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Knowledge and Attitudes of Protein Supplements Used Among Benghazi Gym Trainers

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ABSTRACT

Protein supplements are commonly utilized by everyone, from casual exercisers to highly skilled athletes, to enhance health and athletic performance. This study aimed to investigate the use of protein supplements among Benghazi gym users and examine their knowledge and attitudes toward protein supplement use. A cross-sectional study was conducted in a period between March and June 2023 at users of gyms in Benghazi, Libya. 240 participants in all, including 162 were males and 78 were females, were selected randomly from eight different gyms. A self-administered, validated, and pretested questionnaire was used. It contained items connected to personal information, the incidence, knowledge, attitudes, and practice of protein supplementation. The results showed that 68 % of respondents who took protein supplement were males and 32 % were females. They consumed between a scoop or two of supplements daily by 44.2% and 41% of participants took protein to maintain a good body shape. Coaches encouraged over 47.5% of the participants to use supplements containing protein. 68% of participants showed good knowledge and attitudes about protein supplement use and 77% of them were males and 23% were females. 50.4% of participants at fitness centers used the gym three times per week. Conclusions: in this research, individuals who used gyms showed positive attitudes and good understanding regarding taking protein supplements. There was also a significant correlation found between participants' daily protein calculations and their educational level.

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1. Introduction

Dietary supplements (DS) are products with dietary components such as vitamins, minerals, amino acids, botanicals or herbs, and other substances, and they add additional nutritional value to the diet (1). The usage of DS has been increasing since the 1970s (2), and there is a wealth of information on its widespread usage in many different nations (2,3). However, there is a consensus dearth regarding the security and effectiveness of DS therapy, prevention, or management in populations that are nutrient-replete (4). In addition, dietary supplements play a vital role in preserving health as a diet delivers essential nutrients, while supplements complement the diet as they allow replacement of any deficiencies the diet lacks (5). There has been an increasing use of nutritional supplements by people who participate in physical activities (6). Supplement use among athletes is well documented. It was estimated to range from 40 to as high as 88% (7,8). According to earlier research, proteins are the most commonly consumed supplements among physically active individuals. A previous study carried out in Baghdad city reported that the most common supplements used were mass protein (35.9%), followed by whey protein (29.3%), and creatinine (15.1%) (9). Another study carried out in Lebanon found that about 80% of the dietary supplement users reported consuming whey protein as a protein supplement, with a higher prevalence among men than women (10), Moreover, previous study carried out in Saudi Arabia have reported that nearly 50% of the participants consumed protein supplements (1). There are several places to obtain information regarding supplement use; yet, depending on the study results conducted in Lebanon, the primary source of information is coaches for users (11). Numerous studies have indicated that coaches are the primary individuals who advise users to utilize protein supplements (12,13). There are several studies assessing knowledge and attitudes of protein supplements used by gym trainers. Eelier study conducted in Saudi Arabia reported that the participants appeared to be knowledgeable about protein supplements (1). Other study carried out in United Arab Emirates found that public need to educate of responsible use of dietary supplements (14). Another previous study has shown that less than 40% of athletes had the knowledge about the proper and intended use of protein, creatine, amino acids, beta alanine and glutamine (15). Moreover, study carried out in Tehran, Iran According to the results, the adolescent athletes aged 15 -18 years in Tehran did not have sufficient sports nutrition knowledge and attitude (16).

In Libya, DS are commonly available in the market with poor guidance and regulations. However, there is insufficient data on DS consumption in Libya (17). Our study is the first to investigate the use of protein supplements among Benghazi gym users and examine their knowledge and attitudes toward protein supplement use.

2. Methodology

2.1 Design of the Study and Selection of Participants

The cross-sectional investigation was carried out in Benghazi, Libya over 3 months from March to June 2023 on users of gyms. In total participants who were selected from gyms were 240, including 162 were males and 78 were females. They were randomly selected from eight gyms (Fitness, Red gym, Oxygen gym, Daughter of Libya Center for Fitness and Beauty, Sultan gym, Omar gym, Saad gym, and Makhlouf gym) after obtaining permission from the center for sports management to distribute questionnaires to the athletes and coaches. Collecting participants' data and assessing their attitudes, knowledge and consuming supplements of protein were by using paper or electronic questionnaires.

