A Phenomenological Research on Preparatory Physical Exercises in Music Education[1]

Gül SAKARYA
Trakya University, Faculty of Education, Fine Arts Education Department, Edirne-Turkey
gulsakarya@trakya.edu.tr,
ORCID: 0000-0002-2377-176X

Figen GİRGİN
Trakya University, Faculty of Education, Fine Arts Education Department, Edirne-Turkey
figengirgin@trakya.edu.tr,
ORCID: 0000-0002-5747-6769

Onur ZAHAL
Inonu University, Faculty of Education, Fine Arts Education Department, Malatya-Turkey
onur.zahal@inonu.edu.tr,
ORCID: 0000-0003-0702-9159

Osman MUSAOĞLU
Trakya University, Faculty of Education, Fine Arts Education Department, Edirne-Turkey
osmanmusaoglu@trakya.edu.tr,
ORCID: 0000-0002-1797-9206

ABSTRACT
Musicians who play instruments may suffer from some musculoskeletal disorders due to intense and long working processes, wrong posture-holding, insufficient bodily awareness. Preparatory physical exercises can be used to prevent or alleviate these disorders. These are aimed at warming up, opening-stretching, strengthening the joints and muscles and maintaining the correct posture in order to prepare the body for playing. In this study, it was aimed to reveal the pre-service music teacher candidates' physical exercises for instrument practice. A qualitative method was used in the research; a semi-structured interview form was applied to the study group. In the analysis of the data, the thematic analysis technique was used. As a result of the analysis, 4 main themes including “exercise experience”, “breath awareness”, “physical pains” and “effects of exercise” and 9 sub-themes and 49 codes depending on these themes were revealed. As a result of the research, it was concluded that music teacher candidates did not do regular exercise work for instrument study, they experienced physical pain due to instrument study, their breath awareness was not at a sufficient level, and exercise had physical and psychological effects on instrument performance. In addition to medical treatments for musician injuries related to instrument playing, physical awareness and exercise training that prevent these disorders play an extremely important role. In instrument education, besides technical and musical concepts, it is necessary to research and apply ways to bring physical awareness to students.
Keywords: Music Education, Preparatory Physical Exercises, Musician Disorders, Breath Awareness, Posture.

INTRODUCTION
Instrument performance, which is carried out in a human-instrument-body relationship, requires a high level of focus, work, physical and mental endurance (Cüceoğlu, 2008). Musicians, just like athletes, go through intensive preparation and work processes to perform well (Heinan, 2008; Yağışan, 2002; Elbaum, 1986; Akçay & Duzak, 2021; Norris, 1997; Çimen, 2003). Despite the similarity between them, musicians, unlike athletes, are exposed to long-term microtrauma due to activities aimed at developing fine motor skills (Elbaum, 1986). Intensive work processes can cause some physical injuries in musicians. Disorders that occur due to playing an instrument include work related upper extremity disorders, overuse syndrome, misuse syndrome, RSI- repetitive strain/stres injuries (Çimen, 2003). Musculoskeletal problems such as entrapment neuropathies, hand cramps, spinal disorders are among these disorders (Joubrel et al., 2001). Each instrument has its own risk factors (Brandfonbrener, 1990). Symptoms that accompany overuse syndrome include squeezing, stiffness, cramping, fatigue, swelling, and numbness (Lederman, 2003; Johnson, 2009; Potter & Jones, 1995). Although dystonia seems to be the most common movement disorder among musicians, other movement disorders such as tremors, tics, parkinsonism, apraxia and motor control disorders can negatively affect musicians' performance and threaten their careers (Jankovic & Ashoori, 2008). Among instrumentalists, pain is the most common symptom leading to medical consultation (Lederman, 2003; Johnson, 2009).

[1] This study was prepared with the approval of Trakya University Social and Human Sciences Research Ethics Committee. This study presented in INTE (July 28-29,2022).

Table 1: Causes of physical injuries in musicians playing instruments[2]

Overuse	Wrong instrument selection	Performance anxiety
Overload	Quality of the instrument	Fierce competition
Playing for a long time	Playing with the wrong technique	The pressure to play perfect
Insufficient rest	Repetitive movements	Gender (being female)
Sudden changes in practice routine	Carrying the weight of the instrument for a long time	Teacher exchange
Incorrect posture	The technical difficulty of the repertoire	Instrument change
Insufficient physical condition		
Failure to treat previous injuries		
Disregard for warm-up/relaxation exercises		

