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ORIGINAL

GENDER-SPECIFIC RESPONSES TO STRENGTH AND CONDITIONING PROGRAMS IN YOUNG ATHLETES

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ABSTRACT

Research aims to determine the strength and conditioning programs related to gender-specific responses. The research study was conducted between young athletes. According to gender language, gender-specific language refers to either only males or only females. Gender-specific perspectives identify and give feedback on the variety of specific conditions and susceptibilities of ladies and girls. These perspectives play a significant role in converting inequality between men and women towards equality. Anything that is gender specific is arranged for those belonging to a specific gender. And some particular things are suitable for people of a specific gender. The research used SPSS software to measure and describe results, including strength and conditioning programs and gender-specific responses. However, certain limitations can be seen to avoid gender-specific approaches. All the approaches inclined towards gender-specific clothes are going in such a way that they could be faster and smoother. Certain nouns are considered gender specific and can be utilized to represent animals or people of a specific gender, such as man, woman, boy, or girl. Overall, the result found a significant impact of gender-specific responses on strength and conditioning programs in young athletes. By applying gender-specific terms, it is crucial to know the gender to which individuals belong and then use some suitable term to elaborate them.

KEYWORDS: Gender Specific Responses (GSR), Strength (SS), Conditioning Programs (CP), Young Athletes (YA)

1. INTRODUCTION

The study of different athletic responses to the different programs of training and conditioning, depending upon the gender specifications, is

necessary as it leads to the optimization of training sessions depending on the needs, and performance can be enhanced. The difference between male and female athletes arises from their changes in physiological composition and developmental changes. There are different features and properties of the human body that depend upon gender specification and help display maximum performance (Lisee et al., 2020). For example, agility is the timely change in the course of action while playing on the field. It is an important quality that helps distinguish athletes from each other and improves their overall performance. It is enhanced by the constant conditioning and strength-gaining programs among different athletes, and changes in agility lead to changes in performance (Zwierko et al., 2022). In a recent study, it has been made clear that women athletes are more agile as compared to men athletes who might look all mighty and bulky in appearance. Therefore, tailor-made training programs are needed to overcome the deficiencies of the athletes depending upon their genders. Different sports disciplines show different performances of men and women, claiming that some sports are better performed by men than are performed by women. For instance, basketball has a high demand for anaerobic actions and high-intensity endurance capacities. Both aerobic and anaerobic capacities are necessary for completing the game in time and continuously deriving energy from glycolysis in the body (Mancha-Triguero, García-Rubio, Gamonales, & Ibáñez, 2021). In response to these requirements, men and women show different changes in their actions. The studies reveal that the men have high muscular composition and build and are therefore capable of more anaerobic capacity while playing. Therefore, they show better results on the playing field while dealing with basketball (Celada et al., 2021; Fang & Jiang, 2024).

Similarly, in the strength and conditioning programs, there are different responses to muscle fatigue depending upon the genders of young athletes. According to research, the ability of women to efficiently sustain the isometric action of muscles makes them less able to have muscle fatigue in some games. It tells that they are more resilient and helps them stick through the strength-gaining programs. Moreover, female young athletes cross the make athletes in forearm flexion by 50 to 70% because of their physiological composition and muscles. In sports, exercises that require more muscle strength are better performed by male athletes as they have more type-II muscle fibres linked to providing strength and, therefore, help male athletes show more power and strength (Shuman & Appleby, 2016). Developmental stages that occur during puberty also are a major cause of changes in the performance of male and female athletes. With puberty onset of puberty males tend to gain more muscle mass. In contrast, females can have major hormonal issues, which can lead to a lower gain in muscle strength that ultimately hinders them from performing well in strength-requiring activities. Female athletes, however, are better performers in balance-related exercises as they are more efficient in

maintaining balance because of their body structure than bulky and muscular male bodies (Yanci, Cámara, Vizcay, & Young, 2016). Similarly, while playing badminton, younger athletes show distinct changes in their responses. According to a study, young male and female athletes were observed during their training sessions, and their rally duration, rest time, and other factors were studied. According to the results, male athletes showed more strokes per rally and maintained longer rallies as compared to female players but at the same time, they rested more between rallies in contrast to the female badminton athletes (Fernandez-Fernandez, de la Aleja Tellez, Moya-Ramon, Cabello-Manrique, & Mendez-Villanueva, 2013). Due to these changes, different genders show distinct training adaptations as well. Male athletes show a better increase and gain in strength training because of their already strong baseline of muscle fibres, whereas females show less gain in that course because of their naturally stronger muscle fibre composition of the body (Suárez-Rodríguez & del Valle, 2019).

