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Effects of Limb Girdle Disease on the Anatomical Functional Areas of the Shoulder Girdle and Pelvic Girdle Muscles

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Abstract

Our aim in this study is to determine the muscle's destruction in the functional area of the shoulder girdle and the functional area of the pelvic belt. To guide these individuals to continue their lives in comfort by observing the functional areas of the shoulder and pelvic groups of the individual and by programming the appropriate sport activities. It is essential to learn the functional anatomy of the muscles in the areas affected by the limb girdle disease. Therefore, the researchers contributed valuable knowledge of the functional anatomy of the muscles of the shoulder and pelvic girdle.

A significant difference is observed between the averages of Cervical Flexion Force 1 and Cervical Flexion Force 2 (P = 0.000). While the distribution of Cervical Flexion Force 1 data is close to normal, the distribution of Cervical Flexion Force 2 data is piled on the left. In addition, there is a relationship of r=0.747 between Cervical Flexion Force 1 and Cervical Flexion Force 2, P=0.00. There is a significant difference between the means of Cervical extension force 1 and Cervical extension force 2, (P=0.000). In addition, there is a relationship of r=0.546 between Cervical Force 1 and Cervical Force 2 and it is significant, (P=0.00). A significant difference was observed between the mean of Truncus extension Force 1 and Truncus extension Force 2 (P=0.001).

It occurs with muscle weakness in the shoulder and pelvic function areas during youth. Muscles lose their strength in direct proportion to the age of the patient. We believe that strengthening the muscles under the shoulder and pelvic functional areas will enable these patients to independently maintain their daily needs.

Keywords
Limb girdle; Shoulder girdle; Pelvic girdle; Muscules anatomy; Functional anatomy; Rehabilitation; Neuropsychological examination; Neurological diseases

Introduction
Limb-girdle is reported by researchers as a progressive heterogeneous disease with the loss of muscles in the functional areas of the shoulder and pelvic girdle. Limb-girdle occurs in the childhood or pre-adult stage. It is a disease that can be seen in both sexes. It causes the muscles in the functional areas of the shoulder girdle and pelvic girdle as well as the muscles that can cause serious damage on the hand-arm, leg and waist bones to shrink and become weak. It causes restrictions in movements due to weakening muscles [1].

It has been reported by researchers that muscle dystrophy R2 (LGMDR2), which occurs in the functional areas of the shoulder and hip girdle connecting the upper and lower limbs to the axial skeleton, is caused by inherited muscular dystrophies DYSF gene mutations [2]. In muscular dystrophies, it has been suggested in recent studies that genetic mutations prevent the production of muscle proteins needed to build and maintain healthy muscles [2], (Table 1). It is essential to learn the functional anatomy of the muscles in the areas affected by the limb- girdle disease. Therefore, the researchers contributed valuable knowledge of the functional anatomy of the muscles of the shoulder and pelvic girdle (3,4), (Figure 2). Muscules of Shoulder girdle: Musculus deltoideus is divided into three parts: the clavicular part-pars clavicularis, the acromial part-pars acromialis, and the spinal part-pars spinalis.

The clavicular part arises from extremitas acromialis claviculae, the acromial part arises from acromion, the spinal part arises from spina scapulae. All three parts are inserted on tuberositas deltoidea. The three parts of the muscle alone or in different combinations act as synergists or antagonists. The clavicular part produces rotatio interna brachii, the acromial part produces abductio brachii, the spinal part produces rotation externa brachii, the clavicular and acromial parts produce flexio brachii, the acromial and spinal parts produce extension brachii, the clavicular and spinal parts produce adductio brachii.

1. **Musculus supraspinatus:** Starts from fossa supraspinata and is inserted on tuberculum majus humeri; the muscle produces abductio brachii.

2. **Musculus infraspinatus:** Arises from fossa infraspinata and is inserted on tuberculum majus humeri; the muscle produces rotatio externa brachii.

3. **Musculus teres minor:** Arises from margo lateralis scapulae and is inserted on tuberculum majus humeri; the muscle produces rotatio externa et extensio brachii.

4. **Musculus teres major:** Starts from margo lateralis scapulae and is attached below tuberculum minus humeri; functions of the muscle are adductio, rotatio interna et extensio brachii.

5. **Musculus subscapularis:** Starts from fossa subscapularis and is attached to tuberculum minus humeri; the muscle produces adductio et rotatio interna brachii.

   Muscules of Pelvic Girdle: Anterior pelvic muscles.

6. **Musculus iliopsoas** has two parts: Musculus iliacus: Arises from the iliac fossa and musculus psoas major-arises from the lateral parts of the lumbar vertebrae; the muscle leaves the pelvic cavity via lacuna musculorum (space below the inguinal ligament) and is inserted on lesser trochanter of the femur. The muscle acts on the hip joint-flexio et rotatio externa femoris and also on the zygapophysial joints-flexio trunci.

7. **Musculus psoas minor:** Is a small muscle what lies medially to the previous, it arises from lateral parts of the last thoracic and the first lumbar vertebrae, is inserted on the iliopubic eminence; it moves the zygapophysial joints- flexio trunci.

   Posterior Pelvic Muscles

8. **Musculus gluteus maximus**: Arises from posterior part of the gluteal surface and dorsal surface of the sacral bone, it is inserted on the gluteal tuberosity. The muscle produces movements in the hip joint: extensio et rotatio externa femoris.

9. **Musculus gluteus medius:** Arises from the middle part of the gluteal surface and is inserted on the greater trochanter of the femur. The muscle produces abductio femoris in the hip joint; it

also produces rotatio interna femoris (contractions of anterior fibres) or rotatio externa femoris (contractions of posterior fibres).

10. **Musculus gluteus minimus:** Arises from the anterior part of the gluteal surface and is inserted on the greater trochanter of the femur. The muscle produces abductio femoris in the hip joint; it also produces rotatio interna femoris (contractions of anterior fibres) or rotatio externa femoris (contractions of posterior fibres).

11. **Musculus tensor fasciae:** Latae arises from spina iliaca anterior superior and is inserted into the iliotibial tract (thickening of the fascia lata). The muscle tenses the fascia lata and produces flexio femoris in the hip joint.

12. **Musculus piriformis:** Arises from the pelvic surface of the sacral bone, leaves the pelvic cavity through foramen ischiadicum majus and is inserted on the greater trochanter of the femur. The muscle produces abductio et rotatio externa femoris.

