

Effects of Exercise with Green Tea, Lemon & Honey as Supplement on Body Composition & Physical Fitness (Exercises)

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ABSTRACT

Aim of the Study: The main objective of the study was to investigate the effect of Green tea, lemon and honey composition (Homoeopathic) on body weight.

Methodology: The cross sectional and experimental study examine the subjects who were selected through purposive sampling technique. The participants of the study consisted of those subjects having Body Mass Index (BMI) more than 20 and less than 26 of Student, University of the Punjab, Lahore Pakistan. The subjects of the study were divided into two group as experimental and Control group and each group comprised of 15 respondents in which 8 males and 7 females respectively. Age (year), Weight (kg) and Height (cm) demographic variables measurements were also taken. 10 Normal subjects were also taken for further investigation. The quantitative research implemented with exercise for 8 weeks training protocols and results observed.

Findings: The study utilized principal of progression, Specificity and Overloading utilized in this research. The reliability checked through Cronbach's Alpha whose value was 0.81. The validity checked through a pilot study. After application of prescribed exercise protocols with (Composition) pre and post test data were collected and paired sample t-test were executed.

Conclusion: The data were analyzed by researcher through Statistical Package for Social Science (SPSS-26) and concluded that green tea has an optimistic result in the weight management, lemon and honey as natural a supplement. The skinfold measurement of triceps, bicep, and suprailiac values were calculated in mm Mean \pm S.D = 0.7 ± 2.1 . Similarly, for girl's triceps and bicep values in mm Mean \pm S.D = 0.88 ± 0.8 . The Push-up test (reps) value and explosive power test values (cm) were also calculated for all the subjects it shows significant improvement in both male and female push up and explosive power test along with weight loss as well.

Keywords: Weight Management, Demographic, Body Mass Index, Statistical Package for Social Science (SPSS-26).

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Introduction

Both overweight and obesity have become a significant public health concern all over the world (Gill et al., 2023). The current issues in sports having weight reduction and health implications of mass cut down behaviors, the vital thing is that to explore the important and effective factors weight loss that prophesy the occurrence of it. The latest research utilized the weight examine factor which affect the behavioral intentions of balance weight, assess of predictive power of health belief model (HBM) for body mass index (BMI). It was a cross sectional study in which 40 students were selected as participants by using purposive sampling technique. Data was collected by a structured questionnaire based on HBM. Structural equation modeling (SEM) was conducted to identify the relationship between HBM constructs and behavioral intention of weight management. These findings suggest that health education programs based on the HBM needs to be integrated in preventive health programs and health interventions strategies to ensure adherence and well-being of the participants (Saghafi-Asl et al., 2020; Maqsood et al., 2024). The elite athletes mentioned that weight loss is more effective through, core stability, regular exercise, stretching with right diet combination modestly effective for weight loss and results in variable weight loss responses (Gill et al., 2023; Maqsood et al., 2024; Gill et al., 2024). It is possible that some of the chances in weight loss may be explained by the time of the day that exercise is performed. There are numerous studies which concluded that exercises can be performed at any time of the 24 hours day with herbal medicine cines as a result of reducing fat and showed significant effect on body posture (Bucci, 2000; Amin & Nagi, 2009). The natural supplements not only reduce the body fat percentage but also help in improving body posture control blood pressure, stable diabetic patients reduction of lean mass without any risk (Gill et al., 2022; Maqsood et al., 2023) The literature have an evidence that extra weight and fat mass loss by exercise that are performed at early morning time, while rest of the studies had concluded that dusk exercise is superior for weight reduction activities. If it will be more effective exercises timing as might be change routine activities and attitude as it concerned with weight supervision, for instance sedentary life style, energy intake and sleep. Different researcher predicted and concluded their results with exercise that performing sessions at any time of the day is beneficial for health and weight management among all type of population (Blankenship et al., 2021; Gill et al., 2024). Green tea is the most important beverage which is consumed on large scale in the world. Different type of tea product is used in different regions of the world like green tea, black and Oolong tea (Begic et al., 2024). But the most important usage percentage is green tea because of its composition as it contains polyphenols which have been investigated in few recent years with great benefits. Total tea leaves production is almost 2.5 million tons from which 2.5% is green tea (Begic et al., 2024). The Green tea extract (GTE) is the put forth anti-obesity and anti-inflammatory effects. The research was conducted to check the effect of green tea with exercise both as anti-obesity and anti-inflammatory effects among overweight population (Uduwana et al., 2023). Weight management also helps in rehabilitation state, athletes become over weight and resulted in obese condition (Abbas et al., 2021) not working on physical fitness sessions. The research evidenced that rehabilitation process should started within 24 hours after injury and as soon as relief from pain (Gill et al., 2021;), infect hydrotherapy may played a major role in get rid of this position as well (Gill et al., 2019; Nazar et al., 2021). The balance diet & proper implementation of rehabilitation protocol get out from obese situation (Gill et al., 2022). A study conducted by Ghasemi et al. (2020) concluded that overweight women were observed and given plan for exercises with herbal medicine showed remarkable results. The results showed that body weight, BMI, waist to hip ratio and body fat percentage were decreased in control group. It is also enhances the exercise volume capacity, body composition by producing further changes in weight, BMI, Waist to Hip (W-to-H) ratio and fat deposition in the body. The combination of regular exreicse and combination things brought great production in anti-inflammatory (increases in adiponectin) and metabolic (decreases in hs-CRP) markers as it compares with alone exercises execution protocols (Bagheri et al., 2020). The phytochemicals special effects, as combination catechins, on workout measures have become a applicable topic as ongoing epidemiological facts suggests their potential position in reduction of weight. Though catechins played a major role in alter the fat and energy anabolism and catabolism, scientific special

