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Efectividad de los ejercicios de fortalecimiento sobre las habilidades de pensamiento positivo, el bienestar psicológico y la fuerza mental en atletas con una rodilla desgarrada en el menisco

Effectiveness of Strengthening Exercises on Positive Thinking Skills, Psychological Wellness and Mental Strength in Athletes with a Meniscus-Ripped Knee

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Resumen

Este estudio tiene como objetivo examinar la influencia del pensamiento positivo, el bienestar psicológico y la fortaleza mental en el proceso de recuperación después de ejercicios de fortalecimiento en personas diagnosticadas con un desgarro de menisco en la rodilla. La cohorte de investigación comprende 32 atletas diagnosticados con un desgarro de menisco mediante imágenes por resonancia magnética (IRM). De estos participantes, 26 son hombres y 6 mujeres, todos mayores de 18 años, practican deportes amateurs en diversas disciplinas y han sufrido lesiones durante actividades deportivas. Los participantes fueron asignados aleatoriamente a dos grupos: Grupo A (experimental, n=16) y Grupo B (control, n=16). El estudio adopta un modelo mixto que incorpora metodologías experimentales, de encuesta y relacionales. El modelo experimental utiliza el método experimental con diseño de grupo de control pretest-seguimiento y posttest. Durante un período de 8 semanas, los participantes realizan ejercicios y cada sesión de entrenamiento comprende 10 repeticiones realizadas dos veces al día. Las evaluaciones que utilizan las escalas de pensamiento positivo, bienestar psicológico y resiliencia mental se realizan durante las etapas de prueba previa, prueba de seguimiento y prueba posterior a lo largo de la duración del estudio. El análisis de los resultados de la investigación revela puntuaciones medias en las escalas de pensamiento positivo y bienestar psicológico por encima del nivel medio, mientras que las puntuaciones en la escala de fortaleza mental se aproximan al nivel medio. El estudio concluye una correlación positiva moderada, aunque estadísticamente insignificante, entre las puntuaciones de las escalas de pensamiento positivo, bienestar psicológico y fortaleza mental. Significativamente, los participantes, guiados por un fisioterapeuta, exhiben una tasa de recuperación más rápida en comparación con el grupo de control. En consecuencia, se infiere que la incorporación de apoyo psicológico junto con ejercicios físicos contribuye a un proceso de recuperación acelerado.

Palabras Clave

menisco, ejercicio, pensamiento positivo, bienestar psicológico, fortaleza mental

Abstract

This study aims to examine the influence of positive thinking, psychological well-being, and mental toughness on the recovery process following strengthening exercises in individuals diagnosed with a meniscus tear in the knee. The research cohort comprises 32 athletes diagnosed with a meniscus tear through Magnetic Resonance Imaging (MRI). Of these participants, 26 are male, and 6 are female, all aged above 18, engaged in amateur sports across diverse disciplines, and having sustained injuries during athletic activities. The participants were randomly assigned to two groups: Group A (experimental, n=16) and Group B (control, n=16). The study adopts a mixed model incorporating experimental, survey, and relational methodologies. The experimental model utilizes the experimental method with pretest-follow-up test and posttest control group design. Over an 8-week period, participants engage in exercises with each training session comprising 10 repetitions conducted twice daily. Assessments using the Positive Thinking, Psychological Well-Being, and Mental Resilience scales occur during the Pre-Test, Follow-up Test, and Post-Test stages throughout the study duration. Analysis of the research results reveals mean scores for positive thinking and psychological well-being scales above the medium level, whereas mental toughness scale scores approximate the middle level. The study concludes a moderate, yet statistically insignificant, positive correlation among positive thinking, psychological well-being, and mental toughness scale scores. Significantly, participants, guided by a physical therapist, exhibit a faster recovery rate compared to the control group. Consequently, it is inferred that the incorporation of psychological support alongside physical exercises contributes to an accelerated recovery process.

Keywords

meniscus, exercise, positive thinking, psychological well-being, mental toughness

I Introduction

Sports are a versatile activity that plays an important role in improving individuals' physical health and improving their overall quality of life (Smith & Johnson, 2018). Research shows that regular exercise supports cardiovascular health and reduces the risk of obesity (Brown & Miller, 2020). Additionally, team sports that encourage social interaction can increase communication between individuals and create a sense of community (Jones & Smith, 2019). However, in addition to the physical advantages of sports, there is also the potential to improve mental health; activities such as yoga can help reduce stress and improve mental health. It can provide positive effects on increasing focus (Green & White, 2021).