13. **Musculus obturatorius internus:** Arises from inner surface of the obturator membrane, leaves the pelvic cavity through foramen ischiadicum minus and is inserted near the greater trochanter of the femur. The muscle produces rotatio externa femoris.

14. **The two gemelli muscles:** Musculus gemellus superior, Musculus gemellus inferior lie above and below the obturator internus muscle. The upper one arises from spina ischiadica, the lower one-from tuber ischiadicum; both muscles are inserted near the greater trochanter of the femur and produce rotatio externa femoris.

15. **Musculus quadratus femoris:** Arises from tuber ischiadicum and is inserted on the intertrochanteric crest of the femur; the muscle produces rotatio externa femoris.

16. **Musculus obturatorius externus:** Arises from outer surface of the obturator membrane; it lies deep and is covered by muscles of the medial compartment of the thigh. The muscle is attached near the greater trochanter of the femur and produces rotatio externa femoris.

Researchers report that falls occur due to muscle pain and stiffness, difficulty running and jumping, walking on the toes, difficulty sitting, climbing stairs or standing. It is stated by the researchers that the coordination of the bilateral muscles simultaneously is lost. Muscle wasting cannot be detected by the observation method, as fat replaces the melting muscles. Researchers who claim that there is no medical treatment state, only some sports activities can slow down the functional negative progression of the shoulder and pelvic girdle muscles [3]. Mobility in the pelvic girdle functional area is one of the most important components of a normal gait, lateral pelvic girdle inclination and rotation. By combining the upper and lower limbs with the trunk, it allows the trunk mobility simultaneously to separate between the shoulder and pelvic girdles increases balance, increases joint mobility and decreases the energy required for walking [3-9].

It is the body area located in the functional area of the pelvic girdle, between the perineum muscles,

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external genitalia and the anus. It hosts the muscles that control urine and fecal functions in the perineum part of this region. Extends the pelvic joint; that is, it makes the limb straight when it is bent. Although it is the strongest muscle that makes this movement, it is generally used in movements that require force such as standing up while sitting and climbing stairs. It is not used at all when standing and is rarely used when walking on straight roads, so its paralysis does not make much of a difference to straight road walking. It also performs external (lateral) rotation in the pelvic, that is, the movement of bending the limb outward. Due to its attachment to the iliotibial band, it tightens the hip and knee joints by pulling the band. Since the iliotibial band is connected to the anterolateral protrusion of the tibian, this function that it can perform with the tensor fasciae latae does not require it to perform while standing normally. Since the iliotibial band is connected to the femur via the lateral intermuscular septum, the knee cannot be moved [4,5] (Table 1).

The muscles in the functional area of the shoulder girdle contribute to pulling and lift movements. Under the influence of the functional area of the shoulder girdle, the forearm muscles hold, stretch and work. The muscles under the influence of the pelvic belt functional area work with the support of the muscles that affect the knee joint and ankle joints by squatting on the floor, standing up from the ground and walking. Different researchers; In LGMD disease; They report having a difficult life in the psychological and neuropsychological, physical, mental and social areas [22,23]. Our aim in this study; It is to determine which muscles in the functional area of the shoulder girdle and the functional area of the pelvic belt undergo muscle destruction. It is to guide these individuals to continue their lives in comfort by observing the functional areas of the shoulder and pelvic groups of the individual and by programming the appropriate sports activities.

Material and Methods

Our study was conducted on patients who were diagnosed with limb girdle muscular dystrophy who came to the Health Sciences University, Diyarbakir Gazi Yaşargil Training and Research Hospital, Department of Physical Therapy, Rehabilitation and Neuromuscular. Our study was approved by the Ethics Committee of the Health Sciences University Diyarbakir Gazi Yaşargil Training and Research Hospital in the Ethics Committee serial no: 808 2.7.2021 session. We studied the variables from the muscle subunit (limb girdle muscular dystrophy). The sample size consists of datas from n=73 patients. The variables we use are as follows. The variables of age at diagnosis, age of complaint, first complaint, height, weight Body Mass Index. The descriptive statistics of the variables we are interested in are given in the descriptive statistics together with the min, max; mean and standard deviation in the first (inter quartile) 25% and 75 % for the last quarter. Ranges of values are given. As a statistical solution method; we calculated the correlations between variables and tested the statistics found. Pearson's r correlation coefficients were also analyzed with Student's t test. Kruskal-Wallis ANOVA was applied to test the difference between the group averages according to the Education level variable and the Location of Diagnosis variables. According to the gender and according to the condition of the disease; Student's t test was used to analyze the difference between the means of the determined variables. The test results found to be significant were marked as *for Type I error $\alpha=0.05$, and **for $\alpha=0.05$.

Muscle Strength Grading Scale

The Oxford Scale is a quick method of assessing and grading muscle power. A detailed knowledge of muscle anatomy is required to carry out an assessment appropriately. The Oxford Scale is a 0-5 scale which is then recorded as 0/5 or 2/5, sometimes with a + or - sign to indicate more or less power but not sufficient to reduce or increase the number. The anatomist should bring the individual to the proper posture for accurate assessment and to allow good visualization and palpation of anatomical structures.

Scale	The evaluation of the oxford scale
0/5	No shrinkage
1/5	There is visible / palpable muscle contraction but no movement
2/5	Motion disappeared with gravity
3/5	Movement against gravity only
4/5	Movement against gravity with a resistance
5/5	Movement against gravity with full resistance

Table 1: Grading for the evaluation of the oxford scale.

Medical Research Council Muscle Rating System, FAS scale, and BARTHEL Scale were applied to these patients. LGMD disease, anyway? This disease is genetically congenital and occurs at early or young ages with proximal muscle weakness involvement called the shoulder and hip circumference. It is a muscle disease related to the loss of independent walking and independent daily life strength in the progressive process and muscle strength loss increases with age. This disease is of genetic origin and has familial inheritance. The patient's history in making the diagnosis; physical and neurological examination, blood tests, especially high creatine kinase enzyme is expected in these patients. EMG, muscle biopsy within the needs and possibilities and ultimately definitive diagnosis are made with genetic results. The records of the genetic results of all patients included in the study for definitive diagnosis are in our archive.

Statistical Analysis

Statistics were given for the ratios or averages relevant to the variables we examined. Results are presented as mean ± standard deviation. For the two groups; Student t test was used for the significance of the differences between the averages, the One Way ANOVA (Bonferroni) test was used in multiple groups, and the Chi-Square (Fisher's exact) test was used for the analysis of categorical variables. Correlations between measurements were analyzed using Pearson's correlation analysis. When there were few variables, Spearman r coefficients were used. A value of $p < 0.05$ was considered statistically significant for the tests used.