effects of combination consumption still remain divisive (Blankenship et al., 2021). The vital thing is that how catechins and exercise controls the reduction of fat without any injury or risk, exercise and combination association showed remarkable improvement in groups, while performing the exercise in group and alone protocols. The current scientific literature showed significant results regarding the interplay between catechins and group exercise which have great importance in overweight and obese community. Moreover, it was observed that green tea combination with exercise training have a capability to reduce the changes in body composition parameters (Amin & Nagy, 2009; Blankenship et al., 2021; Braschi et al., 2023).

Benefits of Green Tea

General benefits

It prevents from cancer of lungs, -kidney, mouth, esophagus, stomach, intestine, glands pancreas and epidemiological type. Green tea is also very helpful in mouth wash. It is used for hygiene maintenance with a goal on the prevalence of periodontal disease due to its antibacterial and antioxidant features.

Effect on liver, Obesity & Breast Cancer

Due to its silent features and its property green tea is used to prevent liver disease such as hepato-cellular carcinoma HCC, fatty liver and liver cirrhosis. It also prevents liver cancer, hepatitis and other chronic diseases. It is also beneficial against type 2 diabetes and obesity or coronary disease. Green tea is very important in weight management and obesity because of EGCG which is anti-obesity and antibiotics effects (Abbas et al., 2021). It is noticed it is very important and having great attention in management of obesity. Breast cancer is very common among females. It is noted that green tea is beneficial and having positive effects against breast cancer because of anti-cancer effects.

Effect on Blood Pressure & Skin

It is investigated that green tea has a large positive effect in management of BP. Due to antioxidant and vasodilation property green tea manage it. It is also beneficial against GT, CVD stroke, MI and CAD. It is also helpful to manage hypertension that's why green tea is very important. Green tea having polyphenols which are photoprotective in nature and used as pharmacological agent against solar UVB and skin disorders like photoaging, melanoma and non-melanoma skin cancer.

Green tea as Antioxidant

Green tea is used as antioxidant which are helpful against reactive oxygen species. Such as single oxygen superoxide, peroxy radicals hydroxyl radicals and peroxynitrite. Green tea is helpful in maintain imbalance of these substance leads to cellular issues and damage (Prasanth et al., 2019).

Statement of the problem

- ✓ Weight management through green tea, lemon & honey along with exercise is effective for fat reduction (weight reduction) and fitness improvement in athletes.

Objective of the Problem

- ✓ To examine the special effects of combination of (Green Tea, lemon and honey with exercise) achieve cut down the level of body fat composition and fitness.
- ✓ To achieve an athletic body after implementation 8 weeks combination (Green Tea, lemon and honey with exercise).
- ✓ To educate the athletes about effectiveness of natural supplements and exercise.