Meniscal tears refer to the damage of the crucial structural component known as the meniscus in the knee joint. According to recent studies, meniscal tears are often associated with sporting activities or abrupt bending movements of the knee. Numerous epidemiological investigations indicate an increased risk of meniscal tears, particularly in high-impact sports such as football, basketball, and skiing (Smith & Johnson, 2018). The rapid rotational and sudden stopping movements inherent in these sports may subject the meniscus tissue to excessive loading, predisposing it to tears. Various risk factors, including age, gender, genetic factors, obesity, and degenerative changes in the knee joint, have been identified as contributors to the likelihood of meniscal tears (Brown & Smith, 2019; White & Jones, 2021). These factors amplify the susceptibility to meniscal injuries, emphasizing the multifaceted nature of the etiology.

Research on the relationship between physical activity and meniscal tears suggests that engaging in regular and appropriate physical activity can mitigate the risk of meniscal tears by preserving knee health (Robinson & Brown, 2017). Proper exercise programs can enhance knee joint stability and strengthen muscles, thereby increasing the resilience of the meniscus and reducing the risk of injury. However, it is crucial to note that improper or excessive exercise, particularly in high-impact sports, can contribute to the occurrence of meniscal tears. Therefore, individuals are encouraged to undergo a thorough physical

assessment and establish a tailored exercise program before engaging in sports to safeguard meniscal health. This proactive approach is pivotal in injury prevention and aligns with the notion that well-designed exercise interventions can contribute to maintaining knee joint integrity (Gonzalez-Iglesias et al., 2020; Kim & Lee, 2021).

Sports psychologists have extensively explored the impact of psychological skill training, also known as 'mental skills. Psychological skill training is a systematic approach to studying and enhancing various psychological aspects of performance, aiming to improve overall performance and provide greater personal satisfaction during physical activities (Weinberg & Gould, 2014). Comprehensive programs encompass a wide array of psychological skills training, including concentration, motivation, self-control (will), relaxation techniques, communication, confidence, imagery (mental training), and self-talk (Thelwell et al., 2010). Research has consistently demonstrated that elite athletes exhibit high levels of self-confidence and motivation, coupled with lower anxiety levels compared to their amateur counterparts. Elite athletes are characterized by their intense focus on performance and superior mental preparedness for competition (Mahoney et al., 1987; Mahoney, 1989).

Positive psychology, which has made progress in a new field of psychology, is important today (Uzbař, 2015). Positive psychology can reveal the spiritual competence of the individual depending on his ability to cope with changing situations. It also aims to understand the strengths and skills of individuals, to improve their social relations positively, and to develop them (Paludo & Koller, 2007). Positive psychology; It is a discipline that aims to improve the positive characteristics of the individual, to have positive experiences, and to protect mental health with programs aimed at increasing subjective well-being (Seligman & Csikszentmihalyi, 2000). There are some assumptions in positive psychology. One of them is that the individual is an active being that can provide his development. The second is that the individual has the necessary inner strength to change and regulate his behavior. Third, behavioral change in positive psychology motivates the individual to hold on to life (Akın-Küçük & Küçük, 2004).

Mental toughness is a general term used by athletes, coaches, and the media to express the superior characteristics of athletes who excel in both training and competitive situations while others fail. Especially at the elite level, it is "mental performance" that makes the difference among athletes (Gould et al., 1993: 85). For example; Athletes who "reach a certain level" and "remain at a certain level for a long time" (Kreiner et al., 1993: 31), "athletes who struggle on the big stage and cannot" (Gould et al., 1993: 86) and change or It is also stated that it creates the difference between "athletes who develop and those who do not" (Sinclair and Orlick, 1993: 32) during transition periods. Some examples of work that distinguish the current study from others;