2.2. Assessing of knowledge, Attitudes, and Protein Supplements Usage.

The present study used a self-administered, validated and pretested questionnaire to gather data on adult Libyans' knowledge, attitudes, and use supplements of protein (20). The questionnaire was classified into two sections:

the first part consisted of 29 questions connected to personal data, such as (age; gender; height, weight, education level, job, frequency of visits to the gym; protein utilization, comprising the quantity of protein eaten and required; the kind of protein; the timing and purpose of the protein consumption) participants' knowledge regarding the using supplements containing proteins, analysis before consuming protein; positive changes and side effects after consuming protein. Also, the information's source, those that influence protein supplement ingesting, and symptoms related to protein consumption were all covered in the questionnaire. In the second part, six statements regarding protein supplements were presented to respondents, who were requested to select their responses on a four-point Likert scale (strongly agree, agree, disagree, strongly disagree).

2.3 Statistical Analysis

Coded data were analyzed using Statistical Package for the Social Sciences (SPSS) version 22, and descriptive data were used to summarize the social demographic characteristics of gym users. Statistical analysis of knowledge and attitudes to protein supplement uses were conducted by using the chi-square test or Fisher`s test. The general satisfaction and the various features related to the educational level of participants and calculation of protein and knowledge and attitude regarding the usage of supplemental protein were examined by using Spearman correlation to indicate statistical significance. The level of significance was set at a value of ≤ 0.05.

2.4 Ethical Considerations

Permission to collect the primary data was obtained from the Department of Nutrition at the University of Benghazi. Research Ethics Committee approved the study at the Faculty of Public Health, University of Benghazi**.** Respect or the participants (autonomy) was kept. The purpose of the research and the expected duration for the participants to complete the interview were communicated. This study kept the confidentiality of the participants and their names were not written on any results.

3. Results

Table 1 summarizes the basic demographical characteristics of respondents. Out of the 240 participants, 68% were men and 32 % were females. 47% of the sample was 26- to 35-year-olds. Seventy one percent (71%) of participants were single and over 61% were holders of a university degree. Around 35% of participants were businessmen and 5% of them were teachers. Most participants (68 %) were with income less than 1000 dinar. The majority of respondents (89 %) had no illnesses. 53.3% of respondents did not do any blood tests before starting protein supplements while 40% of them did liver and kidney function tests before starting protein supplements as in Figure1.

The types, amount, and timing consumption of protein supplements linked to gender are displayed in Table 2, more than half (64.6%) of participants used both powder protein and protein-fortified food. Approximately 44.2% of the respondents consumed between a scoop or two of protein supplements daily. Of the most males 72% consumed 1- 2 scoops. Whereas, 28% of females consumed the same amounts. 61% of participants took protein supplements immediately after exercising and 41% of participants used whey protein.

Table 3 shows the participants' answers to the reasons for the consumption of protein and the positive change and adverse effects of taking a protein supplement by gender. Maintaining a good body shape was the main reason for consuming the supplements by 41%, 83% of them were males and 17% were females.

Table 1: Demographical Characteristics of the Study Sample (N=240)

Variable	Frequency	%
Gender		
Male	162	**68%**
Female	78	32%
Marital status		
Single	170	**71%**
Married	70	29%
Age category		
16- 25	86	36%
26-35	113	**47%**
36-55	41	17%
Educational level		
Primary	14	6%
Secondary	80	33%
University	146	**61%**
Occupation		
Businessman	84	**35%**
Employee	63	26%
Student	39	16%
Doctor	16	7%
Engineer	16	7%
Coach	9	4%
Teacher	13	5%
Income		
Less than 1000	163	**68%**
More than 1000	77	32%
Do you suffer from any diseases?		
Yes	27	11%
No	213	**89%**
If yes, then what is the disease?		
Diabetic	8	3.3%
Hypertension	3	1.2%
Insulin resistance	2	0.8%
Rheumatoid	1	0.4%
Other	13	5.4%