Significant of the Study

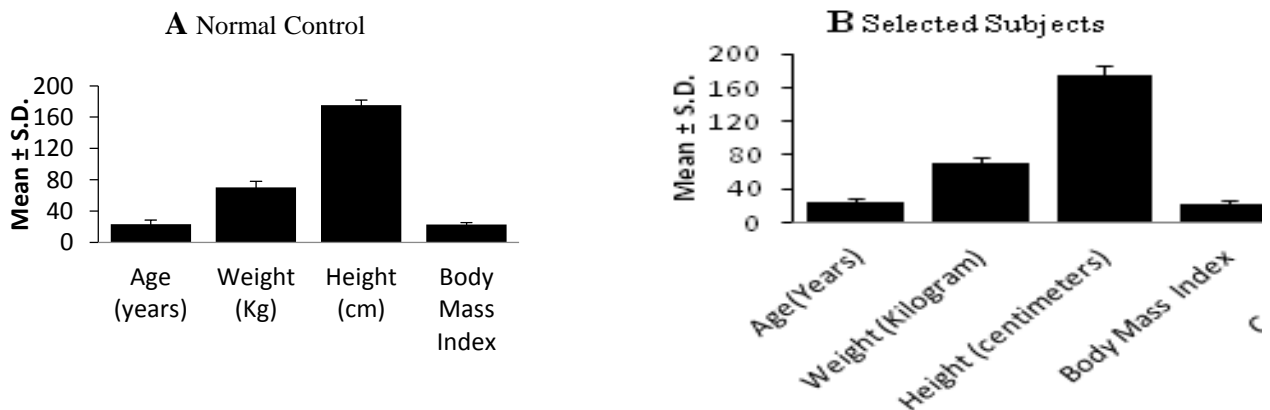
Green Tea with lemon and honey composition will be helpful in cut down the fat percentage in the body. It is not only helpful in the reduction of the body fat along with lean mass but also helpful in the achievement of the athletic body type best posture. The major benefit of this research is to not only get the posture as per required according to the sports but also cut down the risk of swear diseases like cancer for long term. Weight can be managed with this composition medicine and surgery but its side effects have serious consequences. The effective and efferent strategy is, one should successful achieve its goal in sports without any hindrance.

Research Question

- ✓ Do the combinations of Green tea, lemon and Honey along with physical exercises help to get decrease in fat percentage and get good posture?