Preparatory physical exercises can be used to prevent or alleviate these disorders. These exercises are aimed at warming the joints and muscles, stretching, strengthening and maintaining the correct posture in order to prepare the body for playing. Correcting posture and increasing conditioning are effective in preventing injuries due to playing an instrument (Frederickson, 2002; Lederman, 1994). However, correct posture-holding and technical issues can be handled in the early stages of instrument learning and put into the background with the effect of performance anxiety in the advanced stages (Frederickson, 2002). The concepts of strength, flexibility and endurance stand out as components of an ideal exercise process (Norris, 1997). Regular, repetitive and planned/programmed movements for purposes such as endurance, strength, flexibility, body composition and neuromotor conditioning are called exercise (Arslan, 2021). In order to prevent musician injuries, an exercise program for these issues should become a part of the instrument lesson (Yağışan, 2002; Kava et al., 2010; Frederickson, 2002). For the purpose of preventing overuse, it will be effective to notice the signs of fatigue and take measures for this, and to do sports such as walking and swimming in order to reduce the possibility of injury (Akçalı, 2006). Individuals who play instruments should be made aware of their bodies and have the habit of self-control (Gökbudak & Tutun, 2005; Özübek, 2019). For these purposes, techniques such as Alexander Technique, Pilates, Yoga, Tai Chi can be applied (Ostwal et al., 1994; Özübek, 2019; Fehm & Schmidt, 2006; Fishbein et al., 1988). It is important to review the playing technique and to take rest breaks in eliminating the injuries caused by excessive use (Johnson, 2009; Lederman, 1998; Ostwald et al., 1994; Özübek, 2019; Solomon, 2007; Lockwood, 1989). Avoiding excessive tension and repetitive movements, using as large muscle groups as possible, practicing without instruments are among the methods that can be applied (Solomon, 2007). In addition, a balanced diet, paying attention to water consumption (Ostwald et al., 1994; Solomon, 2007) pre-workout meditation, breathing exercises and mental repetitions to reduce stress will significantly prevent anxiety and help prevent injuries and discomfort (Akçalı, 2006). Zaza et al., (1998), the first study to investigate musculoskeletal disorders caused by playing an instrument, showed that these disorders are personal, chronic and disabling health problems that affect people physically, emotionally, professionally and socially.

Developments in sports medicine laid the foundations for the concept of performing arts medicine (Lederman, 2003). Performing Arts Medicine is a broad field that includes the study of medical conditions and injuries suffered by dancers, instrumental musicians (Bejjani et al., 1996). In addition to medical treatments, physical awareness and exercise training play an extremely important role in preventing these disorders in musician injuries related to playing an instrument. In instrument education, besides technical and musical concepts, it is necessary to research and apply ways to bring physical awareness to students.

Aim

The problem of this study is to reveal the opinions of pre-service music education teachers about preparatory physical exercises.

METHODS

Study Design

This study is based on the qualitative method. Phenomenology design, one of the qualitative research designs, was used in the study.

Participants

The participants consist of a total of 24 students, 13 female and 11 male, who are studying in the 4th grade of the Trakya University Education Faculty Fine Arts Education Department Music Education Department. Their main instruments are flutes (n=4), violins (n=4), pianos (n=5), cellos (n=2), guitars (n=3), clarinet (n=1) double bass (n=1) and voice (n=4). Ages range from 21 to 33.

[2]Table 1. created from Akçay & Duzak, 2021; Önder, 2021; Önder, 2013; Robinson & Zander, 2002; Norris, 1997; Lederman, 2003; Ostwald et al., 1994; Heinan, 2008; Kaufman-Cohen & Ratzon, 2011; Atasoy-Karaduman, 2015; Zaza et al., 1998; Çimen, 2003; Lockwood, 1989; Quarrier, 1993.

Data collection

In order to collect the study data, a semi-structured qualitative interview form was created. The questions were finalized by taking the opinions of three experts in the field of music and physical education. The participants were informed about the content and purpose of the study and that the interviews would be recorded. Their names were kept confidential in order to protect their personal information. Through a semi-structured interview form, the participants were asked whether they included exercise in their daily life (e.g. Do you exercise in your daily life? What kind of exercises do you do? What are your reasons for exercising/not doing it?), whether they exercise before the instrument starts to playing (e.g., Do you do warm-up/extension/stretching/strengthening exercises before playing the instrument?), whether they experience bodily pain (e.g., Do you experience any pain in your body due to instrument operation?), whether they have breath awareness (e.g., Do you include breathing exercises in daily life? Can you control your breath while playing the instrument?), and the effects of exercise (e.g., Does exercise affect your instrument work?). The interviews were face-to-face and lasted an average of 20-30 minutes.

Data Analysis

In this study, the data obtained were subjected to thematic analysis. Thematic analysis is an exploratory process (Rubin & Rubin, 1995) in which themes and concepts are revealed in six stages by examining the data in depth (Braun & Clarke, 2006). In the first stage, the entire data set was read without any analysis. In the second stage, the data set was read again and the initial codes were determined (e.g. “low back pain”, “shoulder pain” as the “instrument-induced pain” sub-theme). Thus, sub-themes were gathered under the major themes. In the third step, three randomly selected datasets were analyzed by 3 different experts with a PhD in music education for the peer debriefing procedure (Lincoln & Guba, 1985). In accordance with the experts' views, the code, sub-themes and themes were re-edited. In the fourth stage, a thematic map was drawn. At the fifth stage, the names of the themes and their scope were determined precisely. In the sixth stage, some of the encoded data contents were analyzed again and quotations from remarkable student statements were made according to the themes. As a result of this process, the results of thematic analysis were reported.