Result

A total of 73 consecutive cases, 44 males and 29 females, with an average age of 33.5 ± 11.7 years, who applied between 2010 and 2021, were included in the study. Lower extremity muscle groups of the cases were measured and comparisons were made according to age groups and gender.

<table>
<tr><td colspan="2" rowspan="2">-</td><td colspan="2">Current Complaints</td><td rowspan="2">Total</td><td rowspan="3">Probability (now)</td></tr>
<tr><td>General Weakness</td><td>Inability to walk</td></tr>
<tr><td rowspan="2">First Complaint</td><td>General Weakness</td><td>38</td><td>20</td><td>58</td></tr>
<tr><td>Inability to walk</td><td>4</td><td>9</td><td>13</td><td rowspan="2">18%</td></tr>
<tr><td colspan="2">Total</td><td>42</td><td>29</td><td>71</td></tr>
<tr><td colspan="3">Probability (First)</td><td colspan="3">40.80%</td></tr>
</table>

Table 2: First Complaint *Crossed Current Complaints.
Chi-Square=5.37, P=0.02, Kappa=0.235, P=0.02.

Of these, 13 subjects (18%) were unable to walk at the first complaint. In his current complaints, "inability to walk"; There are 29 (40.8%) subjects in total (Table 1). The similarity according to the Kappa coefficient is 23.5%. There is a significant difference between the first state and the present state (P=0.02).

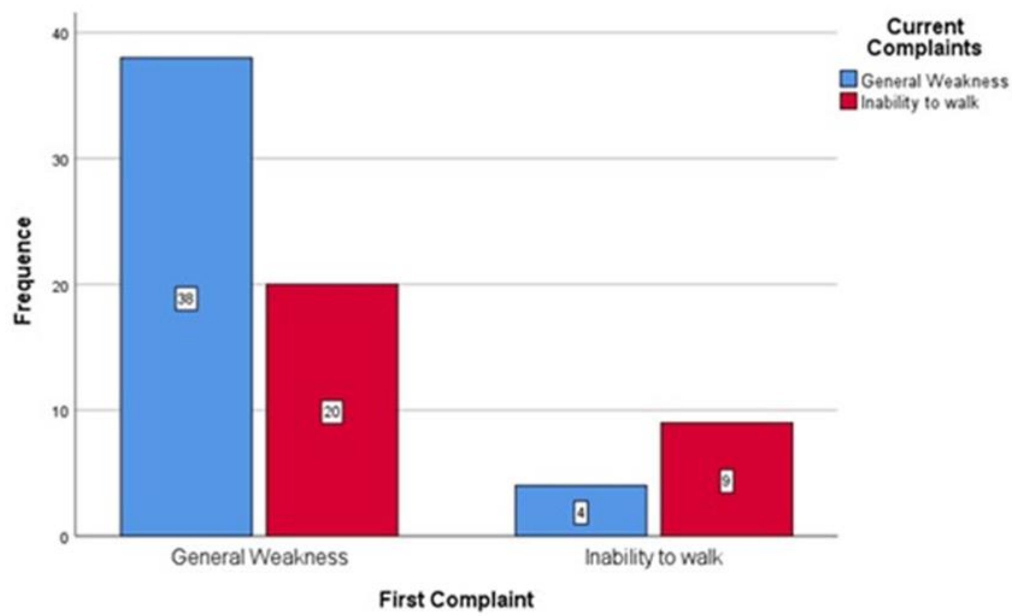

Figure 1: Bar graph presentation of the distribution of the first complaint according to the current complains.

When we examine the bar graphs of the subjects applied to our clinic; while the frequency bar belonging to the people with general weakness complaint was 38 in the first complaint, the frequency bar for the

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general weakness complaint dropped to 4 in the current complaint. It was determined that the frequency bar of the people with complaints of inability to walk at the first complaint was 20, while the frequency bar for the complaint of inability to walk in the current complaint fell to 9, (Table 2). According to the walking status of 71 limb-grid patients who came to our clinic, the mean and standard deviation measurements of the age variable at which they were diagnosed were given. A significant difference was found between the averages of the distributed groups according to walking status categories (Table 2).

Walking status						
-		**N**	**Mean**	**Standard Deviation**	**Standard Error Mean**	**Student's t**
Age at Diagnosis	**Walking**	44	25.6818	10.70052	1.61316	t=-2.078 P=0.04
	Not walking	27	31.5556	12.8582	2.47456	

Table 2: Group statistics.

A significant difference is observed between the averages of Cervical Flexion Force 1 and Cervical Flexion Force 2 (P=0.000). While the distribution of Cervical Flexion Force 1 data is close to normal, the distribution of Cervical Flexion Force 2 data is piled on the left. In addition, there is a relationship of r=0.747 between Cervical Flexion Force1 and Cervical Flexion Force 2 (Table 3, Table 4), P=0.00 (Figure 2, Figure 3).

	Mean	**N**	**Standard Deviation**	**Standard Error Mean**	**Student's t**
Cervical flexion force 1	3.7347	49	0.78463	0.11209	t=4.974, P=0.00 S

Table 3: Paired Samples Statistics.

-	Mean	N	Standard Deviation	Standard Error Mean	Student's t
Cervical Extension Force 1	4.3469	49	0.75142	0.10735	t=4.619 P=0.00 S
Cervical Extension Force 2	3.7755	49	1.00551	0.14364	-

Table 4: Paired samples statistics.