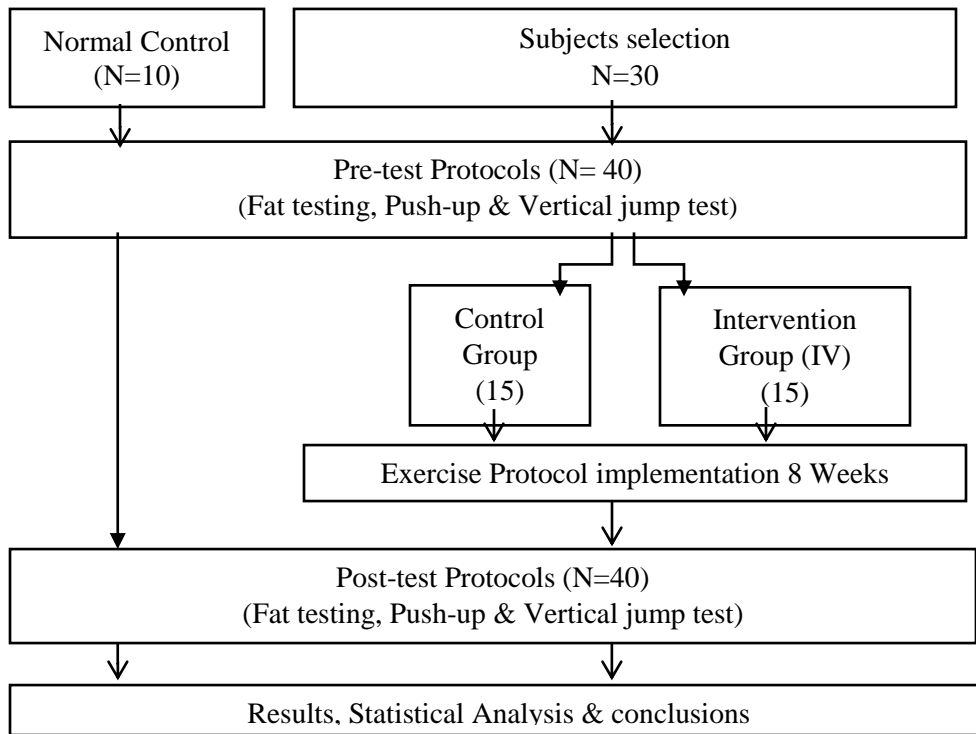
Methodology

This is an experimental and cross sectional study in which quantitative approach of research has been utilized. 40 participants having overweight were selected for this purposive sampling technique. These participants were split into Control Group (n=15) & interventional Group (n=15). Normal subjects (N=10) were also selected for further comparison. The experimental group was undergone for 8 week endurance training (aerobics, circuit training and walk or jogging). The subjects were selected through purposive sampling technique. The subjects were selected through criteria from the different departments of Punjab University. The Body Mass Index value of the participants had above than 20 age of the participant had a range of 19-25 years. The participants having no health issue and chronic injury, no medications utilized by the subjects for the last 6 months and no bone fracture for the last 6 months as per basic criteria of the subject selection in this particular research. The pre-test values had been taken before the implementation of the composition plan. The treatment was given to the subjects for 8 weeks and again took the post test values. The paired sample t-test implemented after completed the 8 weeks composition plan and exercise plan. The activities in this experimental research can also been seen in the following flow chart 1 below. The subjects were clearly informed about the aim and objective of the study and consent has been taken from every participant of the research. 40 subjects were participated in this research. The demographic variables were also taken of subjects (Age,Weight & Height), to get initial data of the participants. 40 male and female subjects were selected and 10 subjects (Normal Control, A) selected from different departments of Punjab University (PU) have Gymnasium and ground facilities. All are combined in graphic form which further divided into Normal, Control and intervention groups (N=40, subjects CG=15 and EG= 15) along with their Age, Weight, Height & Body Mass Index respectively.



Demographic variables Normal Control (N=10) & Selected Subjects (N=30)

Flow Chat Of Weight Management (WM)



Flow chart 1 shows the activities of the whole experimental research procedure

Shows Mean \pm S.D. of demographic variable i.e. Age (years, 22 ± 2.4), Weight (kilogram, 67.3 ± 5.4), Height (centimeters, 168.2 ± 5.1), Body mass index (23.7 ± 2.8) of Normal Control (NC=10) subjects are shown in Figure 1 A while Mean \pm S.D. of demographic variables of the selected subjects (N=30) including Age (years, 21.3 ± 2.2), Weight (kilograms, 71.6 ± 5.6), Height (centimeters, 166 ± 5.6), body mass index (25.85 ± 3.8) respectively as shown in Figure 1 B.

A normal control group (NC =10) also taken for further comparison. The eight weeks training plan was executed, showed comprehensive of composition & training (Green tea, lemon and honey) inn Table no 1 as per appropriate plan with collaboration of principle of specificity, progression and overloading.

Table 2: Showed the 8 weeks training and combination plan for the participants:-

Training program

Week\Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 1	Training + Combination	Off Day	Training + Combination	Off Day	Training + Combination	Off Day	
Week 2	Off Day	Training + Combination	Off Day	Off Day	Training + Combination	Off Day	
Week 3	Training + Combination	Off Day	Training + Combination	Off Day	Training + Combination	Off Day	O
Week 4	Off Day	Training + Combination	-----	Training + Combination	-----	Training Day	F
Week 5	Training + Combination	Off Day	Off Day	Off Day	Training + Combination	Off Day	D
Week 6	Off Day	Off Day	Training Day	Off Day	Training Day	Off Day	A
Week 7	Training + Combination	Off Day	Training Day	Off Day	Training Day	Off Day	Y

7						
Week						
8	Off Day	Off Day	Training Day	Off Day	Training Day	Off Day

The table 2 showed the detailed plan of 8 weeks exercise of the selected participants. The combination and exercise plan along with each week activities are shown in the above table.

Green Tea, Lemon & Honey (Combination)

The green tea is the combination of green tea leaves, water, honey, and lemon. The approximately calories in single cup serving was 7.6 calories. A single cup of tea has following ingredients and their amount in grams and weight as well.