RESULTS

As seen in Figure 1, 4 main themes and 9 sub-themes emerged as a result of the thematic analysis. Statements regarding the emerging themes and sub-themes are given below.

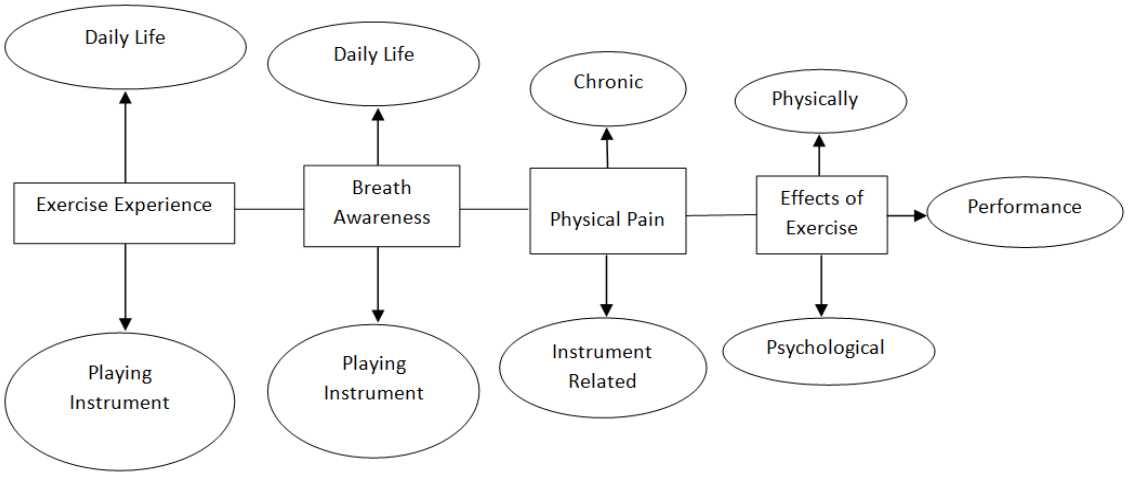

Figure 1: Main themes and sub-themes

Exercise Experience

In the study, two sub-themes emerged related to the main theme of "exercise experience". These are expressed as "daily life" and "playing instrument". Student statements regarding these two sub-themes are given below.

Daily Life

Only four of all participants in the study stated that they exercise regularly in daily life. It was understood that one of these participants had a history of stroke, one participant had Osteogenesis Imperfecta, and the other two participants exercised regularly in their daily life in order to stay fit and healthy. “I go to pilates regularly, three days a week. Since I have a stroke history, I am going both in terms of my muscles and in terms of being able to walk better and move more comfortably” (P1, Female, 22, Voice). “Yes I do, cardio, swimming and fitness. I continue to exercise to be fit and healthy” (P2, Male, 23, Voice).

Fourteen of the participants stated that they had previous experience of exercising, but they did not exercise regularly. Recently, they explained the reasons for not doing regular exercise with expressions such as school density, not being able to find time to prepare for KPSS, and not being able to adapt to the process after the pandemic. P3 (Female, 22, Flute), "I've done Judo before, but right now I don't do anything other than stretching myself. Usually when I get up in the morning… I don't have much time anyway." P7 (Female, 25, Cello), "No, I'm not doing it right now, but I was doing yoga before. I can't give a place due to the density at the moment. KPSS process, school…"

> I have been involved in a lot of sports in my past. I did volleyball, football and also fitness-based sports. I have not had such an exercise in the last year. After coming out of the pandemic, I couldn't adapt. Also, since I am a senior, this semester is very busy. That's why I didn't have much time (P16, Female, 21, Piano).

In Figure 2, the daily exercise experiences of the participants are given.

Figure 2: Exercises in daily life

Seven of the participants stated that they never did physical exercises in daily life. It was observed that these participants actually thought that they should do physical exercise, but did not know what to do and how to do it. It was remarkable that they stated that they did not have exercise habits or they did not think about it. P4 (Female, 22, Violin), "No, I'm not. I actually really want to do it. But I know it has to be. Maybe it's extra important for me as I play the violin, but I can't do it." P11 (Female, 22, Piano) "Sometimes I do, sometimes I don't. I don't do it every day. I cannot think of exercise." It was understood that the vast majority did not exercise regularly in daily life. Those who exercise regularly, on the other hand, exercise for health reasons and to look fit.

Playing Instrument

Only two of the participants stated that they exercised regularly before playing the instrument. One of this participant said that it was sufficient for her to exercise for a short time before starting the instrument, as she included these exercises in her daily life for about 4-5 months. It was understood that another participant only stretched her back, back, and arms for one minute before and during the study.

