged between 18 and 60 years of age who exercise in the gym at least twice a week were recruited for the study from all over Nepal. The age of the participants was verified by the age provided by participants while filling out the questionnaire. The participants who did not reside in Nepal during the survey were excluded. The responses from those participants who did not complete the questionnaire or provide consent were not recorded and were not used in the study. The convenience sampling method was used for the sample selection (Nepalese gym-going people between 18 and 60 years of age) in this study.

* 1. **Measures:**

Data and information regarding the prevalence of supplement use and influencing factors behind their use were collected by using an online questionnaire survey**.** The self-administered structured questionnaire was prepared by modifying the questionnaire used in a similar type of previous study conducted in Lebanon (El Khoury & Antoine-Jonville, 2012). The structured questionnaire was prepared using Google Docs for an online survey, which was comprised of scaled, ranked, and open-ended questions. The questionnaire was made available in both English and Nepali to make it easier for participants to understand the questions. The frequencies of supplement use among different genders, age groups, and types of supplement use were obtained by scaled and ranked questions, and open-ended questions were included to acquire detailed information about supplement use and practices on supplement use. The questions included in the questionnaire concerning the demographic characteristics (age, sex and education level), lifestyle (frequency of exercise, type of exercise, medical condition, and any specific diet ) and supplement use (frequency and history of their supplement use, type of supplement they have been using, reasons for using supplement, source of information about supplement, influencing factor for supplement use, side effect of supplement use, accessibility of supplement and their perception on supplement use). The questionnaire also comprised open-ended questions to gather more information regarding the reason behind using supplements. Before sending the prepared questionnaire for the online survey, a pilot study was conducted among 10 gym-goers who were not allowed to participate as a sample population later in the study to avoid bias and manipulation in the response. After the pilot study, further changes were made, and an improvised questionnaire was sent for the online survey.

**2.3 Procedure:**

The cross-sectional descriptive study method was adopted to conduct the study. The online questionnaire survey on supplement use among the Nepalese population was made available from the 2nd of July 2023 to the 30th of August 2023, and a link to the online questionnaire was distributed through friend circles and fitness clubs' social network groups in Nepal to reach the target population and reduce bias. The approval letter from the St. Marys University Ethics Committee was taken before starting the online survey. Informed consent was obtained from the participants to participate in the survey study voluntarily. The form was created so that those failing to provide consent were recorded by the electronic form as "I Decline" and did not have further access to the electronic questionnaire. After reading the information, those who accepted to participate chose "I Accept" and were forwarded to the questionnaire. All the questions in the questionnaire were mandatory, and in the case of predefined answers in the question, the open-ended question was added for individual responses. For example, if they answer yes/no to the question about the benefits of supplements, there is a section called 'give a reason why' to explain their answer. The spare line with the 'If other specify' notation is added to the questionnaire for the answers that are not included in the option. In total, 130 people participated in the survey. Out of that, only 100 eligible participants were chosen as the study population. Participants who failed to complete the form did not engage in at least two days of weekly exercise in the gym or were less than 18 years old and more than 60 years old were not included in the study.

**2.4 Data Analysis:**

Data analysis was done by using the Microsoft Excel sheet, and data were presented in frequencies and bar diagrams. An inductive approach was applied to analyze the responses received on the open-ended questions (the reason behind using supplements). The responses obtained for open-ended questions were first arranged and classified into different areas/themes such as 'muscle gain', 'increasing strength', 'prevent nutritional deficiencies’ and ‘fat loss.’ Then, these responses were represented in frequencies and percentages.

**3. RESULT:**

* 1. **Demographic characteristics**

**Table 1:** Demographic characteristics of respondents

|  |  |  |
| --- | --- | --- |
| **Variables** | **Total Participants of the study****(n=100)** | **Supplement users** |
| **Gender** |  |  |
| Male | 75(75%) | 21(84%) |
| Female | 25(25%) | 4(16%) |
| **Education level** |  |  |
| Master’s level or above | 33(33%) | 3(12%) |
| Bachelor level | 47(47%) | 15(60%) |
| Diploma | 4(4%) | 1(4%) |
| High school | 15(15%) | 6(24%) |
| Illiterate | 1(1%) | 0 |
| **Age group** |  |  |
| 18-29 years | 51(51%) | 13(52%) |
| 30-45 years | 49(49%) | 12(48%) |
| **Training frequency (per week)** |  |  |
| 2-4 days | 34(34%) | 6(24%) |
| 5-6 days | 66(66%) | 19(78%) |
| **Type of Exercise** |  |  |
| Aerobic | 11(11%) | 2(8%) |
| Resistance/weight training exercise | 21(21%) | 8(32%) |
| Mixed (both aerobic and weighttraining) | 68(68%) | 15(60%) |