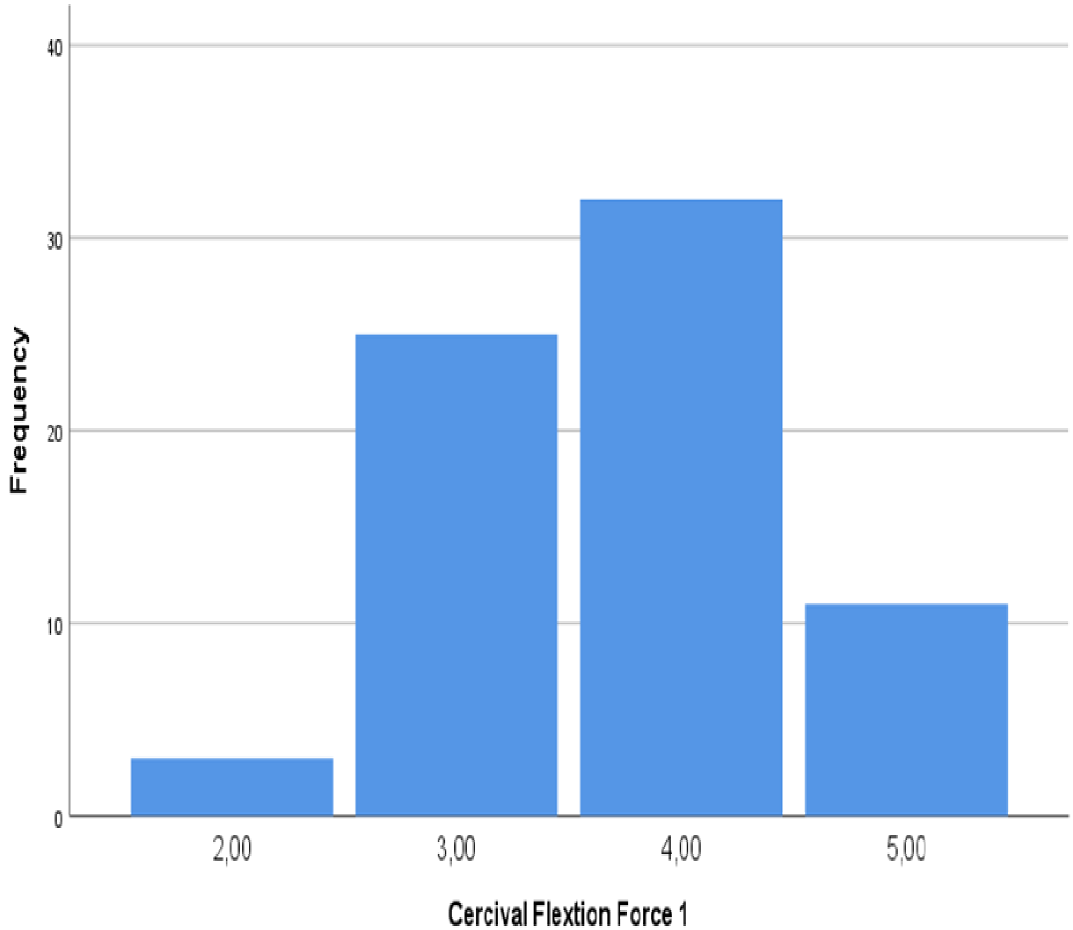

Figure 2: Cervical Flexion force 1.

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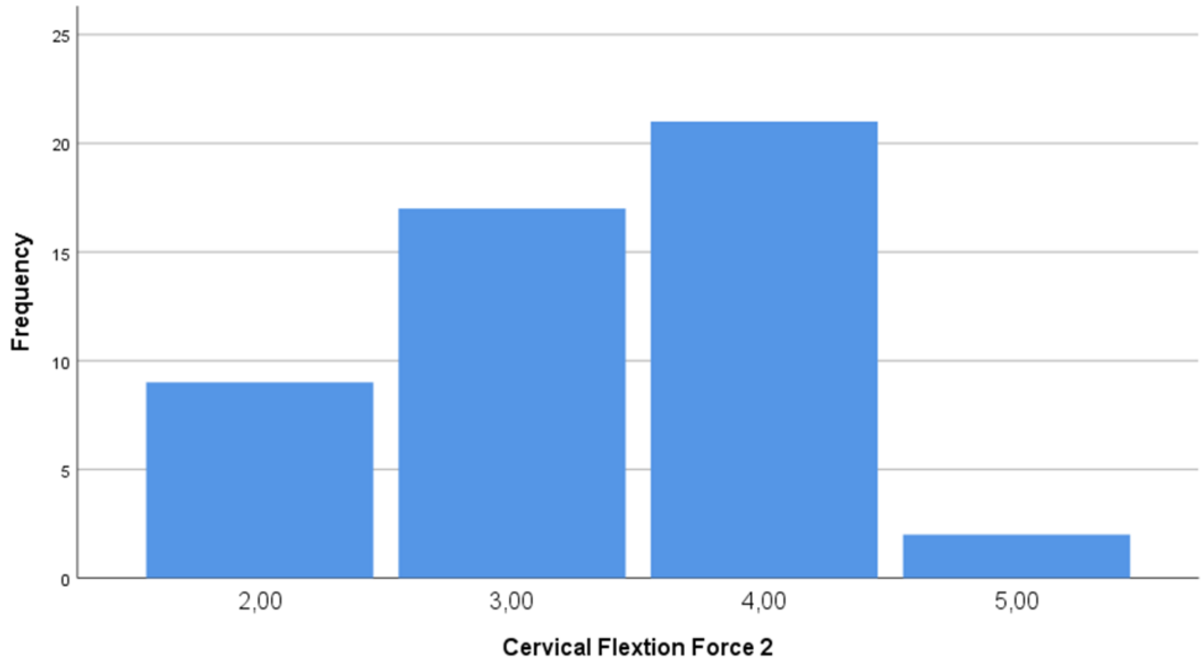

Figure 3: Cervical Flexion force 2.

Note: In Figure 2 and 3, the data on the right are oriented towards the center.

There is a significant difference between the means of Cervical Extension force 1 and Cervical Extension force 2 (P=0.000). While the distribution of Cervical Extension force 1 data is skewed to the left, the distribution of Cervical Extension force 2 data has approached to normal. In addition, there is a relationship of r=0.546 between Cervical Force1 and Cervical Force 2 and it is significant (Table 4) (P=0.00). The small measurements on the left in Figure 4 have shifted towards the center in Figure 5.