- According to a study conducted by Donohue in 2019, Meniscal injuries in young, active patients present a challenge for orthopaedic surgeons aiming to facilitate a pain-free return to play/military duty while preserving maximal meniscal integrity.
- According to Sliepka' s study (2022), There is a significant decrease in the negative predictive value (NPV) of Magnetic Resonance Imaging (MRI) to identify medial meniscus tears in patients who undergo Anterior Cruciate Ligament Reconstruction (ACLR) greater than 6 months after imaging.
- The sensitivity and specificity of MRI to predict a medial meniscus tear in the entire cohort was 79% and 80%, respectively.
- According to Sorey et al. (2023), Surgical delay decreased the incidence of medial meniscal repair in young athletes by 7% per month from the time of injury. No similar relationship was found between lateral meniscal repair and time to surgery.
- According to Wolf and Gulbrandsen (2020), older athletes are relatively healthier and have a strong desire to return to sport despite knee injury and degenerative meniscal changes and lower extremity loading increase the risk of meniscal tear in older athletes (Figure 1).

The aim of this study was to examine the effects of positive thinking, psychological well-being and mental endurance levels on the recovery levels as a result of strengthening exercises in individuals with a meniscus tear in the knee.

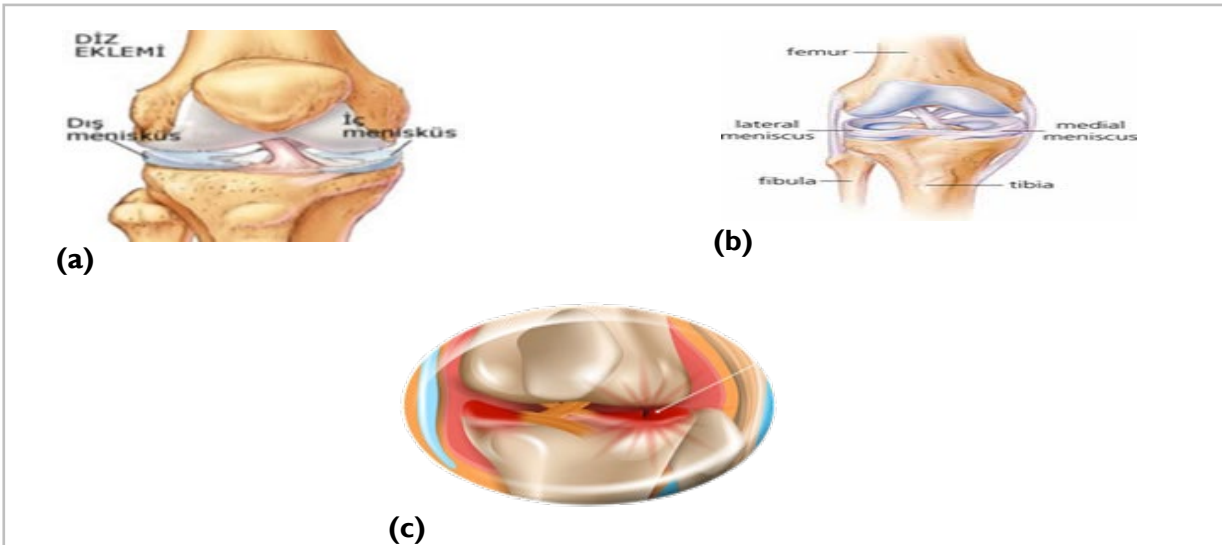


Figure 1. Meniscus and Tear.

Nota: a) Medial and lateral meniscus. Adapted from “Meniscus Tear”, by Seth, 2024, *Gamrad Orthopedics*; b) Femur. Adapted from “Menisküsler”, by Destan, 2024; and c) Meniscus Tear. Adapted from “Meniscal Tears: Repair Vs. Resection”, by LMcG Orthopaedics, 2024).

2 Methodology

In this study, a mixed-methods approach was employed, combining both qualitative and quantitative data to provide a comprehensive understanding of the research questions (Gay et al., 2012; Fraenkel et al., 2012). The research design encompasses experimental, survey (descriptive), and relational models.

2.1 Research Model

In the study, first of all, a detailed theoretical framework was prepared regarding the subject of the research in terms of variables by examining the relevant literature. Afterward, the relationship between psychological well-being and mental resilience and positive thinking levels was revealed by using the scales related to the research subjects, in which the hypotheses prepared in the light of the theoretical framework were tested and the data of the quantitative part of the research were obtained. The analysis of the research data was evaluated using the SPSS for Windows 25.00 statistical package program.