 *Source: Online survey from July 2, 2023 to August 30, 2023*

Table 1 demonstrates that 25% of the total population (n=100) were using supplements; among them, 84% were male. There was nearly equal participation of people from the 18-29 years age group

 11 and the 30 to 45 years age group. Though the study was conducted among the gym-going population aged between 18 and 60 years, there were not any participants aged above 45 years. A higher percentage (52%) of the study population between 18 and 29 years of age were found to be supplement consumers in the study. In this study, 66% of the total participants (n=100) were found to be training 5 to 6 days a week, and 78% of them were found to be a supplement user. Along with that, a combination of aerobic and weight training exercises was found to be the most followed exercise among the total study population (n=100) and supplement users (n=25). A higher percentage (47%) of the study population was found to have completed their bachelor-level education, whereas only 1% of the study population was found to be illiterate.

* 1. **Types of supplements used:**

**Figure 1:**Types of Supplements used by participants in percentage.

**Types of supplement**

Ashwagandha

Glutamine Vitamin D

BCAA

Multivitamin Fat cutter Post-workout

Fish oil Creatine

Whey protein

4

4

12

4

16

4

4

20

28

88

0

20

40

60

80

100

**Percentage of supplement users (%)**

 *Source: Online survey from July 2, 2023 to August 30, 2023*

Figure 2 illustrates the types of supplements used by the supplement users in the study. It was found that whey protein is the most consumed supplement (88%) after Creatine (28%), Fish oil (20%), multivitamins (16%) and Vitamin D (12%). 40 % of the supplement users were using more than one supplement, and 12% of them were even found to use five supplements at a time. According to the study, most of the females (75%) were using multivitamins and omega-3, whereas whey protein was found to be popular among male supplement users.

Furthermore, 60% of the supplement users were found to be new users of the supplements (had been using the supplements for a few months), while 32% of users reported using the supplements for more than a year. In addition, only 8% of the supplement users experienced side effects from the supplement use.

12

* 1. **Reasons behind supplement use:**

Among the 100 participants in the study, 53% agreed that supplements are beneficial, but only 25% of the total population used supplements. When asked about the reason behind their use, 56 % of the supplement users consumed supplements for muscle gain. At the same time, some also answered that supplements help them improve strength (20%), prevent nutritional deficiencies (20%), and lose fat (4%).

Figure 2**:** The reason behind supplement use.

**Reasons behind supplement use**

Weightloss

4

Prevent nutritional defeciencies

20

Muscle gain

56

To improve strength

20

0

20

40

60

**Percentage of supplement users (%)**

*Source: Online survey from July 2, 2023 to August 30, 2023*

Moreover, 40% of supplement users responded that their fitness trainer influenced them to take supplements, and 32 % of them started taking supplements without being influenced by anyone. In addition, 12% of the supplement users were found to be influenced by fitness influencers, and only 16% of them were found to take supplements after being prescribed by their doctor or dietician.

**3.4 Source of information:**

The study revealed that most supplement users (40%) relied on the information provided by their trainers, and 36% gained knowledge about supplements through self-study and research. However, only 16% consulted a dietician about the supplement, and 4% relied on social media to learn about it.