Table2: The types, amount, and timing consumption of protein supplements linked to gender

Variable	All	Male	Female
What type of supplement protein do you take?			
Powder	29.6%	70.4%	29.6%
Protein-fortified food	5.8%	43%	57%
Both of them	**64.6%**	**68%**	**32%**
Number of scoops/days			
fewer than one scoop	6.7%	37.5%	62.5%
Only 1 scoop	21.7%	36.5%	63.5%
Scoop1_2	**44.2%**	**72%**	**28%**
Greater 2 scoops	27.4%	92.4%	7.6%
Timing of consumption			
Early morning	13%	58%	42%
Before exercising	14%	56%	44%
Immediately after Exercising	**61%**	**45.6%**	**54.4%**
Any other time	12%	86%	14%
What type of supplement protein do you utilize?			
Whey protein	**41%**	**58%**	**42%**
Isolate protein	18%	64%	36%
Mass protein	36%	86%	14%
Other	5%	23%	77%

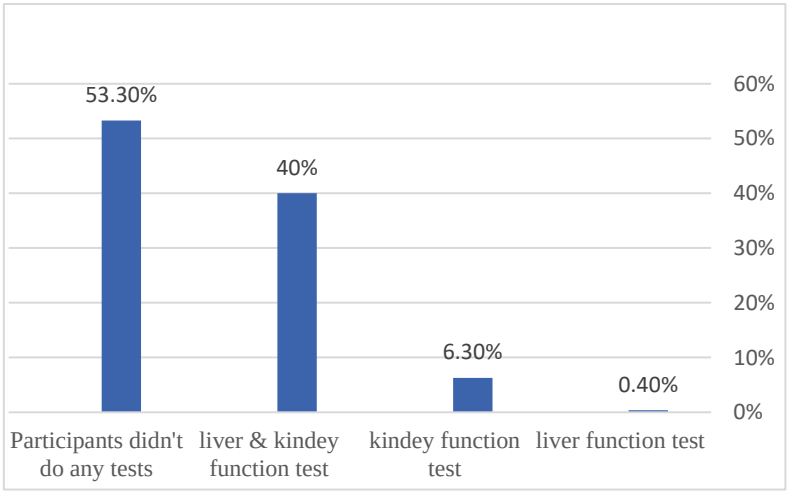

Figure 1: Laboratory tests done before participants started to take the supplement protein

Table 3: Reasons for consuming protein and the positive change and adverse effect of taking a protein supplement by gender (N (%).

Variables	All	Male	Female
Why do you consume a protein supplement?			
Maintain good body shape	**41%**	**83%**	**17%**
Gain muscle	35%	68%	32%
Weight loss	13%	29%	71%
Weight gain	11%	54%	46%
Who has recommended you to consume protein supplements?			
Coach	**47.5%**	**70%**	**30%**
Nutritionist	19.5%	72%	28%
social media	17.9%	58%	42%
Friends / relatives	5.8%	43%	57%
No one	9.1 %	77%	23%
Have you noticed any side effect after consuming these supplements?			
Yes	6.25%	67%	33%
No	**93.7%**	**68%**	**32%**
Have you noticed any positive changes after consuming these supplements?			
Yes	**92.5%**	**71%**	**30%**
No	7.5%	28%	72%

In table 4 displays that the majority of respondents agreed with the statement that stated that fitness centre attendees should take protein supplements, Consuming protein supplements reduce the build-up of undesirable body fat, most individuals my age do not take adequate protein in their diets, supplements of protein are preferable to diets rich in protein. for muscle building and supplements contain protein are energy source during workouts. However, participants

Table 4: knowledge and attitudes of respondents about supplements protein related to gender (N (%).