There are many strength and conditioning exercises where female also shows dominance because of their natural body composition. For example, in flexibility and mobility, female athletes show better performance because of more free joint movements and can, therefore, depict the demanded performance in dancing gymnastics and yoga sessions (Mueller, Mueller, Stoll, Baur, & Mayer, 2014). Furthermore, female athletes are more capable of having endurance capacity as compared to similar age-grouped male athletes. In female athletes, there is an increased proportion of muscles that twitch slowly, and due to this, these muscles are less likely to fatigue. This capability helps them maintain more endurance during strength and conditioning sessions compared to their fellow male athletes (Dopsaj, Martinovic, Dopsaj, Stevuljevic, & Bogavac-Stanojevic, 2011). The body structure of female athletes allows them to have more core strength than male athletes because of their naturally distinct pelvic structure design and, hence, the less heightened centre of gravity. All of these characteristics make female athletes capable of exhibiting enhanced core strength, and they can even increase it in many ways by using different strength-gaining sessions like performing planks and bridges, etc. Other than that, many factors like hormones also mark differences between female and male athletes. For example, in a study, athletes of both genders were studied during a volleyball match, and it was determined that playing volleyball can help differentiate the rise in hormones in both genders. In females, the growth hormones and cortisol showed more rise during the volleyball session, whereas the male athletes were found to have more rise in testosterone as compared to other hormones, thereby showing a change in physiological growth in both genders (Eliakim et al., 2009). The research study determined that gender-specific responses related to the strength and conditioning programs. The research paper is divided into five specific chapters. The first portion represents the introduction, and the second section describes

the literature review. The third section represents that methodology, and the fourth section presents the result and its descriptions. The last portion summarized overall research and presented some recommendations about gender-specific responses related to strength and conditioning.

2. Literature Review:

Various programs have been introduced to highlight the strength of young athletes according to their gender. Most of the training programs are the same for male and female athletes irrespective of their gender, but some responses are dependent upon gender(Kushner et al., 2015). The main objective of this review is to overview studies related to gender-specific responses to strength and conditioning programs in young athletes. There are quite a few differences between males and females regarding genders in terms of physiological adaptions, hormonal changes, metabolic changes, type and intensity of injury, behavioural changes, psychological changes, and others(Onambele-Pearson & Pearson, 2012). These strength and conditioning programs aim to train both genders according to their ability and keep the differences between them in view. Muscle strength is one of the important factors for an athlete to perform well and prevent injury. Such muscle strength can only be acquired with the help of proper training(McMahon, Morse, Winwood, Burden, & Onambélé, 2018). When resistance training is provided to both males and females to increase muscle strength, recent studies have observed and explained that men gain muscle strength and power more easily than female athletes(Dean, Nishihara, Romer, Murphy, & Mannix, 1998). By keeping this aspect in view, various training sessions are provided to male and female athletes. In contrast to resistance training, bodyweight training and nutrition can be proven effective for increasing muscle strength in female athletes(Quatman, Ford, Myer, Paterno, & Hewett, 2008).

There are some training programs for athletes in which body fat loss is necessary to perform well. It has been seen that male athletes can easily lose body fat as compared to female athletes. This aspect describes that the female body needs different training and nutrition to lose fat(Cai et al., 2019). It explains the reason for the emerging importance of gender-based training programs. For example, suppose there is a need for muscle strength in female athletes. In that case, there is suitable training of compound heavy lifts in which a group of muscles are engaged together to increase the strength and power of muscles in a female athlete(Smith, Holmes, & McAllister, 2015). Examples of compound heavy lifts are squw6s, deadlifts, and others. The other best training for increasing muscle strength in female athletes is explosive lifts such as pulls and jumps, which increase the body's energy and thus contribute to muscle strength and endurance (Mueller et al., 2014). In contrast to female training programs, the training programs are quite different for male athletes.

For example, high-intensity interval training is considered more suitable for male athletes, abbreviated as HIIT(Scanlan, Dascombe, Kidcaff, Peucker, & Dalbo, 2015). This training demands high energy and endurance of the body. This training improves male athletes' cardiovascular function, circulatory system, and muscle strength and power. These training programs are difficult for female athletes(Fang & Jiang, 2024). The other suitable training for male athletes is powerlifting, in which weight is lifted to increase muscle strength. This training requires much endurance and power of the body and thus can be performed well by male athletes(McHugh, 2010). The other training for male athletes is plyometric training, in which depth jumps are included, and these types of training are also given to male athletes(Zwierko et al., 2022).