> I do finger strengthening. If stretching exercises took 45 minutes before, now 10 minutes is enough because my body is used to it. Because I do it every day. Not two days a week or just before work (P23, Female, 22, Violin).

> I stretch the fingers, flex my arms and so on, or flex my back. Before I pick up the violin, I always do 1 minute warm-up exercises in every practice. Sometimes when I take a break, I also do back stretches in the middle of work (P. 9., Female, 21, Violin)

Twenty-two of the participants said that they did not exercise regularly before playing enstrument. They emphasized that they do not have the habit of exercising, and that they do not need it. Many participants used voice warm up exercises, exercises to activate the diaphragm muscle, finger stretching, methods such as Marcel Moyse, scale and chromatic scale exercises, etc. They stated that they did the pre-warm-up work required by the

instrument lesson. They stated that they did not do regular exercise without an instrument for warming/stretching/strengthening their large muscles such as head, neck, shoulders and back. However, some students pointed out that they should exercise before playing the instrument, but they did not know what to do. For this reason, there are also participants who stated that preparatory physical exercises should be included before classes or studies, but that they should be given at the beginning by extending the course hours, by experts in this subject, as included in the official curriculum of the course. Based on these statements, it seems possible to interpret that the participants stated that these exercises can be carried out in a systematic and healthy way if they are performed by an expert instead of performing them on their own. In addition, one of the findings was that a participant thought that there was no possibility of injury while playing an instrument. "The difference between playing football and playing the flute is visibly clear. What could hurt me while playing the flute? So that's why… "(P6, Male, 22, Flute). "I do not do physical exercise. I rather open my finger on the keyboard. Sometimes I just stretch my back before I sit down. Ignorance is the reason why I don't do it" (P24, Male, 24, Guitar).

> Before I start playing the flute, I don't do anything other than flute warm ups. There are Marcel Moyse exercises, keeping a long note on the flute, playing the legato notes are exercise. I do not do any physical exercise. Actually, I knew something had to be done, but I didn't know what to do (P3, Female, 22, Flute).

Figure 3: Exercises for instrument training

As it is understood from the participant's statements, only two participants exercised before playing the instrument, and the other twenty-three participants did not do any physical activity on the instrument other than finger or voice warming up exercises.

Physical Pain

Two sub-themes related to the main theme of "physical pain" emerged in the study. These are expressed as "chronic" and "instrument related". Student statements regarding these two sub-themes are given below.

Chronic

Eight of the twenty-four participants in the study stated that they had chronic diseases related to the spine, such as humpback and scoliosis, due to some previous diseases or genetically. A participant with a history of stroke experienced walking difficulties and fibromyalgia in addition to postural dysfunction. One participant suffered from chronic pain due to Osteogenesis Imperfecta disease. It was understood that the pains caused by these disorders were usually related to the back, neck, shoulder (left shoulder) and arm (left arm). It was revealed that these pains were not caused by the instrument, but increased as the instrument playing time extended. P5 (Male, 26, Piano), "I already have scoliosis. My back hurts when I sit too much."

> After practicing the guitar and piano, I guess I always play the piano hunched, because I paid attention. My back especially hurts. I also have fibromyalgia. It hurts at the slightest thing, especially my left side (P1, Female, 22, Voice).

Instrument Related

All of the participants in the study stated that they experienced physical pain. It was understood that the localization of these pains might vary according to the instruments, but they were usually located on the left side

of the body. However, the participants who exercised regularly expressed that the pain they were experiencing before decreased or disappeared. In addition, the severity of pain increases as the working time increases. This situation causes the desire to finish the study as soon as possible. Some participants continued to play despite the pain. There is also a participant who stated that starting the instrument at a young age and maintaining the posture constitute an obstacle to pain. All participants reported pain, regardless of gender. When analyzed in detail, half of the males stated that they experienced pain due to a secondary instrument other than the main instrument. It was observed that female participants reported more pain than male participants. P10 (Female, 22, Violin), "I try even though it hurts but it is uncomfortable."

> After playing the accordion for a long time, I had edema on my left shoulder and even got a treatment for it. When I played the piano for too long, I had contractions and pressure in the wrists and arms (P22, Male, 29, Cello).

> While playing the clarinet, my back hurts, but when I play the bağlama, I have no pain because my posture is correct. Correct posture and starting at a young age have an impact (P18, Male, 22, Clarinet).

Table 2 shows the distribution of regions where physical pain is localized according to participant statements.