Variable	All	Male	Female
Should fitness centre attendees consume protein-supplements?			
strongly agree	15%	76%	24%
agree	**68%**	**77%**	**23%**
disagree	16%	23%	77%
strongly disagree	0.4%	0%	0.4%
Consuming protein supplements reduce the build-up of undesirable body fat			
strongly agree	16%	77%	23%
agree	**47%**	**73%**	**27%**
disagree	32%	54%	46%
strongly disagree	5%	75%	25%
Most individuals at my age do not take adequate protein in their diets			
strongly agree	19%	65%	35%
agree	**67%**	**68%**	**32%**
disagree	13%	65%	35%
strongly disagree	1.25%	1.25%	0%
Protein supplements are essential for building of muscle through weight lifting.?			
strongly agree	13%	68%	32%
agree	33%	81%	19%
disagree	**43%**	**56%**	**44%**
strongly disagree	12%	71%	29%
Protein supplements are preferable to diets high in protein for building of muscle			
strongly agree	25%	75%	25%
agree	**68%**	**66%**	**34%**
disagree	7%	56%	44%
strongly disagree	0.4%	0%	0.4%
Are protein supplements a good source of energy for exercises?			
strongly agree	26%	68%	32%
agree	**53%**	**67%**	**33%**
disagree	19%	65%	35%
strongly disagree	2.5%	2.5%	0%

could not agree on the statements that claimed that supplements are necessary for building of muscle through weight lifting.
Table 5 presents that half of participants visited gym three times a week. 63.6 % of them were men while 36% were women.

Table 5: Attendance of the participants relate to gender (N (%))

Variable	All	Male	Female
How often do you go to the gym?			
Daily	29%	70%	30%
3 times a week	**50.4%**	**63.6%**	**36.4%**
A few hours a week	5.4%	53.8%	46%
Other	15%	80.6%	19.4%

Table 6 represents the knowledge and attitude and protein daily protein of respondents connected to education level. There was a strong correlation between the statements that protein supplements are critical for muscle building through weight lifting and education level (p=*0.000). However, the rest of the items that showed knowledge and attitude were not related to education level. There was strong association between the statements that indicated the calculation of daily protein requirement and education level (p=*0.000).

4. Discussion

The main results of the current study show that 68 % of respondents who use protein supplements were males and 32 % were females which corroborates with the earlier studies that found males took more protein supplements than females (18,19,20). It could be explained by the fact that males were exercising more frequently than females as previously reported (19). In the current research, more than half of participants (60.8%) were holders of a university degree. These findings agree with a previous study reported that 67.9% of respondents had a history of tertiary education (21). Additionally, a previous study also highlighting that usage of supplements was higher in those having higher education (22). The finding of our study showed that the highest percentage of the participants was in the age group of 26- 35 years. This similar to findings published earlier (21,23). The results of the present study confirm that less than half of the participants did liver and kidney function tests before starting to protein supplements. These results are in line with earlier research that showed similar results (24,25).

According to the present findings, 41% of participants used whey protein and 58% of them were males, and 42% were females. These results are in line with earlier research which indicated that 54.5%, and 50 % of participants consumed whey protein respectively (9,18). Furthermore, a previous study has reported that gym visitors prefer whey protein supplements because they appear to be more successful in raising rates of muscle protein synthesis during exercise (11). The current results reveal that respondents used between a scoop or two of protein supplements daily and the most of them were males. This is in agreement with earlier study which showed similar result (1). Our result reports that the majority of gym attendees 1–3 times per week. These findings agreed with earlier study (26).