The female-specific training for increasing muscle strength is repetitive muscle exercise, which has been proven to increase muscle strength and power. There are some important considerations for providing training to female athletes(Lisee et al., 2020). This consideration includes pelvic floor health and core stability, the hormonal changes and menstrual cycle, the factors related to pregnancy and postpartum changes, the aspect related to osteoporosis prevention, and the density of bones. At the same time, there are some important considerations for providing training to male athletes(Barker & Sargent, 2018). These considerations include muscle mass and strength, testosterone changes, mental health, and other factors. All the training provided to athletes is not gender-based. Most of the training is general, and some are individually based(Jayanthi & Dugas, 2017). In general, it has been said that those sports that need muscle strength, endurance, and speed, these sports are well played by male athletes, and those sports that require skills and abilities, these sports are performed well by female athletes(Fernandez-Fernandez et al., 2013). For example, endurance sports such as long-distance cycling can be performed well by both male and female athletes(Yanci et al., 2016). If we talk about ultra-running, it has been observed and explained by scientific studies that female athletes mostly excel in ultra-running as compared to male athletes(Eliakim et al., 2009). In gymnastics and fencing, both male and female athletes perform well, but in swimming, female athletes may excel because of greater speed and agility. All of these points are kept in mind while training both genders(Aulin, 1995). Scientific studies have also explained that female athletes suffer more from bone problems as compared to male athletes. This is because bone density and composition in female athletes depend on hormonal changes such as the concentration of estrogen. With time, when the menstrual cycle gets perturbed, bone density and composition automatically fluctuate, resulting in bone injury(Dopsaj et al., 2011).

At the same time, scientific studies also prove that the risk of cardiovascular diseases is greater in male athletes than in female athletes, so such training is provided to male athletes, which may increase endurance

relevant to cardiovascular diseases in male athletes(Magnusen & Rhea, 2009). If we talk about injury in athletes, we will learn that female athletes are more prone to injuries and also take more time in rehabilitation in case of bone Injury(Sekulic, Spasic, Mirkov, Cavar, & Sattler, 2013).

A few years ago, when there was little importance placed on the mental health of athletes, there was a total focus on increasing and maintaining their physical health. However, with time, we learned that better performance in sports results from a combination of physical and mental health(Evetovich & Eckerson, 2018). Recent studies have shown that there is more risk of depression and anxiety in female athletes as compared to male athletes; this risk may lead to mental health issues in female athletes. So along with providing training, such consulting therapies are also suggested for female athletes to perform well and to cope with depression related to failure in any case(Mancha-Triguero et al., 2021). All the studies on gender-based training programs relevant to athletes effectively explained the importance of gender-based training for enhancing performance in sports by considering athletes' gender (Shuman & Appleby, 2016).

3. Methodology:

The research describes that gender-specific response levels are related to strength and conditioning. The research was based on primary data analysis, which measured the data using SPSS software and described the results. According to the research study, differences in genders present different feedback on programs that are entirely about their strength within the people that belong to the athlete's field, and they are young. It includes all those strategies that are specific to a particular gender. All those approaches that are gender specific analyze and decide to respond to a variety of risks and susceptibilities that are related to women and girls specifically, and efforts can be made to transform the inequalities that exist between men and women. Strength and conditioning are programs in which different parts of an individual's body are developed to enhance sports activities and physical performances. After research, it came to know that proper training can improve athletes' physical performances. There are four most common rules of strength and conditioning programs which involve: 1) Specificity, 2) Individuality, 3) Overload, 4) Variation. The structure of athletes' training sessions is based on some rules, like 1) Start the game fast but end it slowly. 2) Do a heavy bench before the performance of triceps extension. 3) Perform drills speedily before the rise of the calf. 4) Purpose of strength and conditioning training.

The main objective of the performance of a strength and conditioning program is the development of muscles in some specific areas of the body. All the exercises that need to be performed periodically depend on the aims and

program that a person wants to gain. Some strength and conditioning exercises focus on core stability. There are various implications regarding gender-specific responses to strength and conditioning programs in young athletes. Those implications include a wide variety of health advantages. The main objective of this study is to analyze the consequences of multi-modal training about strength and conditioning or those training which are flexible based on cripple flexibility and energy of young males and females. This study randomly assigned 20 male and 20 female students to participate in either the multi-modal flexibility group or the strength intervention group. The tests performed before and after joining the groups of flexibility and strength are passive straight leg raise and isokinetic strength test. Let's discuss some important implications of Gender-specific responses to strength and conditioning programs in Young Athletes.