Table 2: Distribution of pain locations by instruments

Instrument	Location
Voice	Waist, back, gripes area (left)
Guitar	Left shoulder, fingers (left), waist, left arm
Flute	Left arm, back, elbow, wrist, neck
Piano	Neck, waist, gripes area, hand, wrist, arm, back
Clarinet	Waist
Double bass	Shoulder, gripes area (left), back (left), foot
Cello	Left side of neck, left arm, right thumb, foot, back
Violin	Lower neck, spine, back, shoulder, arm, wrist
Accordion	Left shoulder

Effects of Exercise

In the study, three sub-themes as "physical", "psychological" and "performance" emerged related to the main theme of "effects of exercise" and participant statements regarding these sub-themes are given below.

Physical

As seen in Figure 4, the physical effects of exercising were expressed by the participants as feeling comfortable, preventing pain and injury, and improving endurance and posture. The statements of the participants regarding these are given below.

Figure 4: Physical effects of exercise

P (Female, 21, Violin), "I think that doing these exercises makes working more durable and stronger by prolonging the working time." P9 (Male, 22, Guitar), "My posture improves. My fingers move faster."

Psychological

In Figure 5, the effects of exercising on psychology according to participant views are given. These are playing more confident, increase in concentration and motivation and decrease in stage anxiety. The statements of the participants regarding these are given below.

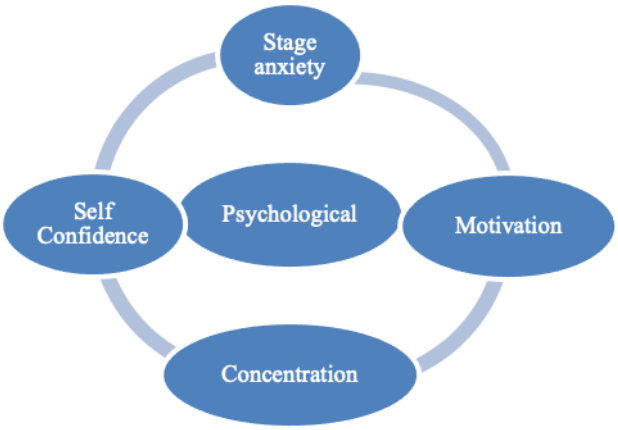

Figure 5: Psychological effects of exercise

> It has psychological effects and it is reflected in performance. It reduces the trembling of my hands as it reduces stress. If I do not experience pain, the working time will be longer and I can work harder. I don't have to worry about my back while playing. This way I can focus more on the piece I'm playing (P13, Male, 22, Piano)

> Warming up before working out helps the joints move more easily, I think. The time we spend with the instrument turns into a better quality. Because we don't linger with pain and we don't get distracted. Because if there is no pain, I will not stop working immediately, I will be able to work longer. My motivation will be higher (P22, Male, 29, Cello).
> I play more confidently. My self-confidence increases (P18, Male, 22, Clarinet).

Performance

In Figure 6, there are participant statements regarding the effects of exercise on instrument playing performance. Accordingly, the participants used expressions related to effects on intonation, holistic playing, nuance, prolongation of practice time, finger agility, more effective work, and better tone quality. Participant statements regarding these are given below.

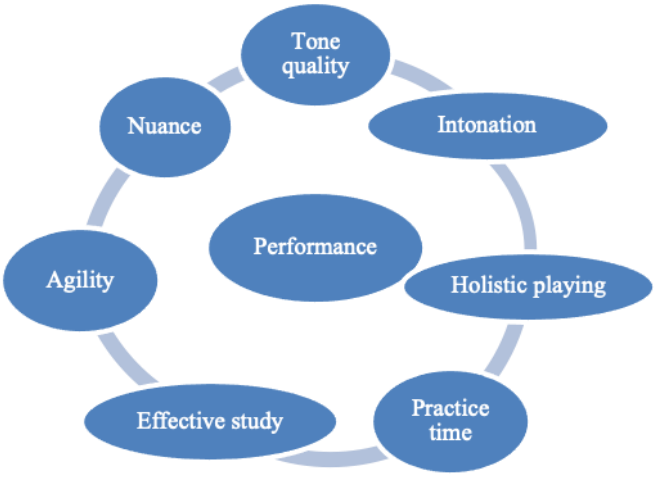

Figure 6: Effects of exercise on performance

> It's always the pain that keeps me from practicing. Especially my back… That's why I take a break, lie down a little later, and start practicing again. If I exercise, I will not have pain and I will be able to work longer and more effectively. My desire to practice decreases due to back pain (P11, Female, 22, Piano).

> It does affect performance, but only on a regular basis. It affects my tone positively. It even affects the nuances (P18, Male, 22, Clarinet).

Breath Awareness

In the study, two sub-themes emerged as "daily life" and "playing instrument" related to the main theme of "breath awareness", and participant statements regarding these sub-themes are given below.

Daily Life

In Figure 7, some exercises that the participants included in their daily lives related to breath awareness are given. Accordingly, the participants used expressions in their daily lives that they occasionally practiced breathing exercises during meditation, sound/breath therapy, yoga, and a technique called 4-7-8 breathing exercises. It was understood that breathing exercises in daily life had an effect on playing instrument.