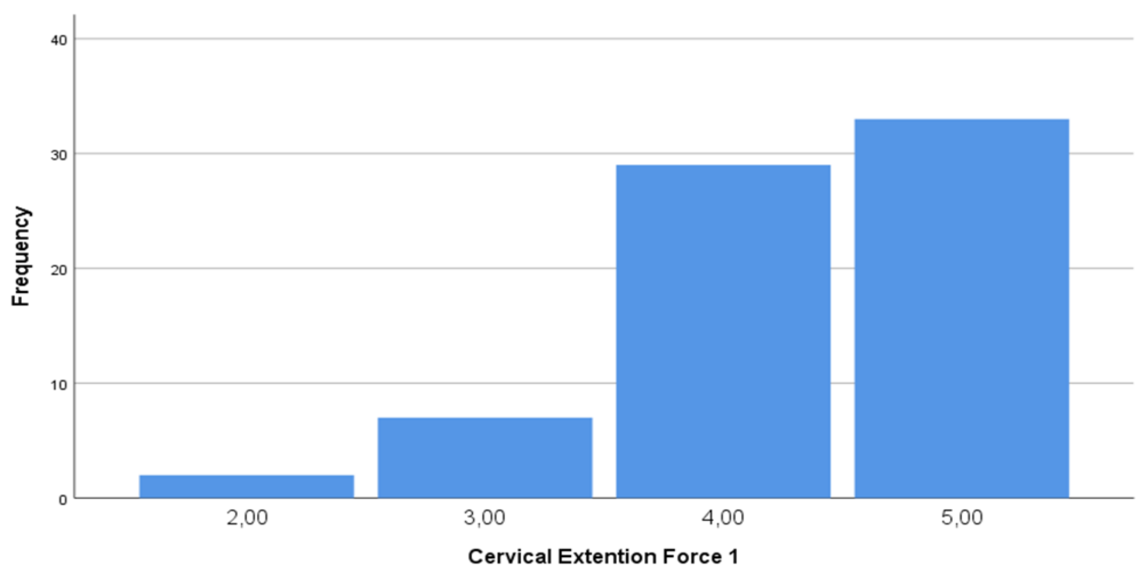

Figure 4: Cervical Extention force 1.

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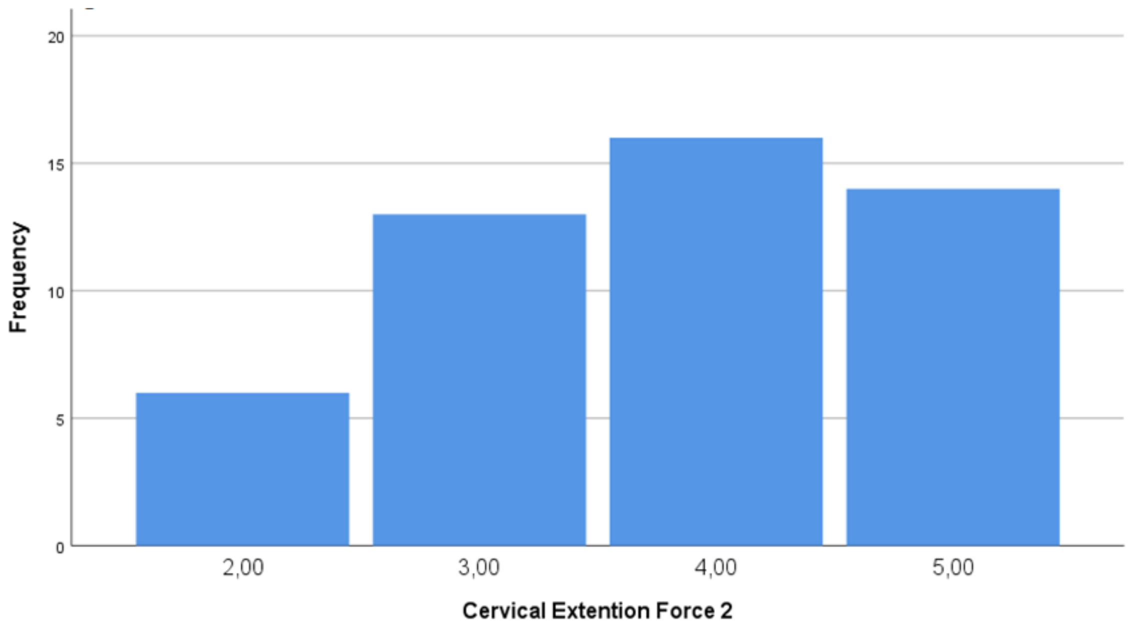

Figure 5: Cervical Extention force 2.

Mean measurement in Truncus Flexion force 1 and Truncus Flexion Force 2, which is repeated measurement, decreased on average. A significant difference was found between repeated measurements (P=0.0001), (Table 5).

-	Mean	N	Standard Deviation	Standard Error Mean	Student's t
Truncus Flexion Force 1	3.3469	49	0.90257	0.12894	t=6.03, P=0.000 S
Truncus Flexion Force 2	2.8163	49	1.03428	0.14775	

Table 5: Paired samples statistics (Truncus Flexion Force 1 and Truncus Flexion Force 2).

While in Figure 6 the measurements were stacked on the third histogram, in, Figure 7 the measurements to the right were obtained with diffuseness. A significant difference was observed between the mean of Truncus Extension Force 1 and Truncus Extension Force 2 (P=0.001). While the distribution of the Truncus Extension Force 1 data was skewed to the left, the distribution of the Truncus Extension Force 2 data is approached to normal. In addition, there is a relationship of r=0.766 between Trunk Extension Force 1 and Truncus Extension Force 2 (Table 6) (P=0.00).

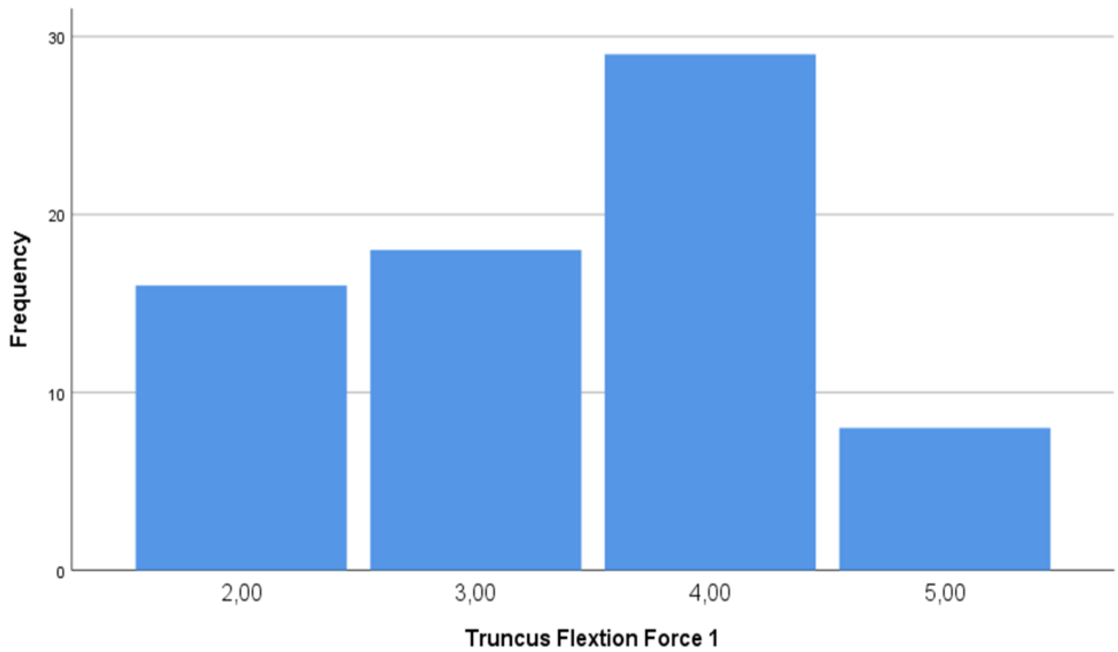

Figure 6: Truncus Flextion force 1.
Note: The measurements to the right were obtained with diffuseness.