3.1 Development of Physical fitness

One of the most important physical fitness characteristics involves strength and flexibility. It plays a significant role in the achievement of healthy physical fitness. It also plays a key role in creating self-determination within young athletes. Applying these strength and conditioning programs will enhance athletes' flexibility. An experiment was performed by Santos et al. by doing extremely intense strength training for eight weeks that improved the flexibility of shoulder and trunk joints within the individuals who are young women who are extremely inactive. According to Barbosa et al., the impact of training was based on 10 weeks in which stretching exercise was not involved. This exercise enhances the test score of sit and reach with older women. According to many other studies, only strength training has the caliber to promote flexibility even among older adults. Research has found that unconventional exercises increase the flexibility of joints. Excentric exercise is an action that can increase flexibility within the lower limb region.

However, certain studies show that if there is a decrement in strength after some stretching exercises, the strength of the muscles will increase or not; it is not a sure thing. Another experiment was performed in which twelve male students of one college were made to participate in a stretching training program in which the main focus was on quadriceps and hamstring muscles. The results were an extreme muscle strength decrease after doing an acute dose of static stretching. After four weeks of this activity, no muscle strength or flexibility decrement was observed. Proprioceptive neuromuscular facilitation is such an exercise if it is performed accurately for eight weeks, then the muscle strength of specific muscles will be increased significantly, involving the muscle knee Flexora and knee extensors. Static stretching exercises can increase the muscle strength of knee flexors in individuals who are untrained young men. If this training is performed continuously for a long time, then a significant improvement in strength can be seen in different feeds between males and

females.

3.2 Gender-specific responses

Different genders give different feedback when they participate in different trainings. The effects of resistance training are based on gender. The consequences of high-velocity strength training are also significantly related to gender, and different genders give different outputs. However, in some cases, training has equal effects on both genders involving counter-movement jump height. However, the significant effects of maximal isometric force and rate of force development are certain and can only be seen within female individuals. Certain studies consider only one gender and do not think different exercises impact males and females. So, they consider the effects of both genders to be an output of individuals of one group.

3.3 Reduction in sports injuries

Training is essential for athletes capable of using their muscles and bodies to bear tough activities. Their muscles become strong and resistant to injuries or any other dangerous accident. So they perform well, and sometimes their excellence becomes more significant than that of other players. Their muscles and bodies become strong and resistant to any injury, and they can take any step during play.

3.4 Descriptive Statistical Analysis

Table 1: Result of Paired Samples Statistics

Paired Samples Statistics					
		MEAN	**N**	**STD. DEVIATION**	**STD. ERROR MEAN**
PAIR 1	Gender-Specific Responses 1	1.4800	50	.57994	.08202
	Strength 1	1.5200	50	.54361	.07688
PAIR 2	Gender-Specific Responses 2	1.4800	50	.54361	.07688
	Strength 2	1.6200	50	.66670	.09429
PAIR 3	Gender-Specific Responses 3	1.6600	50	.59281	.08384
	Conditioning Programs 1	1.5400	50	.54248	.07672
PAIR 4	Gender-Specific Responses 1	1.4800	50	.57994	.08202
	Conditioning Programs 2	1.4800	50	.54361	.07688

The above result of table 1 demonstrates that paired sample statistical

analysis results describe the mean value, standard deviation and standard error of the mean value of each pair. The first pair is gender-specific response 1, and strength1 shows that the mean value is 1.4800, and the standard deviation rate is 0.57994, which shows that 57% deviates from the mean, the standard error of the mean value is 0.08202. It also presents an 82% error of the estimated value.

Table 1 describe the second pair is gender-specific response 2, and strength 2 shows that the mean value is 1.4800 and 1.6200. Both rates show positive average values. The standard deviation rate is 54%, and 66% deviates from the mean. Similarly, pair 3 is gender-specific response three and conditioning program 1. It shows that the mean value is 1.6600 and 1.5400, the standard deviation rate is 59% and 54%, and the error value is 83% and 76% error rate between them. For example, it is generally expected that ladies, whether women or girls, wear feminine clothes. Females have a polite nature, and they can accommodate any situation. It is genetic about ladies that they appear very caring. It is expected from men that their strength is admirable. They are aggressive. Moreover, it represents a bold attitude.