Additionally, the present results reveal that respondents were taking protein supplements immediately after exercising. These findings of the present research agreed with earlier studies carried out in Baghdad city and Saudi Arabia which found that participants taking protein after exercise by 45.5% and 45% respectively (1,9). The results of this study show that 41% of participants were taken protein for maintaining a good body shape. This is in agreement with previous study that showed same results (9,11 ,18). On the contrary, previous studies confirmed that the main typical cause cited by participants for taking supplements of protein were to enhance their food (27). The explanation of the difference between the results studies may be the majority of participants 83% were males and they appear to use protein for increasing strength, muscle

Table 6: knowledge and attitude and calculation of daily protein of participate related to educational level

Variable	All%	*P%	*S %	*U%	P-value
Should fitness centre attendees consume protein supplements	**(Question for attitude)**				
strongly agree	15	3	35	62	
agree	68	8	36	56	
disagree	16	0	21	79	
strongly disagree	0.4	0	0	0.4	0.121
Consuming protein-supplements reduces the build-up of undesirable body fat	**(Question for knowledge)**				
strongly agree	16	7.7	41	51.3	
agree	47	7	35	58	0.240
disagree	32	4	30	66	
strongly disagree	5	0	8	92	
Most individuals at my age do not take adequate protein in their diets	**(Question for knowledge)**				
strongly agree	19	2.2	34.8	63	
agree	67	5.6	32.5	61.9	0.188
disagree	13	8	34	58	
strongly disagree	1.25	33.3	66.7	0.0	
protein supplements are critical for building of muscle through weight lifting?	**(Question for knowledge)**				
strongly agree	13	0.0	58	42	
agree	33	13.9	49.4	36.7	0.000
disagree	43	2.9	20.6	76.5	*
strongly disagree	12	0	7	93	
Are foods high in protein better than protein supplements for building of muscle?	**(Question for knowledge)**				
strongly agree	25	5	30.5	64.5	
agree	68	6	37	57	0.541
disagree	7	6.3	12.5	81.2	
strongly disagree	0.4	0	0	100	
Protein supplements are source of energy for exercises?	**(Question for knowledge)**				
strongly agree	26	6.5	35.5	58	
agree	53	6	32	62	0.987
disagree	19	4.3	34.8	60.9	
strongly disagree	2.5	0	33.3	66.7	
Do you count how much protein you need each day	**(Question for knowledge)**				
Yes, I do	27.5	1.5	16.7	81.8	*0.00
No roughly	72.5	7.5	39.7	52.9	0

*Statistical differences *p*.value <0.05 by Chi. Square test
*P is for Primary * S is for Secondary * U is for University

mass and performance (28). As a result of the current investigation, coaches provided the respondents with the main information regarding supplements of protein. This in agreement with other previous research carried out in Saudi Arabia, demonstrated that the main people who advised users to consume supplements of protein were coaches (1). Nearly 30% of participants in Swiss study obtained their information on protein supplements from the coach or trainer (13). Moreover, male members from Riyadh gym got their information from non-health professionals (29). However, this is in contrast with earlier study showed that the majority (57%) of volunteers were consuming supplements based on a doctor's recommendation (5). The explanation for this might be because of the difference in collection data in Saudi study participants were not members of gyms from general public while in present study participates were gym users and they found coaches easier way to contact. The finding of the study shows that the majority of participants did not notice any side effects related to consume protein supplements. These results are in agreement with previous study (1). However, this in contrast with earlier studies carried out Saudi sport center users revealed that the majority of those who took powder of supplements protein experienced gastrointestinal problems, including indigestion, constipation diarrhea, stomach pain, nausea and decreased appetite (30). The explanation of the difference between the results studies was the types of protein use. In our study more than half of participants consumed protein-fortified food and powder. Current study finding shows good knowledge and attitudes about consuming protein supplements. The previous studies presented nearly the same percentage of awareness of volunteers (1,9).

According to the present study, there was a strong correlation between knowledge and level of education. This similar to previous results showed that most gym users were of similar educational level having university bachelor's degrees (11,19).

5. Conclusion

The present study revealed that over half of the participants who use protein supplements were males and they used more than one protein supplement. The most of gym attendees who used protein supplements one to three times were taken protein supplements immediately after exercising. Moreover, less than half of participants took protein to maintain a good body shape and less than half of participants used whey protein. It seems that coaches who encouraged participants to use protein supplements. Sport center visitors in this study showed good knowledge and attitudes about consuming protein supplements and there was a strong correlation between knowledge, and daily protein calculation of participants and level of education.