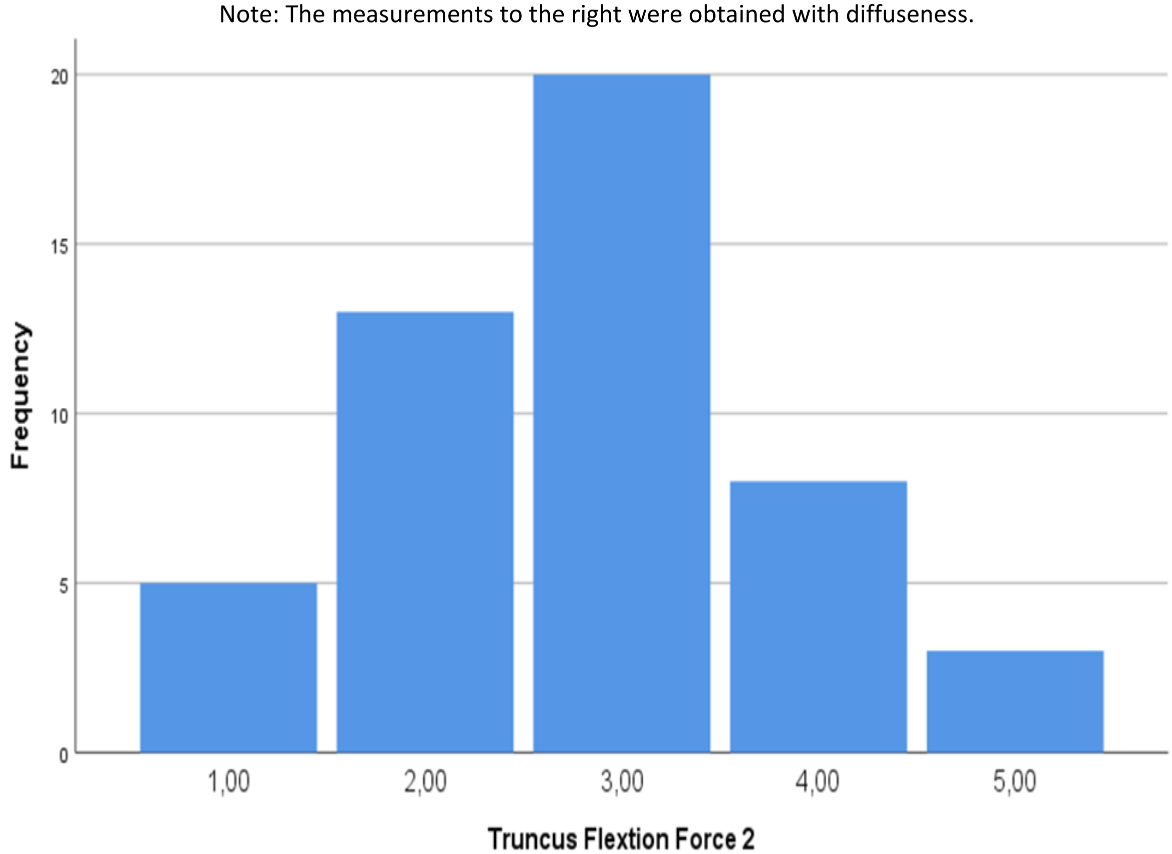

Figure 7: Truncus Flextion force 2.

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-	Mean	N	Standard Deviation	Standard Error Mean	Student's t
Truncus Extention Force 1	3.2857	49	0.91287	0.13041	t=3.50 P=0.001 S
Truncus Extention Force 2	2.9388	49	1.06865	o.15266	

Table 6: Paired Samples Statistics.

The measurements in Figure 8 have shifted towards the mean in Figure 9. Descriptive statistics regarding the variables we used in our study were presented in Table 7 and Figure 10.

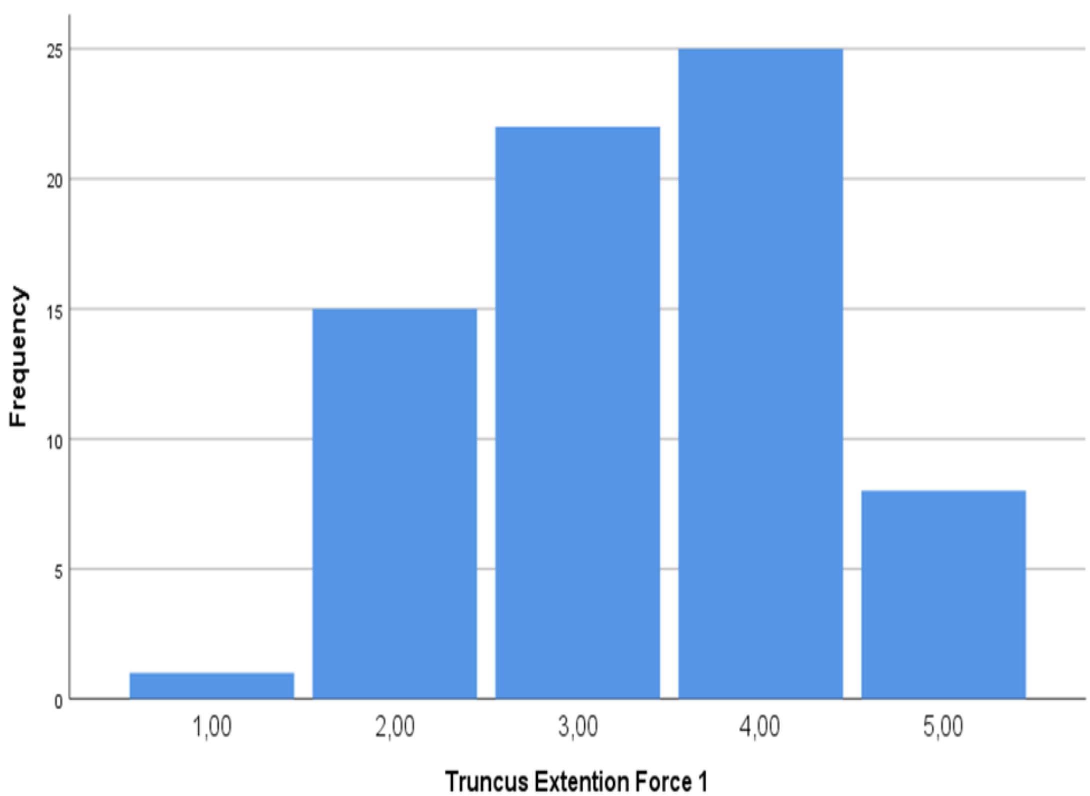

Figure 8: Truncus Extension force 1.