**4. DISCUSSION**

The study's main aim was to determine the prevalence of supplement use among the gym-going population of Nepal and supplement practices among them. The key finding from the study showed that only 25 % of the study population was using the supplements. This prevalence of supplements among the Nepalese gym-going population differs from previous research as the prevalence of supplement use in the study was comparatively less than in the European, Western and Middle Eastern countries. The study conducted in Switzerland reported the prevalence of supplement use among gym goers to be 82% among Swiss fitness centre users (Mettler et al., 2020), and the prevalence of supplement use was found to be 60% in the going population of Saudi Arabia (Al-Saeed et al., 2020). The reason behind the vast difference in supplement use might be the affordability of supplements. Although 54% of the study population reported supplements being beneficial, only 25% of the study population were using supplements. Moreover, 94% of the study population also responded that supplements were not affordable due to their high cost. In contrast to this finding, the study by Goston and Correia, in 2010, revealed that supplement users considered the cost of supplements affordable. However, the amount spent on supplements was 20% of their national minimum wage, and the prevalence of supplement use in the study was found to be 36%. Furthermore, the reason behind the discrepancies in the prevalence of supplement use in different countries can also be the differences in demographic characteristics, socioeconomic characteristics, false/biased information provided on supplement consumption, or differences in the method of data collection used in different research (Al- Saeed et al., 2020).

However, the prevalence of supplement use among the 293 Nepalese taekwondo players was found to be even lower (7.17%) in the study conducted by Sunuwar et al. (2022) and this status of low supplement intake among the Nepalese taekwondo players linked to the majority of player (64.85%) with a low level of nutritional knowledge score and nutritional practice. So, the low level of nutritional knowledge and nutritional practice can also be the reason behind the surprisingly lower rate of prevalence of supplement use among the Nepalese gym-going population.

The use of supplements was found to be 84% in the male study population. The reason behind this might be the minimum participation of females (25%) in the study. This same trend of the majority of supplement use by the male population was also reported in the study conducted by Al-Saeed et al. in Saudi Arabia. The study was conducted on 250 Saudi Arabian gym-going population, of which only 27.1 % were female participants. The result from the study found that 60% of the total study were supplement users, and only 26.6 % of them were female (Al-Saeed et al., 2020).

Most supplement users were found to exercise 5-7 days a week. The 60% of supplement users who spend most of their time (5-7 days a week) in the gym were found to be using more than one supplement at that time. A Similar trend was found in the study conducted among gym users in 3 countries (Italy, Turkey and the UK) by Ewan et al. (Ewan et al., 2019). The study also reported a similar trend, which found that 75% of supplement users were exercising 5-7 days a week. When people spend most of their time in the gym regularly (5-7 days a week), there are higher chances of exposure to sport, fitness and supplement-related information. They will also get more time to interact with their fitness coach, personal colleagues and other gym users, which increases the flow of information related to fitness issues, supplements, and workouts (El Khoury & Antoine-Jonville, 2012).

The study also revealed that 60% of the supplement users followed a combination of aerobic and weight-training exercise regimes. However, in contrast to this finding, supplement use was usually found among participants who were involved in promoting strength and performance-enhancing exercises like weightlifting and powerlifting. The study on 512 gym-going people in the Middle East found that a larger number of supplement users were engaged in strength training exercises that emphasize muscle development and strength (El Khoury & Antoine-Jonville, 2012). The use of ergogenic supplements like whey protein (88%) and Creatine (28%) was more popular than dietary supplements like multivitamins and minerals. When asked about the reason behind the supplement use, 56% of the participants answered that muscle gain/growth was their reason behind supplement use. They consumed either Creatine or whey and, in some cases, both Creatine and whey protein, which is the apparent reason since most supplement users were male (75%).

The interest of the male population in esthetical and bigger muscles has been prevalent since ancient times (Goston & Correia, 2010). A similar observation was noticed in the study conducted in India in which 82% of the study population was found to use only protein supplements, and 52% of them were using both creatine and protein at the same time (Karthik & Sonawane, 2017). The study by Al-Saeed et al. in 2020 found a higher prevalence of multivitamin and omega-3hree consumption among the male population. In contrast to the study by Al-Saeed et al., this study found the maximum consumption of vitamins and omega-3 among the female population.

Furthermore, 40% of supplement users were found to use more than one supplement, with the use of whey protein and creatine found to be the most popular supplements. The study population were found to use glutamine, ashwagandha, vitamin D, BCAA (Branched Chain Amino Acid), multivitamins, fat cutter supplement, post-workout supplement and fish oil/ omega three along with whey protein and creatine. Though there are very few scientific studies to back up the alleged advantages of supplement intake, people still believe that supplements provide energy, prevent disease, aid in weight loss, encourage the growth of lean muscle or boost athletic performance (Goston & Correia, 2010). The consumption of more than one supplement can be an unnecessary overuse of the supplements due to the lack of understanding of supplement use and supplement toxicity.