Study limitations

This study has some significant limitations; lack of cooperation of some private centers and allow taking information from gym users. Some gyms did not have members who take supplements protein.

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Conflicts of Interest

Authors declare no conflicts of interest.

References

1- Alhakbany MA, Alzamil HA, Alnazzawi E, Alhenaki G, Alzahrani R, Almughaiseeb A, Al-Hazzaa HM. Knowledge, attitudes, and use of protein supplements among saudi adults: gender differences. *Healthcare* 2022;10(2): 394

2- Bailey RL, Gahche JJ, Lentino CV, Dwyer JT, Engel JS, Thomas PR, Betz JM, Sempos CT, Picciano MF. Dietary supplement use in the United States, 2003–2006. *The Journal of nutrition.* 2011 Feb 1;141(2):261-6.

3- Kourkouta L, Iliadis C, Frantzana E, Monios A, Dimitriadou A, Papathanassiou IV. Health and dietary supplements. *Int J Eng Appl Sci.* 2016

Sep;3(9):2394-3661

4- Elsahoryi NA, Odeh MM, Jadayil SA, McGrattan AM, Hammad FJ, Al-Maseimi OD, Alzoubi KH. Prevalence of dietary supplement use and knowledge, attitudes, practice (KAP) and associated factors in student population: A cross-sectional study. *Heliyon*. 2023; 9(4).

5- Algaeed HA, AlJaber MI, Alwehaibi AI, AlJaber LI, Arafah AM, Aloyayri MA, Binsebayel OA, Alotaiq SA, Alfozan MA, Ahmed IB. General public knowledge and use of dietary supplements in Riyadh, Saudi Arabia. *Journal of family medicine and primary care*. 2019;8(10):3147.

6- Calfee R, Fadale P. Popular ergogenic drugs and supplements in young athletes. *Pediatrics*. 2006 Mar 1;117(3):e577-89.

7- Sobal J, Marquart LF. Vitamin/mineral supplement use among athletes: a review of the literature. International Journal of Sport *Nutrition and Exercise Metabolism.* 1994 Dec 1;4(4):320-34.

8- Molinero O, Márquez S. Use of nutritional supplements in sports: risks, knowledge, and behavioural-related factors. *Nutricion hospitalaria.* 2009;24(2):128-34.

9- Ghazi HF, Abdalqader M, Hasan Tn. Kn owledge and Attitude of Young Athletes in Baghdad City/Iraq Toward the Use of Sports Supplements. Malaysian *Journal of Public Health Medicine*. 2022; 22(3):153-9.

10- Saleh KK, Julien SG. Protein Supplement Perceptions, Use, and Associated Performance in Young Lebanese Resistance-Training Athletes. *Journal of Nutrition and Metabolism*. 2022 18;2022.

11- El Khoury D, Antoine-Jonville S. Intake of nutritional supplements among people exercising in gyms in Beirut city. *Journal of nutrition and metabolism.* 2012; 2012.

12- Goston JL, Correia MI. Intake of nutritional supplements among people exercising in gyms and influencing factors. *Nutrition*. 2010; 26(6):604-11.

13- Mettler, S.; Bosshard, J.V.; Häring, D.; Morgan, G. High prevalence of supplement intake with a concomitant low information quality among Swiss fitness center users. *Nutrients.* 2020; 12, 2595.

14- Sharif SI, Mohammed A, Mohammed I, Sharif RS. Evaluation of knowledge, attitude and use of dietary supplements among people exercising in the gym in Sharjah-United Arab Emirates. *Phys. Med. Rehabil. Res.* 2018;3(5):1-5.

15- Jovanov P, Đorđić V, Obradović B, Barak O, Pezo L, Marić A, Sakač M. Prevalence, knowledge and attitudes towards using sports supplements among young athletes. *Journal of the International Society of Sports Nutrition*. 2019 Dec;16:1-9.