Every Gender has its specific role within every society, any race-related group. Within every culture, there are certain gender-associated expectations. However, responses vary from gender to gender. The response of gender can be elaborated by the method of feedback within different circumstances, according to roles, on behalf of necessity, and the nature of the interest of men, women, girls, and boys according to the manufacture of design and application of activities, programs, and blueprints. There is a difference between gender-specific and gender-responsive terms. An individual comes under the category of gender-sensitive if he knows the impact of different facilities on individuals of different genders within society. An individual who is capable of elaborating on all the reasons that can create gender inequality within society will come under the term gender-responsive during the phase of the formation of policies for a labor market. Then, it will prove very beneficial to understand the difference between these two terminologies.

3.5 Implications

3.5.1 Gender impact on physical activity

In the present time, gender has become such a crucial factor in participating in a specific field. In this era, sports are considered a thing of involvement for males only. Individuals who are eager to participate in physical activities and compete and play well are only males. A big percentage of young athletes is also males. Ladies are less involved in such physical activities, and suppose if they participate, their objectives are different. The purpose of their play is to seek good health, whether mental or physical. Females look motivated

to play games to lose their weight. They struggle a lot during play to become an effective role model. So, it is clear that the purpose of involvement in games within different genders is different. Men want to get some awards, while ladies want to learn and experience a new Skill that can prove helpful for them in various fields.

3.5.2 Impact of gender on strength

Within adult people, gender difference strongly impacts strength, but this impact is more significant in the muscles of the upper body than in the lower body. The impact of strength is more significant within concentric contractions than in contractions of eccentric muscles. As everyone knows, the strength of males is greater than that of females. The biggest reason for this difference is that voluntary activation is high in males. One another reason for the great strength of males is their high muscle mass. Type two fibre areas also play a significant role in the high strength of males.

3.5.3 Effect of strength training on females

If a female want to participate in games and become a professional athlete, but her muscle mass is very low, leading to less muscle strength, then she should do strength training regularly. This activity is capable of enhancing the lean muscle mass within females. This will lead to a healthy and active metabolism.

Table 2: Result of Paired Samples Correlations

PAIRED SAMPLES CORRELATIONS				
		N	**CORRELATION**	**SIG.**
PAIR 1	Gender-Specific Responses 1 & Strength 1	50	-.161	.265
PAIR 2	Gender-Specific Responses 2 & Strength 2	50	.063	.663
PAIR 3	Gender-Specific Responses 3 & Conditioning Programs 1	50	.265	.063
PAIR 4	Gender-Specific Responses 1 & Conditioning Programs 2	50	-.357	.011

The above result of table 2 describes paired correlation analysis between two variables, including dependent and independent. The first pair is gender-specific responses 1 and strength1, which shows that -0.161 is a significant value of 0.265, which is negative but 26% significantly level. The second pair is gender-specific responses 2 and strength 2.

According to the result, its correlation value is 0.063, and the significant value is 0.66, showing a 66% significant rate between them. The third pair is gender-specific responses 3 and conditioning programs. According to the above result, the correlation value is 0.265, and the significant level is 0.063, showing a 26% positive correlation and a 6% significant value between them.

Table 3: Result of Paired Samples Test

PAIRED SAMPLES TEST									
		PAIRED DIFFERENCES					T	DF	SIG. (2-TAILED)
		MEAN	STD. DEVIATION	STD. ERROR MEAN	95% CONFIDENCE INTERVAL OF THE DIFFERENCE				
					Lower	Upper			
PAIR 1	Gender-Specific Responses 1 - Strength 1	-.04000	.85619	.12108	-.28333	.20333	-.330	49	.743
PAIR 2	Gender-Specific Responses 2 – Strength 2	-.14000	.83324	.11784	-.37680	.09680	-1.188	49	.241
PAIR 3	Gender-Specific Responses 3 - Conditioning Programs 1	.12000	.68928	.09748	-.07589	.31589	1.231	49	.224
PAIR 4	Gender-Specific Responses 1 - Conditioning Programs 2	.00000	.92582	.13093	-.26312	.26312	.000	49	1.000

The above result of table 3 describes that statistical analysis shows the standard deviation value, the lower bound and upper bound rate, the t-statistic value and the significant value of each pair. The significant values are 0.743, 0.241, 0.224, and 1.000, which show a 74%, 24%, and 22% significant rate. Table 3 shows that the standard deviation value is 85%, 83%, 68% and 92% deviation from the mean value. According to the result, its mean value is 0.04000, -0.14000, 0.12000, and 0000, respectively, showing positive and negative rates.