Table 3: Showed the different ingredients utilized in the Combination (Green tea, Lemon and Honey) of 1 cup of tea.

Sr. No	Ingredients	Quantity/ calories
1	Leaves of Green tea	2 grams
2	Water	240 ml per cup
3	Caffeine	22-40 mg
4	Sugar	2 grams
5	Honey	8 oz
6	Lemon	1 to 2 grams
Total	Total calories per cup	7.6 calories per cup

Ethical approval of the study

Before conducting this research study consent was taken from all the participants in addition the research gained ethical approval from the department of sports Sciences and physical education Punjab University Lahore Pakistan.

Data Analysis

The pre and post test data was processed through SPSS version 26 (Statistical Package of Social Science). Paired sample t-test is utilized in this research for comparison and the value of pre and post-test of applied research. The completed results showed in Table 4 respectively.

Data Analysis

Table 4: Showing pre and post results of Normal Control, Control Group, and Intervention Group the selected participants.

Groups	Subjects	Pre & Post Testing	Fat testing	Push up	Explosive power	Diff t-value % values p-value				
						Fat	P-up	Explo		
Normal Control	Combine	Pre-Test	0.81 ±2.1	25 ± 2.3	22 ±2.3	-----				
		Post-Test	-----	-----	-----	-----				
Control Group	Combine	Pre-Test	0.79 ±1.9	24 ± 2.1	23 ±2.2	-----				18.03
		Post-Test	-----	-----	-----	-----				NS
Interven Group	Male	Pre-Test	0.7 ± 2.1	26 ± 2.2	22 ± 1.9	0.03	4	3		
		Post-Test	0.67 ±0.9	30 ± 2.3	25 ± 2.5	4.3	15.4	12	12.02	
	Female	Pre-Test	0.88 ±0.8	17 ± 3.2	12 ± 3.1	0.06	2	4	***	
		Post-Test	0.82 ±1.9	19± 3.2	16 ± 2.7	6.8	11.8	25	0.000	

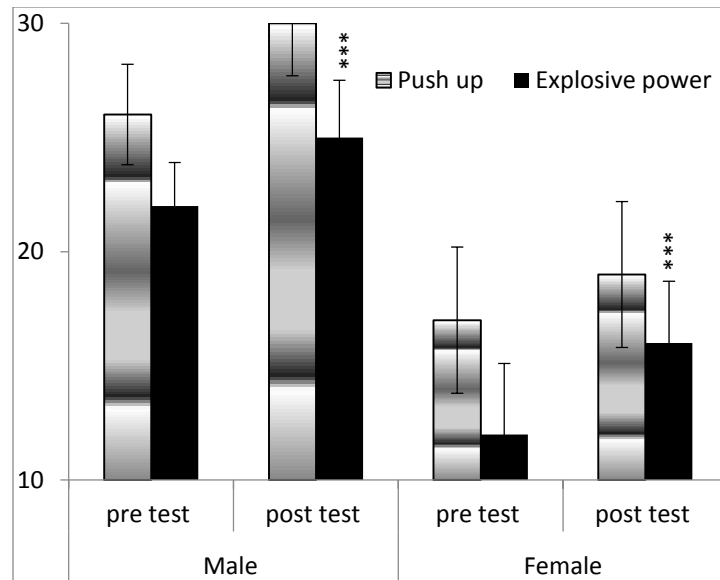


Figure 2: Showed the graphical representation of the pre and post data of the male and female push-up and explosive power test results.

The table 4 and figure 2 showed a comprehensive result of male and female subjects as they perform with help of combination and exercise plan for 2 months. The study included 10 normal control group subjects. The group performed their normal activities and their pre and post-test data were taken for further analysis. The control group subjects were also taken for further comparison. The participants of this group did not perform or take any intervention ingredients and exercises.

