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ORIGINAL RESEARCH PAPER

HYDROTHERAPY-STIMULATED RESPIRATORY SYSTEM REHABILITATION FOR PEOPLE RECOVERING FROM COVID-19

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Abstract

The COVID-19 pandemic has obvious effects on people's health and mental state. COVID-19 is known to be a respiratory disease that is usually mild and starts gradually with such symptoms as fever, cough, sore throat, difficulty breathing. Therefore, after recovery from COVID-19, people should pay close attention to respiratory rehabilitation. The aim of this study was to improve respiratory rehabilitation process with hydrotherapy. The pilot study was carried out in view of the research aim from 17 January 2022 to 20 February 2022 at Salaspils swimming pool. 12 subjects (females) aged 19-62 recovering from COVID-19 took part in the pilot study and were observed up to one month after COVID-19. A course of breathing exercises in water was prepared. The course consisted of 10 practical lessons 45 minutes each. The analysis of the average result dynamics in the heart rate and oxygen saturation measurements during the experiment showed that the difference was statistically insignificant, $\alpha>0.05$. The analysis of the breathing frequency dynamics during the experiment showed that the difference was statistically insignificant, $\alpha>0.05$, but the difference in chest excursion was statistically significant, $\alpha<0.05$. The analysis of the PEF dynamics during the experiment showed that the difference was statistically significant, $\alpha<0.05$, which implied an increase in the subjects' PEF after the research and that their respiratory system worked more efficiently. The effectiveness of the hydrotherapy-stimulated respiratory system rehabilitation course was positive in terms of PEF and chest excursion difference. This pilot study experimental group helped to determine the next steps of the study and specified if any adjustments in the methodology was required.

One of the steps is to improve the validity of the study for which the number of subjects should be increased (n=30).

Keywords: *COVID-19, respiratory system, hydrotherapy.*

Introduction

The COVID-19 pandemic has obvious effects on people's health and mental state. Two years have passed since the coronavirus outbreak, and there seems to be no end in sight. COVID-19 is known to be a respiratory disease that is usually mild and starts gradually with such symptoms as fever, cough, sore throat, difficulty breathing.

About one in six people infected with COVID-19 has a severe course of the disease, with severe breathing problems. Therefore, after recovery from COVID-19, people should pay close attention to respiratory rehabilitation. Above all, it is necessary for people to improve their quality of life and be able to return to their normal pace of life as soon as possible.

Hydrotherapy is known to be an integral part of rehabilitation after various diseases. It is often used to improve the respiratory function and results in a decrease in the vital capacity (at 40ºC) and an increase in the respiratory function.

Depending on water temperature, changes in the respiratory muscle function can also have a positive effect on lung volume.

Material and methods

Pedagogical experiment (a pilot study). The pilot study was carried out in view of the research aim from 17 January 2022 to 20 February 2022.

The pilot study was conducted to identify the efficiency of hydrotherapy for respiratory rehabilitation after the COVID-19 disease. During the pilot study, comparable pedagogical processes took place in one group.

12 subjects (females) aged 19-62 recovering from COVID-19 took part in the pilot study and were observed up to one month after COVID-19.

The average age of all the subjects involved in the experiment was 48.7±15.2 years, the mean height – 172.4±10.6cm, and the mean weight – 83.8±20.5kg. The experiment was carried out at Salaspils swimming pool.

A course of breathing exercises in water was prepared. The course consisted of 10 practical lessons 45 minutes each.

The practical classes included an introductory part (7min) to prepare the body for the main exercises of the practical lessons followed by the main part (35min) consisting of 10 exercises for respiratory rehabilitation. In the final part of the practical lesson (3min), the main task was to calm the body after exercise by virtue of a light freestyle swim.

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The purpose of the course is based on the respiratory rehabilitation objectives as follows:

- to restore the respiratory rate;
- to teach the subjects to breathe properly in water;
- to reduce shortness of breath;
- to improve the efficiency of lung ventilation;
- to normalize the respiratory muscle function and exercise tolerance;
- to improve the airway function;
- to improve the subjects' quality of life;
- to educate the subjects.