2.2 Research Group

The study includes 26 male and 6 female participants, all above the age of 18, engaging in amateur sports across various disciplines. These individuals sustained injuries during their sporting activities in the physiotherapy department of a hospital located in the Central District of Konya province in 2022. The participants included in the study were chosen from amateur athletes who were previously involved in sports.

Table 1. Distribution of participants by gender variable.

Personal Specialities of Participants			N	%
Gender	Study Group	Male	14	87,5
		Female	2	12,5
		Total	16	100,0
	Control Group	Male	12	75,0
		Female	4	25,0
Education Status	Associate Degrees		10	31,3
	Licence		22	68,8
	Sports Type	Individual Sports	10	31,3
Team Sports		22	68,8	

2.3 Research Treatment

The athletes participating in the study were randomly divided into groups A and B, and two groups were formed the study group (n = 16) and the control group (n = 16). Care was taken to have a diagnosis of a meniscus tear in the knees of the participants and to have Magnetic Resonance Imaging (MRI) reports showing this diagnosis. In addition, Magnetic Resonance Imaging (MRI) reports showing the diagnosis of meniscus tear were also obtained from the participants in writing and added to the study file. A signed consent form was obtained from the participants included in the study. With this participation approval, the personal information of the participants was recorded in the first evaluation with their permission.

2.4 Data Collection Tools

In the first evaluation, positive thinking skills, psychological well-being, and mental toughness scales were filled in by the athletes in the experimental and control groups as the data collection tools. Their Cronbach Alpha internal consistency coefficients were calculated as .68 for the positive thinking skills, as .84 for the psychological well-being and as .75 for the mental toughness. These results were recorded as the initial evaluation. After this step, "*Goal Setting, Self-talk and Visualization*" activities were organized to apply activities related to positive thinking, psychological well-being, and mental toughness only to the athletes in the experimental group for eight weeks.

Afterward, an exercise prescription consisting of 4 exercises for strengthening the muscles around the knee was given as homework and they were asked to do these exercises twice a day, in the morning and evening, for four weeks until the second evaluation. Four weeks after the first evaluation, the athletes were asked to fill in the positive thinking skills, psychological well-being, and mental toughness scales again to make an interim evaluation, and they were asked to continue the exercise program for four more weeks until the third evaluation.

At the end of the eighth week, "*Goal Setting, Self-talk and Revitalization*" activities were organized for the athletes to apply activities related to positive thinking, psychological well-being, and mental toughness in the evaluation, which is the post-test, for eight weeks, and positive thinking skills, psychological well-being and mental toughness scales were filled again. After the third evaluation, the scales filled in three times were recorded.

2.5 Analysis of Data

- Used appropriate statistical tests (e.g., t-tests, ANOVA) to compare baseline characteristics between groups
- Employed post-hoc tests to identify specific time points or groups showing significant differences

The Steps of the Experimental Procedure

- It was explained to the participants that this research was completely voluntary, necessary permissions were obtained, and study and control groups were formed.
- Weekly plans were made for positive thinking, psychological well-being, and mental endurance activities during the treatment process in the study group.
- Before the exercise prescription was given to the participants in the study group, information was given about the process of positive thinking, psychological well-being, and mental resilience.
- Data collection tools used in the research were applied as a pre-test, follow-up, and post-test. However, the follow-up test was not applied to the control group.
- Activities related to positive thinking, psychological well-being, and mental resilience were applied for eight weeks. Activities: It consists of "Goal Setting, Self-talk, Visualization" methods.
- Necessary corrections were made by intervening in the situations encountered during the experimental application.
- After the experimental procedure, the post-test was applied and the experimental procedure was terminated.

2.6 Ethical Aspect of Research

We affirm that our study methods adhered to the Journal of Applied Psychology methodological checklist. The data of the study were collected between April and May 2023 with the ethics committee approval permission from University Social and Human Scientific Research Ethics Committee (Date: 10.01.2023, Decision No: 2023/10) and subsequently with the permission of the Provincial Directorate of National Education and SAC Directorate.