Whey protein and creatine were found to be the most used supplements in this study, and 4% of the supplement users were reported to experience side effects like face acne and upset stomach. The systematic review on whey protein supplementation and its potential effect on health found that the overconsumption of whey protein can lead to kidney and liver diseases, an increase in aggression (emotional imbalance) and acne among its users (Vasconcelos et al., 2021). However, there is no evidence to prove the side effects of creatine supplements on the health of consumers until now (Maughan, 1999).

In the context of the source of information about the supplement, the majority of the supplement users (40%) were found to rely on their personal trainer, but only 16% of them were found to consult a dietician before using the supplement. The study by EI Khoury & Antoine-Joinville (2012) and Karthik & Sonawane (2017) also reported that a higher percentage (44.68% and 47% respectively) of their study population chose their fitness trainer /coaches for information related to supplements over the certified nutritionist or dietician. The reason behind this observation can be limited access to the dietician/ nutritionist to the gym-going population and the absence of the dietician/nutritionist in the fitness centers and gym. Besides this, 36% of the supplement users started using supplements without any consultation or help from another person. This outcome is in line with the result of the study by Goston & Correia (2010), in which 34.1% of supplement users were consuming supplements without any guidance and consultation. The probable reason for this might be the higher influence of social media and easy access to social media platforms and televisions. The information from the unauthorized sources like social media and magazines increase the chances of unauthorized promotional commission-based advertisements of supplements without any proven scientific information. This observation from the study shows the random use of supplements among the study population without proper guidance and consultation, which can also lead to an overdose of supplements and ingestion of illegal ergogenic aids from the contaminated supplement. The need of proper nutrition education and awareness among gym going population can be observed from this study

**CONCLUSION**

In conclusion, the prevalence of supplement use in Nepalese gym goers was very low compared to the previous studies conducted in neighboring Asian countries (India and Pakistan) and European and Middle Eastern countries. The majority of the supplement users were found to be male. The study revealed that whey protein was mainly used as a supplement, and most gym goers were found to use supplements for muscle gain. Besides this, a maximum percentage of gym goers were found to rely on their coach/fitness trainer for information related to supplements. This evidence from the study highlights the necessity of the proper training and awareness program for fitness trainers/ coaches in order to provide accurate and evidence-based information about supplement use.

**Recommendation:**

The study can be a baseline and foundation for conducting various research on the use of suspended use among the gym-going population of Nepal. A qualitative research focus group discussion can be conducted to determine the reason for the lower prevalence of supplement use in the Nepalese gym-going population. In addition, studies on nutritional education and supplement use can be conducted among Nepalese coaches and fitness trainers since most of the study population relies on coaches and fitness trainers for information about supplement use. Besides this, the research on the factors associated with supplement use among the Nepalese population can be conducted using this study as a guide.

**Limitation:**

The study had few limitations. Firstly, there was inherent bias with the online questionnaire, and the questionnaire used in the study was not validated. However, the study questionnaire was prepared by modifying the questionnaire used in the previous study on the going population conducted in Lebanon, and a pilot study was conducted using the prepared questionnaire before starting the research (El Khoury & Antoine-Jonville, 2012). In addition to this, the number of female supplement users is very low compared to the male population. That is why the results were expressed as percentages to standardize the data. However, a larger sample size will be required to evaluate the supplement use accurately in the Nepalese female gym-going population.

**Ethical Approval:**

The approval letter from the St. Marys University Ethics Committee was taken before starting the online survey.

**Consent:**

Written informed consent was obtained from the participants to participate in the survey study voluntarily.

**Disclaimer (Artificial intelligence)**

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1.

2.

3.