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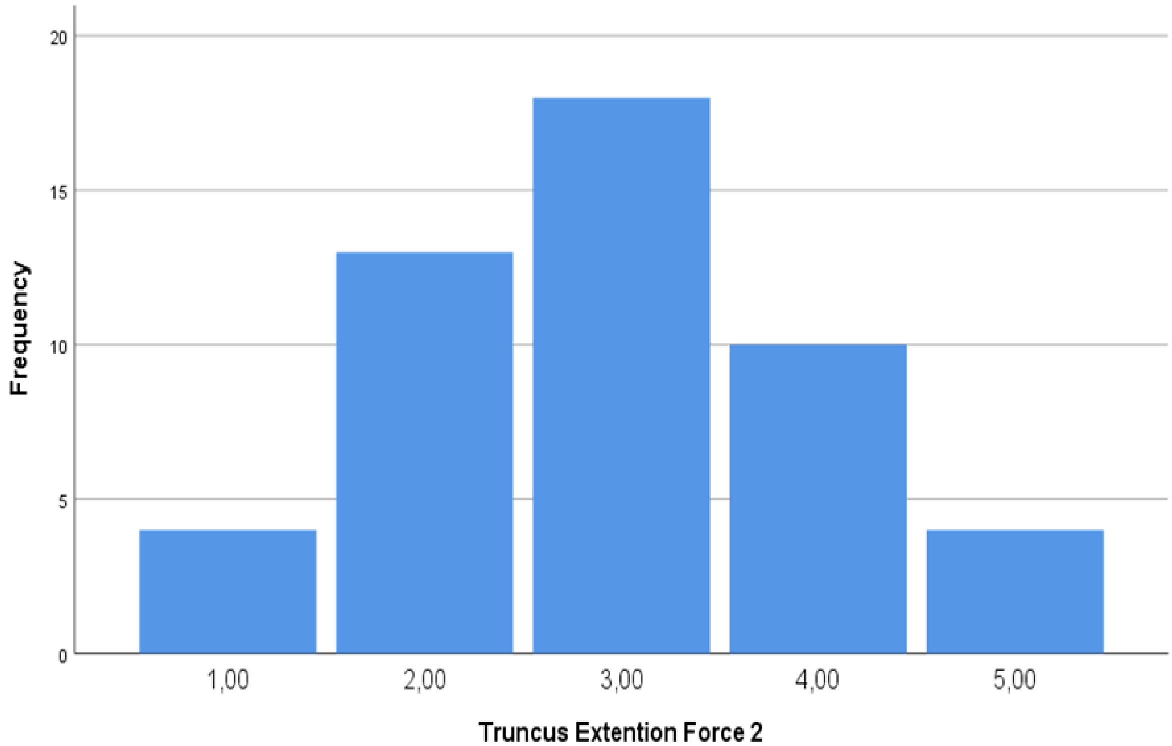

Figure 9: Truncus Extension force 2.

-	N	Mean	Standard Deviation
Cervical Extension Force1	71	4.3099	0.76703
Cervical Extension Force 2	49	3.7755	1.005
Truncus Flexion Force 1	71	3.4085	0.96477
Truncus Flexion Force 2	49	2.8163	1.03428
Truncus Extension Force 1	71	3.338	0.98479
Truncus Extension Force 2	49	2.9388	1.06865
Shoulder Force1	71	3.0704	1.11258
Shoulder Force 2	50	2.36	1.10213
Elbow force 1	71	3.507	1.06735
Elbow force 2	50	3.54	2.85149
Elbow Joint Range of Motion1	71	1.1268	0.33507
Hand Wrist force 1	71	3.9577	0.90137
Hand Wrist force 2	50	3.8	0.85714

Pelvic Girdle Force1	71	2.7887	1.1822
Pelvic Girdle Force 2	52	2.3462	1.1356
Knee Force1	71	3.2254	1.19758
Knee Force 2	49	2.8776	1.21848
Ankle Force 1	71	3.3662	1.24487
Ankle Force 2	49	2.9388	1.23167
Knee Joint Range of Motion 1	71	1.0845	0.28013
Ankle Joint Range of Motion 1	71	1.1268	0.33507
Cihaz	71	1.8028	0.4007
Walker	71	1.9014	0.30023
FAS1	71	2.8592	2.13338
FAS2	50	2.18	1.95553
AFO_FAS2	14	3.7143	1.13873

Table 7: Descriptive Statistics.

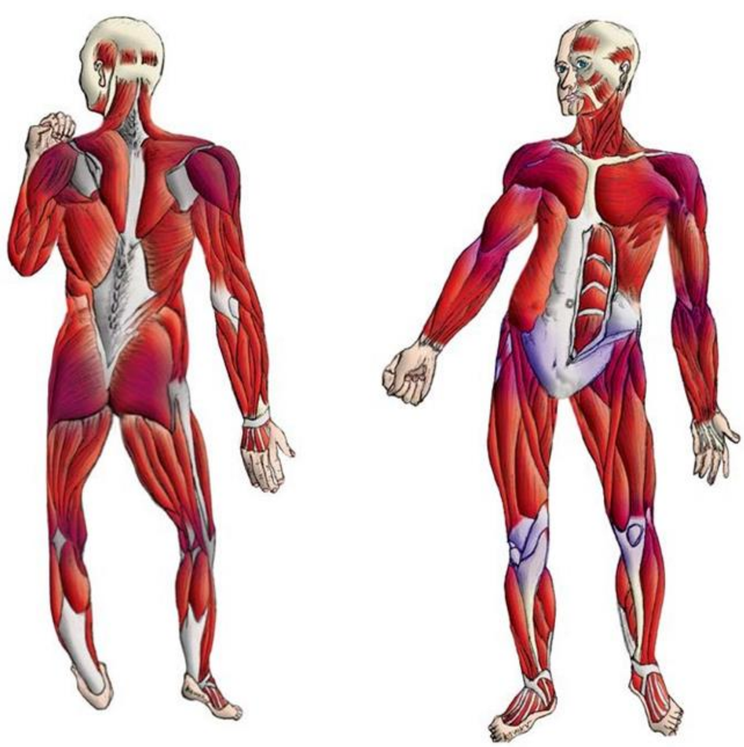

Figure 10: Limb Girdle; Muscular anatomy.