Discussion

The research had a clear point of view that exercise and different medicated values reduce the fat percentage in the body and also the improvement of body posture and performance. The results have been overlap with the result of Lin et al. (2020), Maqsood et al. (2023) and Gill et al. (2024), As our results are also indicated and observed that exercises on regular basis and combination (Green Tea, honey & lemon) showed remarkable results that will not only helpful for the ordinary people but also helpful for the novice and elite athletes as well. Furthermore, the supplements will not only enhances the performance but it also help in reduction, decrease and tone the body posture, the results was overlapping with Gill et al. (2022) as natural supplements remarkably help to reduce the fat percentage with less risk. Similarly, the daily intake of green tea, lemon and honey will help to reduce fat in the bosy along with exercise on common basis. The results are also matched with the Bucci (2000) and Amin et al. (2009), as the combination of exercise and green tea resulted in the reduction of the fat percentage in the body as taken from different places.

Conclusion

The post-test skinfold measurement showed a reduction in values and difference in improvement showed by push up and explosive power jump test value showed significant improvement after implementation of 8 weeks' along with natural supplement (green tea, lemon & honey) along with exercise respectively. The exercise and combination not only help in reduction of the health but also help in correct and stability of the posture. on the basis of data analysis, the researcher concluded that significance difference in the pre and post intervention of Experimental Group in the management of body weight. The researcher further concluded that exercise on daily basis and combination factors played a vital role in the management of weight and Body Mass Index as results shows major difference in pre and posts of both Control and Experimental group.

Recommendation

On the basis of data Analysis, Findings and conclusion the researcher recommended that exercise for 8 weeks and combination (Green Tea, honey & lemon) have a optimistic effect in the management of body posture, Body Mass Index, reduction of fat and maintain body posture. It will help in body building, Taekwondo (Karatey), weight training, power lifting and even every sport, for their weight management and reduction of fat percentage as well. This research will played a significant role in the sports weight management as we are lacking of such kind of research in sports era. Similarly, people might aware about their need and importance of these nature facts not only in health improvement but also enhancing the elite sports performance with no risk.

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Conflict of Interest

Authors have no conflict of interest.


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References

- Abbas, K., Gill, S. A., Sherwani, R. A. K., Qazi, T., Feroz, N., Adil, R., and Shahid, H., (2021). Prevalence of Obesity and Trends of Body Mass Index in Azad Jammu and Kashmir, *Journal of Pharmaceutical Research International*, 33(15), 69-82.
- Alfaifi, F. F., Alghamdi, A. M., Al-Omarani, B., Dawaji, E. H., Aljabry, H., & Al-Gayyar, M. M. (2020). Comprehensive Study of Scientific Evidence and Potential Risk of Herbal Medicine Use for Body Weight Reduction in North West Saudi Arabia. *Cureus*, 12(10).
- Amin, K. A., & Nagy, M. A. (2009). Effect of Carnitine and herbal mixture extract on obesity induced by high fat diet in rats. *Diabetology & metabolic syndrome*, 1, 1-14.
- Bagheri, R., Rashidlamir, A., Ashtary- Larky, D., Wong, A., Alipour, M., Motevalli, M. S., & Zouhal, H. (2020). Does green tea extract enhance the anti-inflammatory effects of exercise on fat loss?. *British journal of clinical pharmacology*, 86(4), 753-762.
- Begic, M., Huremovic, J., Selovic, A., & Karadza, A. (2024). The effect of ascorbic acid and lemon juice on the extraction of metals from green tea, health risk assessment. *Toxin Reviews*, 43(1),118-126.
- Blankenship, J. M., Rosenberg, R. C., Rynders, C. A., Melanson, E. L., Catenacci, V. A., & Creasy, S. A. (2021). Examining the role of exercise timing in weight management: a review. *International journal of sports medicine*, 42(11), 967-978.