Exercise prescription is given to athletes as homework (knee exercises):

1. Quadriceps isometric

Sit with your sick leg straight and your other leg bent. Contracting your thigh muscle, press the back of your knee toward the floor. Hold this position for 5 seconds, then relax. Do 10 repetitions, 2 times a day (Figure 2).



Figure 2. Quadriceps isometric.

2. Straight leg raise

Lie down, supporting your torso with your elbows. Keep your sick leg straight, the other knee bent, and the sole on the floor. Contract the thigh muscles of the sick leg and slowly lift 15-25 cm from the floor. remove it. Hold this position for 5 seconds and relax. Do 10 repetitions, 2 times a day (Figure 3).



Figure 3. Straight leg raise.

3. Hip abduction

Lie on your side with the patient's leg up and bend the lower leg for support. Keeping the top knee straight, slowly raise the leg up to 45 degrees. Maintain this position for 5 seconds. Slowly lower the leg and relax for 2 seconds. Do 10 repetitions, 2 times a day (Figure 4).



Figure 4. Hip abduction.

4. Prone straight-leg raise

Lie facedown with legs straight. Contract the hamstrings and lift your leg as high as you can. Maintain this position for 5 seconds. Lower the leg and rest for 2 seconds. Do 10 repetitions, 2 times a day (Figure 5).



Figure 5. Prone straight leg raise.

3 Results

The data and comments on the demographic characteristics of the participants participating in the research are given below. Looking at Table 2, it is understood that according to the Skewness-Kurtosis normality test result related to the general positive thinking, psychological well-being, and mental toughness scale, all dimensions are -2 to +2, so it is suitable for normal distribution. In addition, the Levene test value was determined as .90. When these values are examined, it is seen that the dependent variables provide the assumption of normal distribution and the homogeneity of variance-covariance matrices. The analysis was continued as all assumptions were met.

When the table is examined, the positive thinking mean scores of the participants in the study and control groups were examined. As a result of this examination, the positive thinking scale mean scores of the participants included in the study were above the moderate level with Mean=49.75, the mean psychological well-being scale mean scores were above the moderate level with Mean=140.06, the mental toughness scale mean scores were Mean= It is understood that it is at a level close to the medium level with 129.19.

Table 2. Descriptive statistics of positive thinking, psychological well-being, and mental resilience scores by experiment and control groups.

		N	\bar{X}	Ss	Skewness	Kurtosis	Levene test	Min.	Max.
Study Group and Control Group	Positive thinking	32	49,75	10,32	-1,109	1,483	,376	22	65
	Psychological well-being	32	140,06	11,71	-,656	1,122	,348	106	157
	Mental Endurance	32	129,19	13,07	-,209	-,755	,388	105	151

The group's positive thinking, psychological well-being, and mental toughness score averages were examined according to the results of the pre-test before the exercise and psychological training to be applied to the participants in the experimental group. As a result of this examination, the pre-test positive thinking scale mean score of the participants included in the study was above the moderate level with Mean=15.81, the mean psychological well-being scale means the score was above the moderate level with Mean=46.12, and the mental toughness scale means score was Avg. It is seen that it is above the medium level with .=43.00.

According to the results of the follow-up test performed at the end of the exercise and psychological training applied to the participants in the experimental group for four (4) weeks, the group's positive thinking, psychological well-being, and mental endurance score averages were examined. As a result of this examination, it was determined that the follow-up test positive thinking scale mean scores of the participants included in the study were above average with Mean=16.50, their psychological well-being scale mean scores were high with Mean=46.69, and their mental toughness scale mean scores were Avg. It is seen that it is at a high level with =45.87.

According to the results of the post-test after the exercise and psychological training to be applied to the participants in the experimental group, the positive thinking scale means a score of the group was above the medium level with Mean=17.44, and the mean score on the psychological well-being scale was high with Mean=48.25. and mental toughness scale mean scores are at a very high level with Average=43.31.

Positive thinking, psychological well-being, and mental toughness mean scores of the participants in the control group were examined. As a result of this examination, the pre-test positive thinking scale means the score of the participants included in the study was below the moderate level with a Mean = 12.81, the mean psychological well-being scale mean score was slightly above the moderate level with a Mean = 44.26,

the mental toughness scale score It is understood that the averages are close to the medium level with Av.=41.00.