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Discussion

The proportion of subjects who applied to our clinic with Limb-Girdle complaints significantly increased in their subsequent controls (Table 1). It supports the importance of the research that suggests directing the subjects, which is the aim of our study. To appropriate sports activities. Researchers; they stated that joint. Muscle and neurological diseases cause loss of mobility in the shoulder and hip girdles. They state that repetitive movements in the joints in the form of a set will contribute to the improvement of the separation of the shoulder-pelvic girdle joints. The results of our study support the studies of these researchers [6-9]. We observed that the rates of the subjects who complained of general muscle weakness and inability to walk decreased when they came for control after home exercise programs (Figure 2). Our findings of general weakness and inability to walk in our study support the findings of other researchers [7-9]. When the findings of Cervical Flexion force 1 and Cervical Flexion force 2 of the subjects were examined. We determined that a large proportion of the subjects were collected cumulatively in the 3rd and 4th scales (Table 3).

We determined that the results of our study support the findings of other investigators [10,11]. In the light of the examination of our findings of Cervical Extension forces that are under the effect of the functional area of the shoulder girdle. Most of the subjects were examined in the 4th and 5th. Weobserved that it was collected cumulatively in scales. Also, we found that its mean values decreased (Table 4).

From the results of our findings it is seen that the subjects did not comply with the recommended home exercise program. We believe that exercise programs can only be carried out under the management of experienced anatomists in equipped sports and exercise halls to be opened by the state with the awareness of being a social state. When the average values of Truncus Flexion Force 1 and 2 were examined, it is seen that the subjects do not comply with the exercise program because the average value is low (Table 5). The results of these values support the justification of the purpose of our study [10,11]. When the average values of Truncus Extension Force 1 and Truncus Extension Force 2 were examined, it is seen that the subjects do not comply with the exercise program because the average value is low (Table 6).

The results of these values show the justification of the purpose of our study and are consistent with the results of other researchers [10,11]. When the values that affect the shoulder girdle functional area are examined; We found that there was a decrease in the averages of our values (Table 7). Likewise, when we examined our values that have the effect of pelvic belt functional area; it is seen that there is a decrease in the averages of our values (Table 7). Our emphasis of the findings strongly supports the results of other researchers [10,11].

The combination of in vitro and in-silico data the researchers declare supports the hypothesis that LGMD D2 is likely caused by a variety of possible mechanisms including nuclear transport and myofibrillar network. And report the need for additional studies such as cellular functionality. In order to create comfort in the life of the patient, this is the aim of our study. The studies on the muscles in the shoulder and pelvic belt should be insistently carried out under the supervision of an anatomist in sports centers to be opened by the state [12-14].

Characteristics by researchers increased slow fiber size and improved exercise performance. AMBMP also reports that CaMKIIb is enabled. However, they say that signaling does not alter other pathways known to be associated with muscle growth. For this reason, researchers emphasize both the development of treatment methods and the application of intensive exercise programs. Intense exercise programs underthe supervision of the anatomist. This we emphasized in our study and the results of these researchers are in parallel with our emphasis [15]. Researchers have stated that different genetic mutations underlying different pathogenic mechanisms are the cause of muscle fiber degeneration and loss of strength in limb- girdle muscular dystrophies (LGMD). Majority researchers; People with LGMD have a sedentary lifestyle due to loss of muscle fibers or motor impairment. Researchers have been debating for many years whether muscle exercise is beneficial or harmful for subjects with myopathic disorders. Researchers; they think that muscle exercise helps prevent loss of muscle tissue and strength. Researchers state that the muscular structural defects in LGMD can cause sarcoma imbalance. These statements also emphasize that it can increase the likelihood of muscle damage as a result ofintense muscle contraction. Such as during eccentric training, some researchers suggest that anatomist- controlled aerobic exercise training is safe and may be effective in improving oxidative capacity and muscle function in subjects. Researchers state that resistance training for muscle function should be considered as part of a rehabilitation program for patients with limb-girdle muscular dystrophy. However, the researchers insist on being strictly supervised by an experienced anatomist to prevent the development of possible muscle damage.

Some researchers say that the repetitive activity of skeletal muscle causes various changes in its properties with the intense use of the muscles. The muscles become weaker. They state that it is painful after repeated contractions that involve stretching. They state that muscle fatigue is caused by an accumulation of lactic acid that produces an intracellular acidosis that inhibits myofibrillar proteins. They say muscles can be used to shorten and produce strength. Or they can be used to reduce loads. They state that the day after intense exercise. Which involves strained contractions, the muscles may be weak, painful and sensitive. Therefore, our emphasis in the research is that subjects should be exposed to exercise under the supervision of an anatomist with repetitive sets to meet their daily needs [16-21]. Researchers; they suggest that a crucial factor in improving the quality of life of LGMD patients will be psychotherapy and neuropsychological rehabilitation using neurotechnology. Recommended by researchers; To improve the quality of life of LGMD patients; We believe that psychotherapy and neuropsychological rehabilitation using neurotechnology will open a new phase in the future of our work [21].

LGMD disease; it is genetically a congenital disease. It occurs with muscle weakness in the shoulder and pelvic function areas during youth. Muscles lose their strength in direct proportionto the age of the patient. In the future, the patient continues walking and daily life activities with the help of someone else. This genetic disease can be passed on to other members of the family. Due to the socio-economic and educational status of their family members, they cannot get enough information with these patients. For this reason, the disease tables of these patients worsen in the later stages. The treatment of these patients; It should be the responsibility of the social state institutions that have to provide treatment to their citizens. The right of the citizen to a high standard of physical and mental health is protected by international law. The treatment that the state is obliged to provide to its citizens is a fundamental human right. Exercise programs of these patients; with the organization of the state and under the supervision of fully equipped experienced anatomists. This will be opened next to the hospitals. The program in the form of a repetitive set for the muscles in the functional areas of the shoulder and pelvic should be carried on tirelessly and stubbornly. We believe that strengthening the muscles under the shoulder and pelvic functional areas will enable these patients to independently maintain their daily needs.

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