- Braschi, A., Lo Presti, R., Abrignani, M. G., Abrignani, V., & Traina, M. (2023). Effects of green tea catechins and exercise training on body composition parameters. *International Journal of Food Sciences and Nutrition*, 74(1), 3-21.
- Bucci, L. R. (2000). Selected herbals and human exercise performance. *The American journal of clinical nutrition*, 72(2), 624S-636S.
- Ghasemi, E., Afzalpour, M. E., & Nayebifar, S. (2020). Combined high-intensity interval training and green tea supplementation enhance metabolic and antioxidant status in response to acute exercise in overweight women. *The Journal of Physiological Sciences*, 70, 1-9.
- Gill, M. S. A., Arsalan, M., and Umer, M., (2024). The Effect of Core Stability Exercises on Dynamic Balance on Novice Cricket Players (Male). *Human Nature Journal of Social Sciences*, 5(1), 275-285.
- Gill, S. A., Ayub F., and Qazi A. N. (2023). Rehabilitation of Rotator Cuff Acute & Chronic injury in Throwing Sports athletes (Cricket & Baseball) through Theraband & Hydrotherapy Exercises plus Treatment & Diagnosis Evaluation. *Human Nature Journal of Social Sciences* 4(1), 74-89.
- Gill, S. A., Akhtar, T., Islam, M., Khan Sherwani, R. A., Shahid, H., Yasin, S., and Waseem, M. T. (2022). Rehabilitation of Acute and Chronic Ankle Sprain for Male Cricketers through Mixedbag (Hydrotherapy and Land-Based) Exercises. *Journal of Bioresource Management*, 9(4), 123-133.
- Gill, S. A., Akhtar, T., Nazeer, T., and Shahid, H. (2019). Rehabilitation of Acute and Chronic Ankle Sprain of Male Cricketers Through Aqua Exercise. *Journal of the Research Society of Pakistan* 56(2), 387-400.
- Gill, S. A., Akhtar, T., Rafique, T. M., Naseer, A., Javed, S., and Shahid, H. (2021). Rehabilitation of Acute and Chronic Ankle Sprain of Male Cricketers Through Headway (Isometric, Isotonic and Proprioception). *Journal of Pharmaceutical Research International*, 33(39B), 250-264.
- Gill, S. A., Bilal, M., and Akhtar, M. S. (2023). Effects of Covid-19 (OBESITY): Result of Imbalance Nutrition and Physical Inactivity during Covid-19 (Athletes and Non-Athletes). *Human Nature Journal of Social Sciences*, 4(2), 245-253.
- Gill, S. A., Zahid, O., Abdullah, U., Shaheen, M., Naseer, A., Butt, Z. I., and Arslan, M. 2022 Prevalence, Information & Attitude towards Using Supplements among University Athletes. *Journal of Pharmaceutical Research International*, 34(49B), 7-17.
- Lin, Y., Shi, D., Su, B., Wei, J., Găman, M. A., Sedanur Macit, M., & Guimaraes, N. S. (2020). The effect of green tea supplementation on obesity: A systematic review and dose–response meta- analysis of randomized controlled trials. *Phytotherapy research*, 34(10), 2459-2470.
- Maqsood, M., Gill, M. S. A., Nabi, I., Umer, M., Imran, M., Adil, R., and Shahid, H. (2024). Influence of diet and exercise adherence in diabetic cases and its impact on HbA1c. *Wearable Technology*, 4(1), 1-7.
- Nazar, N., Naseer, A., Javed, S., Gill, S. A., Sharif, A.R.M., Safdar, N., Sher, A., and Ashar, A. (2021). Physical Characteristics of Female Student Players of Badminton Studying in Pakistani Universities Multicultural Education, 12(7), 586-591.
- Prasanth, M. I., Sivamaruthi, B. S., Chaiyasut, C., & Tencomnao, T. (2019). A review of the role of green tea (*Camellia sinensis*) in antiphotaging, stress resistance, neuroprotection, and autophagy. *Nutrients*, 11(2), 474.
- Saghafi-Asl, M., Aliasgharzadeh, S., & Asghari-Jafarabadi, M. (2020). Factors influencing weight management behavior among college students: An application of the Health Belief Model. *PLoS one*, 15(2), e0228058.

- Tallet, S., Gill, S. A., and Arshad, Zain., (2018). Comparative Study of Male and Female Athletes about Effect of Stretching Exercises on Flexibility, *Pakistan Social Science Review*, 2(2), 312-319.
- Tanyıldız, A. O., Çulhacı, E., & Yalçın, M. Y. (2021). Production of cold green tea with natural additives. *International Journal of Food Engineering Research*, 7(2), 55-68.
- Uduwana, S., Abeynayake, N., & Wickramasinghe, I. (2023). Synergistic, antagonistic, and additive effects on the resultant antioxidant activity in infusions of green tea with bee honey and Citrus limonum extract as additives. *Journal of Agriculture and Food Research*, 12, 100571.