Figure 7: Breath awareness in daily life

I do breathing exercises and even started sound therapy. These breathing exercises had an effect on my hoarseness. My voice is no longer hoarse. I am more conscious. I do not have such a problem now, as I am suddenly loaded when there are no warm-up movements. I was holding my breath from time to time while working. But I think that the breathing exercises in sound therapy automatically affect this situation as well (P5, Male, 26, Piano).

Sometimes I meditate. I breathe deeply in my daily life but not while working (P7, Female, 25, Cello).

Playing Instrument

The breathing exercises they practiced for instruments such as singing, flute and clarinet were voice/breath training, diaphragm breathing, long blowing, intermittent exercises with the "s" vocal, and long voice exercises. It was understood that for those whose main instrument was the piano, the course included exercises such as yoga breathing before concert as a result of the suggestion and guidance of the instructor, but they did not practice these exercises regularly and consciously before each practice.

The majority of the participants stated that they did not do breathing exercises and did not have awareness of breathing. They lost their breath control involuntarily, forgot to breathe or held their breath in difficult passages, missed their breath (for wind instruments and singing) while playing the instrument or performing a performance.

The problems in breathing were also due to performance anxiety. However, they seem to have the opinion that doing regular breathing exercises will help reduce the level of anxiety. In summary, the participants did not practice the preparatory body exercises, such as finger opening, chromatic scale work, etc. Apart from the practices, it can be said that they did not regularly include stretching/strengthening exercises for large muscle groups without an instrument, and they also showed an approach consisting of exercises such as breathing, voice and diaphragm training with instruments, in breath awareness. It was also seen that a participant thought it was normal to hold their breath.

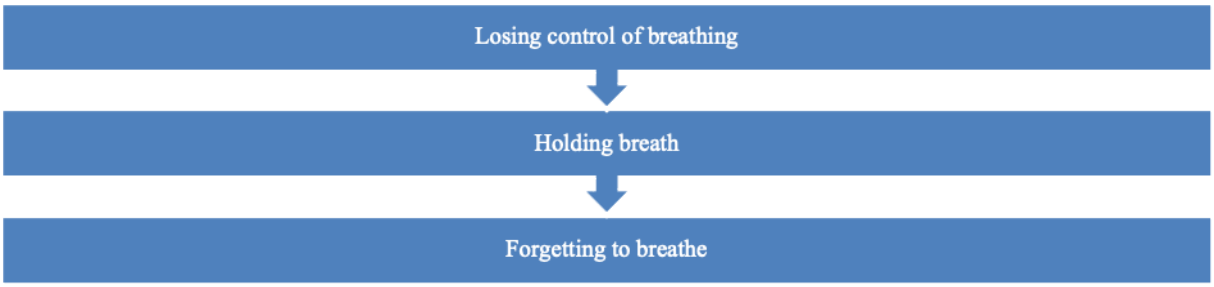

Figure 8: Breath awareness in instrument playing

> It varies according to the piece. I find myself holding my breath without realizing it. I think this is normal given the course of the piece. I am also holding my breath when playing long sounds and soft playing. I don't do any breathing exercises for this. I don't recall or I'm not used to (P7, Female, 25, Cello).
>
> When playing the flute, sometimes there are certain passages and I involuntarily lose my breath control there while playing. I hold my breath too much (P3, Female, 22, Flute).
>
> I am not doing breathing exercises. I never noticed that I was holding my breath. I don't think I have breath awareness when playing an instrument (P19, Male, 22, Guitar).

Conclusion and Discussion

There are 13 female and 11 male participants in this study. All participants reported pain, regardless of gender. Half of the men stated that they experienced pain due to a secondary instrument other than the main instrument. It was observed that female participants reported numerically more pain than male participants. Allsop & Ackland (2010); Zaza & Farewell (1997); Paarup et al. (2011); Fry & Rowley, (1989); Heinan (2008); Lockwood (1989); Fishbein et al. (1988) found that women reported more and more discomfort than men. Despite that De Smet et al. (1998) stated that there was no difference between men and women in this regard, but those with high hand range among women reported fewer injuries than those who did not.

As a result of the study, it was revealed that the majority of the participants did not regularly exercise in their daily life. A small number of participants who included exercise in their daily life exercised due to some ailments such as paralysis and bone diseases in their past, and some of them exercise in order to be fit and healthy. It is among the results of the research that regularly doing exercise in daily life also has an effect on playing instrument. Although more than half of the participants had previously exercised in their daily life, it was seen that they did not do it regularly. They could not find time to exercise due to the preparation process for KPSS and the intense classes at school. In addition, their inability to adapt to the new process due to the change of their order after the Covid-19 pandemic process was among these reasons.