Positive thinking, psychological well-being, and mental toughness scale mean scores of the participants in the control group were examined. As a result of this examination, the post-test positive thinking scale means the score of the participants included in the study was below the moderate level with Mean = 13.50, the mean score on the psychological well-being scale was at a moderate level with Mean = 44.67, and the mental toughness scale mean score averages. It is understood that it is at a moderate level with a mean=35.25.

Table 3. Descriptive statistics of pre-test, follow-up test, and post-test results of positive thinking, psychological well-being, and mental resilience scores according to the experimental and control groups.

			N	\bar{X}	Ss	Min.	Max.
Study Group	Positive thinking	First test	16	15,81	3,78	6	20
		Following test	16	16,50	3,31	8	22
		Last test	16	17,44	4,03	8	24
	Psychohlogical wellbeing	First test	16	46,12	4,86	34	55
		Following test	16	46,69	3,89	35	52
		Last test	16	48,25	3,84	37	54
	Mental Endurance	First test	16	43,00	4,83	35	50
		Following test	16	45,87	4,83	35	51
		Last test	16	43,31	4,58	25	51
Control Group	Positive thinking	First test	16	12,81	3,78	6	20
		Last test	16	13,50	3,54	7	21
	Psychological well being	First test	16	44,26	4,35	33	52
		Last test	16	44,67	3,52	38	50
	Mental Endurance	First test	16	41,00	4,67	33	51
		Last test	16	35,25	4,22	20	50

When the table is examined, as a result of the Spearman Product Moment Correlation analysis performed to determine the relationship between the scores obtained from the positive thinking scale dimension and the psychological well-being scale test scores, there is a moderate relationship ($r=,601; p<.05$) and the Spearman Product Moment Correlation analysis performed to determine the relationship between the scores obtained from the positive thinking scale dimension and the mental toughness scale test scores, it was found that there was a moderate relationship between the scores at the $p<.05$ level, but not statistically significant. ($r=.658; p<.05$) is understood.

Table 4. Spearman product moment correlation analysis results to determine the relationship between positive thinking scale scores and psychological well-being and mental resilience scale test scores.

Positive thinking	N	R	p
Psychological well being	32	,601	,124
Mental endurance	32	,658	,830

When the figure is examined, the pre-test MR report submitted by an amateur athlete while participating in the study is seen. Severe tears are seen in both menisci. Again, the report of the new MRI taken by the same athlete after the training is seen. Meniscal tears are not seen on the first MRI and both menisci were evaluated as normal.

4 Discussion

The average score of the positive thinking and psychological well-being scale applied before the exercises and positive thinking, psychological well-being, and mental resilience activities of the participants with a meniscus tear in the knees who participated in the study was above the medium level, but the mean score of the mental toughness scale was close to the medium level. it can be concluded that.

Initial assessment (Pre-Test); Positive thinking skills, psychological well-being, and mental toughness scales were filled in both the experimental and control groups. According to the results obtained as a result of this evaluation.

According to the results of the pre-test performed before the “*Goal Setting, Self-talk and Imagination*” informative pieces of training for the exercise and psychological well-being, positive thinking and mental resilience to be applied to the participants in the study group, the mean score of the positive thinking scale was above the medium level, it was above the medium level. It can be concluded that they have psychological well-being levels and the mean scores on the mental toughness scale are above the medium level.

According to the pre-test results of the participants in the control group, it can be concluded that the mean score on the positive thinking scale is below the medium level, they have a moderate level of psychological well-being, and the mean score of the mental toughness scale is close to the middle level.

According to the study by Çelik et al. (2020), it was stated that the positive thinking skills of the athletes were better than the sedentary individuals. In his study on elite tennis players, Tazegül (2018) concluded that the positive thinking skill levels of elite tennis players are above the medium level. Tazegül (2016), in his study on physically disabled athletes, reported that the positive thinking skill levels of physically disabled athletes are above the medium level. When the results of the studies are examined in terms of positive thinking skill levels and evaluated together with the findings obtained from the current study; appear to support the present study. Accordingly, we think that exercising positively affects positive thinking skills.