Table 4: Result of Model Summary

Model Summary				
MODEL	**R**	**R SQUARE**	**ADJUSTED R SQUARE**	**STD. ERROR OF THE ESTIMATE**
1	.563[a]	.317	.239	.47319

a. Predictors: (Constant), Strength 2, Gender-Specific Responses 1, Gender-Specific Responses 2, Gender-Specific Responses 3, Strength 1

The above result of table 4 describes that the model summary result shows that the R square value is 0.317, the adjusted R square rate is 0.239, and the standard error of the estimated value is 0.47, showing 47% of the estimated value. The R rate is 0.563, which shows that 56% model fit for analysis.

Table 5: Result of ANOVA[a]

ANOVA[a]						
MODEL		**SUM OF SQUARES**	**DF**	**MEAN SQUARE**	**F**	**SIG.**
1	Regression	4.568	5	.914	4.080	.004[b]
	Residual	9.852	44	.224		
	Total	14.420	49			

a. Dependent Variable: Conditioning Programs 1

The above result of table 5 describes that the ANOVA test analysis result represents the sum of square value, the mean square value, and the F statistic and significant value of each model, including residual and regression. The sum of square rates is 4.568, 9.852, and 14.420, all of which are considered positive values. The mean square rate is 91%, and the average square value is 22%. The significant value is 0.004; it shows a 4% significant difference between them.

Table 6: Result of Coefficients

COEFFICIENTS						
MODEL		**UNSTANDARDIZED COEFFICIENTS**		**STANDARDIZED COEFFICIENTS**	**T**	**SIG.**
		B	Std. Error	Beta		
1	(Constant)	.950	.410		2.319	.025
	Gender-Specific Responses 1	-.307	.122	-.328	-2.520	.015
	Gender-Specific Responses 2	.149	.148	.149	1.007	.319
	Gender-Specific Responses 3	.089	.122	.098	.732	.468
	Strength 1	.217	.153	.218	1.421	.162
	Strength 2	.212	.111	.261	1.909	.063

a. Dependent Variable: Conditioning Programs 1

The above result of table 6 describes the linear regression analysis between gender-specific responses and conditioning programs. The result demonstrates the beta value, standard error value, the t statistic value and significant value. The gender-specific response 1 shows that the beta value is -0.328, the t-statistic value is -2.520 the significant value is 0.015, showing that there is a 15% significant value between them. table-6 describes the gender-specific responses 2 and gender-specific responses 3 these show that the significant rate is 0.015 and 0.319, the t statistic value is 1.007, and -2.520 shows the positive and negative rates. Strengths 1 and 2 are both considered mediator variables. According to the result, their significant levels are 0.162 and 0.063, showing that 16% and 6% are significantly different between them.

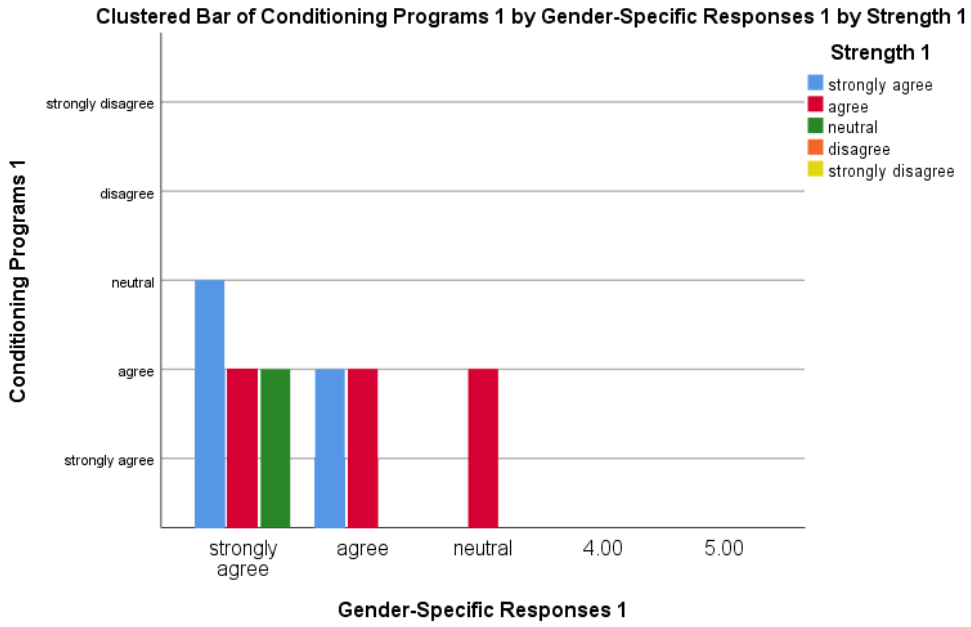

Figure 1: Clustered Bar of Conditioning Program 1 by Gender-Specific Responses 1 by Strength1

The above graph of figure 1 represents the relationship between gender-specific responses and conditioning programs. The vertical side shows the levels of strongly agree, strongly agree, neutral, disagree, and strongly disagree. The horizontal side describes the same fact. The blue bar represents a strong relationship between gender-specific responses and conditioning programs as shown in Figure 1.