The majority of the participants, on the other hand, did not exercise in their daily life, and they explained the reasons for this as having no habits in this regard, not thinking of doing exercise, and not knowing what to do about exercise and how to do it. This situation shows that instrument students do not have awareness about musician diseases and their causes. In addition, it can be said that the level of body awareness of some of the students is not high. These results are in agreement with Yalazer (1994), Duranoğlu (2015), Seçkin (2020), Bağcı & Topdemir (2019), Ergin (2016).

It was understood that some of the participants in the study had chronic diseases related to the spine such as humpback and scoliosis, which they said were genetic. Many diseases such as scoliosis, kyphosis, lordosis, low back pain and hernia, neck pain and hernia, spondylolisthesis, ankylosing spondylitis, facet syndrome are called spinal diseases (Arslan, 2021). It has been determined that musicians have scapula disorder and lumbopelvic stabilization system disorder (Steinmetz et al., 2010). Postural disorders are common in string instrument players due to asymmetrical posture (Kendal & Çıtaker, 2021). In addition, one participant in this study, who had a history of stroke, had gait difficulties and fibromyalgia in addition to posture disorder. One participant suffered from chronic pain due to Osteogenesis Imperfecta disease. The pains caused by these disorders were generally associated with the back, neck, shoulder (left shoulder) and arm (left arm). These pains did not caused by the instrument, but increased as the instrument working time got longer.

Some participants stated that they did not have the habit of exercising while playing the instrument as in daily life, while a few participants said that they did not need exercise. Another important result is that none of the

participants, except for two participants, do regular physical exercises before the playing instrument. These results are in agreement with Atasoy-Karaduman (2015), Arslan (2017), Bağcı & Topdemir (2019), Yalazer (1994).

The reason why some of the participants did not exercise for playing the instrument was that they did not know what to do, although they thought that they should exercise before starting the instrument, as in daily life. For this reason, there are participants who stated that preparatory physical exercises should be included before the lessons or studies, but that they should be given at the beginning by extending the course hours, by the competent people, as included in the official curriculum of the course. Demirci et al. (2017) revealed that although instrument teachers thought that exercise was important, they did not adequately direct students to exercise.

Many participants practiced sound warming, methods such as Marcel Moyse, scale/chromatic sequence work, finger opening, etc. It was concluded that they had done the pre-warm-up studies required by the instrument class. Yalazer (1993) and Ergin (2016) showed similar results in their studies. It was observed that the participants did not do regular exercises to warm up/stretch/strengthen their big muscles such as head, neck, shoulders and back without an instrument. A few participants only reflexively stretched their lower back, waist, and arms for one minute or just before they started playing. Atasoy-Karaduman (2015) similarly, concluded that the students did exercises such as moving/shaking/relaxing the neck, arms and shoulders with the studies in scale/arpeggios, Reichert, Taffanel and Moyce methods.

All of the participants in the study reported experiencing physical pain. It can be said that among the causes of these pains (except for those with chronic diseases) is not to include warm-up exercises. According to Önder (2013) and Atasoy-Karaduman (2015), among the causes of pain are not doing enough warm-up exercises.

Although the areas where the pain is localized may vary according to the instruments, they are usually located on the left side of the body. It was understood that it was located in the back, arm, shoulder, elbow, hand, wrist and waist region. Various studies reveal that musicians who play instruments experience pain in similar areas (Akı, 1995; Yağışan & Başkurt, 2016; Seçkin, 2020; Arık, 2012; Heinan, 2008; Zaza, 1998; Zaza et al., 1998; Steinmetz et al., 2010; Kendal & Çıtaker, 2021; Karabay, 2020; Urganioğlu, 2019; Akarcalı, 2018; Önder, 2013; Fishbein et al., 1988; Paarup et al., 2011; Genç et al., 2002). Elbeyi & Sakar (2020) reported that the students' posture and holding position problems related to the student's tightening of the left arm muscles.

Participants whose main instrument was singing reported pain in the lower back, left side of the back. It was revealed that guitarists left shoulder, fingers (left), lower back, left arm; flutists on the left arm, back, elbow, wrist, neck; pianists neck, waist, hand, wrist, arm, back; clarinet players low back pain; double bass players shoulder (left), back (left) and feet; left shoulder in accordion; violinists lower neck, spine, back, shoulder, arm, wrist pain and left side of neck, left arm, right hand thumb, back and foot pain in cellists.

When the literature was examined, it was seen that the pianists experienced pain in body parts similar to this study (Hochberg et al., 1983, Lederman, 2003; De Smet et al., 1998; Rietveld, 2013; Ostwald et al., 1994; Tahilram et al., 2018). Similarly, violinists have pain in the upper extremity (Rietveld, 2013; Ostwald et al., 1994) and left arm (Lederman, 2003) upper extremity ailments may occur in guitarists (Rietveld, 2013; Ostwald et al., 1994), and in wind instruments players, discomforts related to the left hand and left wrist (Paarup et al., 2011) may occur. Those who play string instruments experience more pain than other instruments (Zaza & Farewell, 1997; Steinmetz et al., 2010; Kaufman-Cohen & Ratzon, 2011; Paarup et al., 2011; Lockwood, 1989). Fry & Rowley (1989) was revealed that pain was mostly associated with cello, clarinet and flute. According to Açıkalın (2019), stringed instruments were found to be very risky in terms of ergonomics.