**REFERENCES**

Ahmer, Z., & Rabab, U.-. (2022). *The Frequency & Determinants of the Use of Nutritional Supplements and Hormones among Selected Gym Users in Karachi, Pakistan The Frequency & Determinants of the Use of Nutritional Supplements and*. *November*. https://doi.org/10.55951/nurture.v16i1.105

Al-Saeed, A., Almaqhawi, A., Al-Saeed, A. A., & Ibrahim, S. (2020). Nutritional Supplements Intake by Gym Participants in Saudi Arabia: A National Population-Based Study. *International Journal of*

*Pharmaceutical and Phytopharmacological Research*, *10*(February 2021), 3–43. [www.eijppr.com](http://www.eijppr.com/)

Conner, M., Kirk, S. F. L., Cade, J. E., & Barrett, J. H. (2003). Environmental influences: Factors influencing a woman’s decision to use dietary supplements. *Journal of Nutrition*, *133*(6), S1978–S1982. https://doi.org/10.1093/jn/133.6.1978s

Daher, J., Mallick, M., & El Khoury, D. (2022). Prevalence of Dietary Supplement Use among Athletes Worldwide: A Scoping Review. *Nutrients*, *14*(19). https://doi.org/10.3390/nu14194109

El Khoury, D., & Antoine-Jonville, S. (2012a). Intake of nutritional supplements among people exercising in gyms in Beirut city. *Journal of Nutrition and Metabolism*, *2012*(May 2014).

https://doi.org/10.1155/2012/703490

Ewan, T., Bettina, K., Fatma Nese, S., Goktug, E., Francesco, M., Vincenza, L., Antonio, P., Paulo, G., Antonio,

P., & Antonino, B. (2019). Protein supplement consumption is linked to time spent exercising and high-protein content foods: A multicentric observational study. *Heliyon*, *5*(4).

https://doi.org/10.1016/j.heliyon.2019.e01508

Goston, J. L., & Toulson Davisson Correia, M. I. (2010). Intake of nutritional supplements among people exercising in gyms and influencing factors. *Nutrition*, *26*(6), 604–611.

https://doi.org/10.1016/j.nut.2009.06.021

Karthik, S., & Sonawane, B. (2017). *Knowledge and Use of Dietary Supplements in Gym Going Population of Thane District, India*. *June*. https://doi.org/10.15680/IJIRSET.2017.0605291

Maughan, R. J. (1999). Nutritional ergogenic aids and exercise performance. *Nutrition Research Reviews*, *12*(2), 255–280. https://doi.org/10.1079/095442299108728956

Mettler, S., Bosshard, J. V., Häring, D., & Morgan, G. (2020). High prevalence of supplement intake with a concomitant low information quality among Swiss fitness centre users. *Nutrients*, *12*(9), 1–13. https://doi.org/10.3390/nu12092595

Morrison, L. J., Gizis, F., & Shorter, B. (2004). Prevalent use of dietary supplements among people who

exercise at a commercial gym. *International Journal of Sport Nutrition and Exercise Metabolism*, *14*(4), 481–492. https://doi.org/10.1123/ijsnem.14.4.481

Precedence Research, 2022. Nutritional Supplements Market (By Form: Powder, Tablets, Capsules, Liquid, Soft gels, and Others; By Product Type: Sports Nutrition, Dietary

Supplements, Fat Burner, Functional Food, and Others; By Age Group: Kids, Adults, and Geriatric; By Distribution, s.l.: Precedence Research.

Ruano, J., & Teixeira, V. H. (2020). Prevalence of dietary supplement use by gym members in Portugal and associated factors. *Journal of the International Society of Sports Nutrition*, *17*(1), 1–8. https://doi.org/10.1186/s12970-020-00342-z

Sunuwar, D. R., Singh, D. R., Bohara, M. P., Shrestha, V., Karki, K., & Pradhan, P. M. S. (2022). Association of nutrition knowledge, practice, supplement use, and nutrient intake with strength performance among Taekwondo players in Nepal. *Frontiers in Nutrition*, *9*, 1–22.

https://doi.org/10.3389/fnut.2022.1004288

Walpurgis, K., Thomas, A., Geyer, H., Mareck, U., & Thevis, M. (2020). Dietary supplement and food contaminations and their implications for doping controls. *Foods*, *9*(8), 1–21. https://doi.org/10.3390/foods9081012

Vasconcelos, Q. D. J. S., Bachur, T. P. R., & Aragão, G. F. (n.d.). *Whey protein supplementation and its potentially adverse effects on health: a systematic review*. Applied Physiology, Nutrition, and Metabolism. https://doi.org/10.1139/apnm-2020-0370

Kenger, E. B., Aydın, Ö., Balkan, C., İşcan, E., Erol, E., & Türkmen, T. B. (2024). Assessment of sustainable nutrition practices among individuals attending the gym. *Frontiers in Life Sciences and Related Technologies*, *5*(3), 203-209.