4. Conclusion

The output of these implications is that different activities performed during strength and conditioning programs have different impacts on males and females. Certain activities enhance the strength of muscles in males, but those activities decrease the caliber of muscle strength in females. Moreover, certain things have no specific impact on males and females. Both genders give the

same results. The main objective of this article is to draw attention to the Gender-specific responses to strength and conditioning programs in young athletes, as males are naturally strong to some extent. After some strength and conditioning training, they become fit for athlete field involvement. However, females have to do a lot of practice and involvement in strength and conditioning programs because it will burn their energy throughout the day, which will cause muscle mass to lean. Strength and conditioning programs can improve the composition of the body within individuals. To conclude, it can be justified that both genders show differences in their bodily features, and therefore, their performance is affected during different strength and conditioning sessions; however, with properly tailored exercises and sessions, coaches can lead to an effective rise in performance for both genders depending upon their body requirements. It also depends upon the strength-gaining session and sport on how different genders behave differently for a positive outcome on the field while embracing their distinct body features and strengths one way or another. For example, typical household chores involve certain specific tasks. Girls are considered responsible for cooking and completing cleaning projects, while work related to out-of-home and repair work comes under the responsibility of boys. Individuals pressure and bully their younger siblings if their reaction is not according to the conventional norms, such as if girls like to do cycling or sports and boys like to play with dolls, etc. The gender identity of anyone is its capability to recognize who he is. That can be a male, female, or any other gender. All those characteristics and attitudes that can be built socially come under gender roles. These are all those principles and rules that can be described on behalf of well-reputed gender. Responsiveness that is gender-based is so important that it has the calibre of promoting equality by struggling hard against all those distinctions that are gender-based. All those favors are ignored that are related to Gender specificity. Its objective is to develop this surety within all individuals of society to avail all the facilities, resources, and processes related to decision-making without focusing on their gender. Don't waste your energies on things fixed for males; these terms are specific for females.

References

Aulin, K. P. (1995). Gender-specific issues. *Journal of sports sciences, 13*(S1), S35-S39.

Barker, K., & Sargent, D. (2018). *Strength and Conditioning for Female Athletes*: The Crowood Press.

Cai, G., Qiu, J., Chen, S., Pan, Q., Shen, X., & Kang, J. (2019). Hematological, Hormonal and Fitness Indices in Youth Swimmers: Gender-Related Comparisons. *Journal of human kinetics, 70*(1), 69-80.

Celada, O., García-Cota, J., Herrero-González, H., Martínez-Rodríguez, R., Galán-del-Rio, F., Rodríguez-Iñigo, E., . . . Lopez-Alcorocho, J. (2021). Study of Injuries in the Spanish Men's National Soccer Team(2008-2015).

Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte, 21(84). doi:https://doi.org/10.15366/rimcafd2021.84.003

Dean, W. P., Nishihara, M., Romer, J., Murphy, K. S., & Mannix, E. T. (1998). Efficacy of a 4-week supervised training program in improving components of athletic performance. *The Journal of Strength & Conditioning Research, 12*(4), 238-242.

Dopsaj, V., Martinovic, J., Dopsaj, M., Stevuljevic, J., & Bogavac-Stanojevic, N. (2011). Gender-specific oxidative stress parameters. *International journal of sports medicine, 32*(01), 14-19. doi:10.1055/s-0030-1267930

Eliakim, A., Portal, S., Zadik, Z., Rabinowitz, J., Adler-Portal, D., Cooper, D. M., . . . Nemet, D. (2009). The effect of a volleyball practice on anabolic hormones and inflammatory markers in elite male and female adolescent players. *The Journal of Strength & Conditioning Research, 23*(5), 1553-1559. doi:10.1519/JSC.0b013e3181aa1bcb

Evetovich, T. K., & Eckerson, J. M. (2018). Age and gender training considerations. In *Conditioning for Strength and Human Performance* (pp. 572-599): Routledge.

Fang, K., & Jiang, H. (2024). Gender-Specific Effects of Short Sprint Interval Training on Aerobic and Anaerobic Capacities in Basketball Players: A Randomized Controlled Trial. *Journal of Sports Science and Medicine, 23*(1), 8-16.