It was observed that the severity of pain increased as the duration of the study increased. These results are compatible with Seçkin (2020); Yağışan & Başkurt (2016); Arslan (2017); Schaefer & Speier (2012); Allsop & Ackland (2010); Lockwood (1989); Fry (1987). Kenny & Ackermann (2015) found a significant relationship between the severity of performance-related pain and its frequency. Fry & Rowley (1989) emphasized that the duration of the study had an effect on the level of pain, but the intensity of the study had a greater effect than the duration. Unlike the results of the study, Atasoy-Karaduman (2015) revealed that the working time has no direct relationship on pain. It was understood that the participants who experienced pain wanted to quit the study as soon as possible. Some participants continued to work despite the pain. Bağcı & Topdemir (2019) similarly reported that students who experienced physical pain due to playing continued to work despite this. It is an effective method for the prevention and treatment of diseases caused by excessive use, taking breaks from work and shortening the working time (Fry, 1986; Fry, 1988; Allsop & Ackland, 2010; Zaza & Farewell, 1997; Fishbein et al., 1988; Akbey, 2019; Kava et al., 2010). Duranoğlu (2015) stated that forcing students to work

would have negative effects on playing performance, physical and mental health, as it would push students to take a break for too long.

It was reported that the participants who exercised regularly had reduced or disappeared their previous pain. Regular exercise has physical effects such as feeling comfortable, preventing pain and injury, improving endurance and posture. Arık (2012); Zaza & Farewell (1997); Fishbein et al. (1988); Akbey (2019); Yağışan (2002) found similar results. On the other hand, De Smet et al. (1998) concluded that warm-up exercises had no significant effect on overuse syndromes in pianists.

Regular exercise has psychological effects such as playing more confidently, increased concentration, increased motivation, and reduced stage anxiety. Kenny & Ackermann (2015); Fry (1987); Jabusch et al. (2004); Kendal & Çıtaker (2021); Karabay (2020); Fishbein et al. (1988) demonstrated that pain was associated with depression, anxiety, and stage anxiety in musicians. Pain negatively affects concentration (Yağışan & Başkurt, 2016). In addition, stage fright and stress can cause physical discomfort in musicians, as well as cause these disorders to become chronic (Schuppert & Altenmüller, 1999; Rietveld, 2013). Stress, especially performance anxiety, negatively affects performance (Lockwood, 1989).

It has been understood that regular exercise has effects such as better musical tone, intonation, holistic playing, nuance, finger agility, more efficient working, and prolongation of playing time for instrument playing performance. Duranoğlu (2015), concluded that pain negatively affects musicality by affecting playing time. Exercise positively affects playing performance by increasing body endurance (Kava et al., 2010). Babaç et al. (2021) revealed that yoga has a positive effect on vocal training in terms of performance, technique and music. Akarcalı (2018) reported that warm-up exercises have positive effects on piano performance in terms of technique, nuance and tempo.

There were a small number of participants who regularly performed breathing exercises during various activities in their daily lives, such as during meditation and yoga, and during sound/breath therapy. It was seen that the breathing exercises of the participants for instrument study were mostly vocal/breath warming up, diaphragm breathing, long blowing, staccato exercises with the “s” vocal and long voice exercises for instruments such as singing, flute and clarinet. It was understood that those whose main instrument was the piano did yoga breathing before the concert with the advice of the lecturer, but they did not practice these exercises regularly and consciously before each practice. A large majority of the participants stated that they did not do breathing exercises and did not have breath awareness. Ergin (2016) revealed that the students were not paying attention to his breathing. Also, disorders in posture have an effect on proper breathing (Urganioğlu, 2019).

It was observed that some participants involuntarily lost control of breathing while studying instrument or during a performance, forgotten to breathe or hold their breath in difficult passages, missed their breathing space (for wind instruments and singing). Many participants' approach to breath awareness was exercises such as breathing, warming up the voice, working out the diaphragm, which were performed accompanied by an instrument. It appeared that the breathing problems were due to performance anxiety. It was seen that the participants had the opinion that doing regular breathing exercises would help reduce their anxiety level. Kava et al. (2010) stated that breath control positively affects performance by contributing to endurance. In this study, it was noted that one participant thought that it was normal for him to hold his breath.

Based on the results of the research, it can be said that preparatory physical exercises should be performed before instrument study and individual instrument lessons. In this context, a section on warm-up exercises should be added to the instrument course curriculum. It should be connected to music teaching undergraduate programs as an independent course under the name of “body awareness”. Similar studies should be continued by addressing different instruments and teaching levels. It is recommended that instrument teachers be encouraged to have knowledge about preparatory physical exercises.

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