AlKasasbeh, W., Shlool, H., & Alnaimat, S. (2024). Anabolic steroid consumption among gym-goers in Amman: knowledge, attitudes, and behaviors. *Frontiers in Sports and Active Living*, *6*, 1404551.

**APPENDIX : Self-administrated questionnaire for online survey**

**Instruction:**

Please click on the relevant options given in the questionnaire or type your answer where the option is not given.

Please fill questionnaire by yourself provide us your own opinion without any help of second person so that the study can be non-biased and effective.

|  |  |  |
| --- | --- | --- |
|  | **Questions** | **Possible Answers** |
| 1 | Please, indicate your gender. | * Male
* Female
 |
| 2 | Please, indicate your age. | *Indicate the number* |
| 3 | Please indicate your education level | * Not educated
* High school
* Diploma
* Bachelor
* Master or above
 |
| 4 | Do you have any medical condition requiring the use of dietary supplements as therapy? | * Yes
* No
 |
| 5 | Are you a gym user involved in body shaping- oriented workouts? | * Yes
* No
 |
| 6 | If so, for how long? | * Less than 1 year
* More than 1 year
 |
| 7 | How many days do you train a week? | *Indicate the number* |
| 8 | What kind of training do you practice? | * Resistance/weight training
* Aerobic/cardiovascular training
 |

|  |  |  |
| --- | --- | --- |
|  | **Questions** | **Possible Answers** |
|  |  | * Mixed training
* If other specify……………
 |
| 9 | What is your reason behind exercising? | * Muscle gain
* Fat loss
* Increasing strength
* Body building
* Body fitness

if other specify…... |
| 10 | Have you been following any specific diet for your fitness goal? | * Yes
* No
* If yes which one and why explain…………….
 |
| 11 | Do you use dietary supplements? | * Yes
* No
 |
| 12 | How many dietary supplements do you use? | *Indicate the number* |
|  |  |  |
|  |  | Supplement | Purpose for using |
|  |  | Vitamin |  |
|  |  | Mineral salts |  |
| 13 | Please indicate the type of dietarysupplements you use. *(Multiple choices are allowed)* and give reason why you use this | Branched -chain amino acid (BCCA)  Essential amino acid |  |
|  | particular supplement. | Creatine |  |
|  |  | Why proteins |  |
|  |  | Hydroxymethylbutyrate (HMB) If other,Specify…………. |  |

|  |  |  |
| --- | --- | --- |
|  | **Questions** | **Possible Answers** |
| 15 | How long have you been taking supplement? | * Less than a year
* 1 year
* More than a year
 |
|  |  | * Personal trainer
 |
|  |  | * Dietician
 |
|  |  | * Doctor
 |
| 16 | How did you learn about supplements?*(Multiple choices are allowed)* | * Social media
 |
|  |  | * Advertisement
 |
|  |  | * Self-knowledge/research
 |
|  |  | If other specify…………… |
|  |  | * Personal trainer
 |
|  |  | * Dietician
 |
|  |  | * Doctor
 |
|  |  | * Social media
 |
| 17 | Who influenced you to take supplements?*(Multiple choices are allowed)* | * Fitness influencer
 |
|  |  | * Advertisement
 |
|  |  | * Self-motivation
 |
|  |  | * Other
 |
|  |  | If other specify…………… |
| 18 | Do you think supplements have benefits? | * Yes
* No

Give reason why……………… |

|  |  |  |
| --- | --- | --- |
|  | **Questions** | **Possible Answers** |
| 19 | Have you experienced any discomfort or side effect while using supplement? | * Yes
* No

If yes, specify…………………. |
| 20 | Do you think supplements are affordable? | * Yes
* No

Give reason why…………….. |

Thank you for your participation!