16- Ahmadi F, Ebrahimi M, Kashani V. Sports nutritional knowledge, attitude, and practice of adolescent athletes in Tehran, Iran. *Asian Journal of Sports Medicine.* 2022 Dec 31;13(4).

17- Kablan NM, Mansor EA, Denna I, Alabeade A, Alsahly F, Almagbry H, Elfergani H. The Prevalence of Dietary Supplements Use at University of Benghazi Medical Campus. 202; (11): 65-71.

18- Bianco, A., Mammina, C., Paoli, A., Bellafiore, M., Battaglia, G., Caramazza, G., & Jemni, M. Protein supplementation in strength and conditioning adepts: knowledge, dietary behavior and practice in Palermo, Italy. *Journal of the International Society of Sports Nutrition*, 2011; 8(25); 1-6.

19- Jawadi AH, Addar AM, Alazzam AS, Alrabieah FO, Al Alsheikh AS, Amer RR, Aldrees AA, Al Turki MA, Osman AK, Badri M. Prevalence of dietary supplements use among gymnasium users. Journal of nutrition and metabolism. 2017 ; 5;2017.

20- Scofield DE, Unruh S. Dietary supplement use among adolescent athletes in central Nebraska and their sources of information. *The Journal of Strength & Conditioning Research.* 2006: 20(2):452-5.

21- Braun M, Venter I. Use of dietary supplements, and awareness and knowledge of the recommended fruit and vegetable intakes and consumption of health food store customers in the Cape Town city bowl. *South African Journal of Clinical Nutrition.* 2008 ;21(4):323-30.

22- Alowais MA, Selim MA. Knowledge, attitude, and practices regarding dietary supplements in Saudi Arabia. *Journal of family medicine and primary care*. 2019;8(2):365..

23- Ishihara J, Sobue T, Yamamoto S, Sasaki S, Tsugane S. Demographics, lifestyles, health characteristics, and dietary intake among dietary supplement users in Japan. *International Journal of Epidemiology.* 2003;32(4):546-53.

24- Schlickmann DS, Molz P, Brand C, Dos Santos C, da Silva TG, Rieger A, Benito PJ, Reuter CP, Renner JD, Franke SI. Liver and kidney function markers among gym users: the role of dietary supplement usage. *British Journal of Nutrition.* 2022;128(4):704-11.

25- Galati, PC, Carreira, NP, Galvão, SR, et al. Nutritional and biochemical profile of young practitioners of physical activity in the use of nutritional supplementation. Braz *J Sports Nutr*. 2018; 11(68):1050-1060.

26- Hartmann C, Siegrist M. Benefit beliefs about protein supplements: A comparative study of users and non-users. *Appetite*. 2016; 103:229-35.

27- Froiland K, Koszewski W, Hingst J, Kopecky L. Nutritional supplement use among college athletes and their sources of information. *International journal of sport nutrition and exercise metabolism.* 2004; 14(1):104-20.

28- Morton, R.W.; Murphy, K.T.; McKellar, S.R.; Schoenfeld, B.J.; Henselmans, M.; Helms, E. A systematic review, meta-analysis and meta-regression of the effect of protein supplementation on resistance training-induced gains in muscle mass and strength in healthy adults. Br. *J. Sports Med*. 2018, 52, 376–384.

29- Alshammari, S.A.; AlShowair, M.A.; AlRuhaim, A. Use of hormones and nutritional supplements among

Gyms' attendees in Riyadh. J Fam. Community Med. 2017, 24, 6–12.

30- Alhekail, O.; Almeshari, A.; Alabdulkarim, B.; Alkhalifa, M.; Almarek, N.; Alzuman, O.; Abdo, A. Prevalence and patterns of the use of protein supplements among gym users in Riyadh, Saudi Arabia. *Int. J. Pharm. Res.* Allied Sci. 2018: 7:80–86.