Fernandez-Fernandez, J., de la Aleja Tellez, J. G., Moya-Ramon, M., Cabello-Manrique, D., & Mendez-Villanueva, A. (2013). Gender differences in game responses during badminton match play. *The Journal of Strength & Conditioning Research, 27*(9), 2396-2404. doi:10.1519/JSC.0b013e31827fcc6a

Jayanthi, N. A., & Dugas, L. R. (2017). The risks of sports specialization in the adolescent female athlete. *Strength & Conditioning Journal, 39*(2), 20-26.

Kushner, A. M., Kiefer, A. W., Lesnick, S., Faigenbaum, A. D., Kashikar-Zuck, S., & Myer, G. D. (2015). Training the developing brain part II: Cognitive considerations for youth instruction and feedback. *Current sports medicine reports, 14*(3), 235-243.

Lisee, C. M., DiSanti, J. S., Chan, M., Ling, J., Erickson, K., Shingles, M., & Kuenze, C. M. (2020). Gender differences in psychological responses to recovery after anterior cruciate ligament reconstruction before return to sport. *Journal of Athletic Training, 55*(10), 1098-1105.

Magnusen, M. J., & Rhea, D. J. (2009). Division I athletes' attitudes toward and preferences for male and female strength and conditioning coaches. *The Journal of Strength & Conditioning Research, 23*(4), 1084-1090.

Mancha-Triguero, D., García-Rubio, J., Gamonales, J. M., & Ibáñez, S. J. (2021). Strength and speed profiles based on age and sex differences in young basketball players. *International journal of environmental research and public health, 18*(2), 643. doi:10.3390/ijerph18020643

McHugh, M. (2010). Oversized young athletes: a weighty concern. *British Journal of Sports Medicine, 44*(1), 45-49.

McMahon, G., Morse, C. I., Winwood, K., Burden, A., & Onambélé, G. L. (2018). Gender associated muscle-tendon adaptations to resistance training. *PLoS One, 13*(5), e0197852.

Mueller, J., Mueller, S., Stoll, J., Baur, H., & Mayer, F. (2014). Trunk extensor and flexor strength capacity in healthy young elite athletes aged 11–15 years. *The Journal of Strength & Conditioning Research, 28*(5), 1328-1334. doi:10.1519/JSC.0000000000000280

Onambele-Pearson, G. L., & Pearson, S. J. (2012). The magnitude and character of resistance-training-induced increase in tendon stiffness at old age is gender specific. *Age, 34*, 427-438.

Quatman, C. E., Ford, K. R., Myer, G. D., Paterno, M. V., & Hewett, T. E. (2008). The effects of gender and pubertal status on generalized joint laxity in young athletes. *Journal of science and medicine in sport, 11*(3), 257-263.

Scanlan, A. T., Dascombe, B. J., Kidcaff, A. P., Peucker, J. L., & Dalbo, V. J. (2015). Gender-specific activity demands experienced during semiprofessional basketball game play. *International journal of sports physiology and performance, 10*(5), 618-625.

Sekulic, D., Spasic, M., Mirkov, D., Cavar, M., & Sattler, T. (2013). Gender-specific influences of balance, speed, and power on agility performance. *The Journal of Strength & Conditioning Research, 27*(3), 802-811.

Shuman, K. M., & Appleby, K. M. (2016). Gender preference? National collegiate athletic association division I student-athletes and strength and conditioning coaches. *The Journal of Strength & Conditioning Research, 30*(10), 2924-2933. doi:10.1519/JSC.0000000000001384

Smith, J. W., Holmes, M. E., & McAllister, M. J. (2015). Nutritional considerations for performance in young athletes. *Journal of sports medicine, 2015*.

Suárez-Rodríguez, D., & del Valle, M. (2019). Escala de Borg e intensidad en entrenamientos de carrera y específicos de tenis. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte, 19*(75), 399-413. doi:10.15366/rimcafd2019.75.002

Yanci, J., Cámara, J., Vizcay, J., & Young, W. (2016). Examining age and gender effects in physical performance in young athletes aged 12–16 years. *International journal of sports science & coaching, 11*(4), 538-544.

Zwierko, T., Nowakowska, A., Jedziniak, W., Popowczak, M., Domaradzki, J., Kubaszewska, J., . . . Ciechanowicz, A. (2022). Contributing factors to sensorimotor adaptability in reactive agility performance in youth athletes. *Journal of human kinetics, 83*(1), 39-48.