Second assessment (Follow-up Test); After four (4) weeks, only the athletes in the experimental group were given “*Goal Setting, Self-talk and Imagination*” technical information pieces of training for psychological well-being, positive thinking and mental toughness before the exercise, which was determined to be applied for the treatment of meniscus tear in their knees at the end of four (4) weeks. At the end of the exercises at the end of the week, positive thinking skills, psychological well-being, and mental toughness scales were filled. According to the results obtained as a result of this evaluation.

It can be concluded that the mean score of the positive thinking scale is above the medium level, the mean score of the psychological well-being scale is high, and the mean score of the mental toughness scale is also high. Başar (2018) stated that individuals who exercise regularly have high levels of psychological well-being. Karaçam and Pular (2019), in their study on physical education and sports teachers, reported that the psychological well-being levels of physical education and sports teachers are above the medium level. Gönener et al., (2017), in their study on the students of the faculty of sports sciences, concluded that the students' psychological well-being levels are at a high level. When the results of the studies are considered in terms of general psychological well-being levels and evaluated together with the findings obtained from the current study; It is understood that some studies support the present study. Accordingly, we think that exercising has a positive effect on psychological well-being.

Third assessment (Post Test); At the end of the eighth (8th) week, the athletes in the study and control groups were given technical information pieces of training on “*Goal Setting, Self-talk and Imagery*” for psychological well-being, positive thinking, and mental endurance after the exercise, which was determined to be applied for the treatment of meniscus tear in the knees. At the end of the psychological training at the end of the week, positive thinking skills, psychological well-being, and mental toughness scales were filled. According to the results obtained as a result of this evaluation.

It was concluded that the positive thinking scale means the score of the study group was above the medium level, the mean score of the psychological well-being scale was high, and the mean score of the mental toughness scale was quite high.

It was concluded that the positive thinking scale mean scores of the control group were below the medium level, the mean scores of the psychological well-being scale were at moderate levels, and the mean scores of the mental toughness scale were moderate. According to the study conducted by Tekkurşun and Türkeli (2019), it was concluded that the level of mental endurance is higher in individuals who follow the exercise program regularly. When the findings of the study conducted by Yardımcı et al. (2017) were examined, it

was reported that the mental endurance values in sports were above the medium level. Temel and Karharman (2019) concluded in their study on handball players that the total mental endurance levels of the athletes are close to the middle level. According to the results of the mental toughness scale in the outcome evaluation of the participants included in the study group in this study, the mental toughness levels of the athletes who regularly comply with the exercise program also showed positive development.

5 Conclusion

Most of the amateur athletes who participated in the study showed positive progress toward recovery. With the strengthening of the muscles around the knees along with the exercises, the self-confidence of the participants increased and their mobility improved. Athletes who stated that they were mobilized more independently in all their movements also verbally stated that their balance, coordination, and control skills increased and stated that they benefited greatly from the practices.

The positive developments recorded were recorded through the scales used in the evaluations. As can be seen in the final evaluations of the psychological well-being, positive thinking skills, and mental toughness scales, almost all of the participants showed improvement and progressed psychologically. At the same time, in addition to psychological improvements, many athletes stated that they did not experience knee pain in the future. It has been observed that many of the athletes who have resolved their concerns about the meniscus tear have started to heal the meniscus tear. It can be concluded that the meniscal tears seen in the previous MRI were not seen in the new MRIs of some athletes who had re-Mr. The previous and subsequent MRI reports of a participant who had a new MRI after the study and whose meniscus tear was not observed in the MRI report and whose menisci were observed to be completely normal can be seen in the findings section.

- As a result, according to this evaluation, together with the exercises performed and the psychological good developments observed, physical improvement and positive developments were observed in the participants.
- As a result of the relationship evaluation, there is an insignificant but moderate relationship between the positive thinking scale and psychological well-being scale test scores ($r=.601$; $p<.05$),
- It can be concluded that there is an insignificant but moderate relationship ($r=.658$; $p<.05$) between the positive thinking scale and mental toughness scale test scores.

6 Conflict of Interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

7 Author Contributions

Conceptualization, V.T. ; methodology, V.T.; software, V.T.; validation, V.T.; formal analysis, V.T.; investigation, V.T.; resources, V.T.; data curation, V.T.; writing—original draft preparation, V.T.; writing—review and editing, V.T.; visualization, V.T.; supervision, V.T.; project administration, V.T.; Author has read and agreed to the published version of the manuscript.

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