Before starting the research, the following measurements were taken with follow methods: oxygen saturation, chest excursion, breathing frequency, and the peak expiratory flow.

Fingertip pulse oximeter

The basic function of the respiratory system is to supply the body with oxygen (O_2) and expel carbon dioxide (CO_2). Oxygen saturation (SpO_2) can be determined indirectly using a pulse oximeter.

The amount of oxyhaemoglobin relative to the total haemoglobin is expressed as a percentage – oxygen saturation characterizes the amount of oxygen circulating in the blood. The SpO_2 rate is 98 – 96% depending on age (Collins, Rudenski & Gibson, 2015).

SpO_2 was determined using a DELUXA fingertip pulse oximeter (DELUXA, China) (Figure 1).

Before SpO_2 was measured, the subjects remained at rest in a sitting position for 10 min. The measurement was then taken with their palm resting on a table, and the radial artery free from compression. The reading was considered reliable after at least 30s of stable signal (Goldberg, Buhbut & Mimoun, 2012).

Figure 1. DELUXA fingertip pulse oximeter (photo from the Author's archive)

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Anthropometry (chest excursion)

The anthropometric measurements were taken at rest, arms at sides after inhaling and holding a deep breath to evaluate morphological features and changes there of because of systematic lessons. Chest circumference was measured using a measuring tape, placing it in the middle of the pectoralis major muscle.

Breathing frequency

The lungs are a passive organ – they cannot shrink or expand on their own. Respiratory movements are due to the intercostal muscles and diaphragm.

With each normal breath, an adult inhales, and exhales about 0.5l of air. One of the main vital signs of the human body is respiratory rate (the number of breaths taken per minute). To take the initial measurements, the subjects were asked to stand in a relaxed position with their hands raised to measure the girth with a measuring tape, and then to put their hands down. Afterwards, they were asked to inhale and hold their breath to repeatedly take the measurements.

Peak expiratory flow meter

The subjects of the study underwent three measurements of the peak expiratory flow (PEF) in one examination, with each subject's best result recorded.

The maximum expiratory flow measurements after rapid and intense exhaling were performed using a DATORSPIR PEAK-10 peak flow meter (SIBEL.S.A.U., Spain) (Sibelmed, 2020) (Figure 2).

Figure 2. DATORSPIR PEAK-10 peak flow meter (SIBEL.S.A.U., Spain) (photo from the Author's archive)

First, the procedure for taking measurements was demonstrated: a subject was to sit on a chair with their back straight or leaning back on the chair, to breath in as deeply as they could and then to blow air into the

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mouthpiece of the handheld instrument as quickly and as hard as they could. The test was done three times noting the highest speed of the three.

Based on the results of the rehabilitation course, the overall dynamics of the basic respiratory indicators could be analyzed to determine the severity of post-COVID-19 effects on the respiratory system, as well as the efficiency of hydrotherapy-stimulated respiratory system rehabilitation.

Mathematical statistics

The results obtained in the experiment were processed using the IBM SPSS mathematical statistics software where several statistical analysis solutions were used (IBM, 2020), namely:

- Descriptive statistics
- Kolmogorov-Smirnov test
- Paired-samples t-test
- Two-related-samples tests.

A difference is not statistically significant if $\alpha>0.05$, and a difference is statistically significant if $\alpha<0.05$.

Results

The analysis of the research result dynamics and the evaluation of efficiency of the developed respiratory system rehabilitation programme during the experiment considered the experimental group's dynamics in terms of respiratory indicator measurements.

The analysis of the subjects' heart rate and oxygen saturation (SpO_2) at the start and end of the research (Figure 3) showed that before and after the research the measurements of the heart rate ($p=0.104$) and oxygen saturation ($p=0.157$) were quite similar and statistically not different ($\alpha>0.05$).

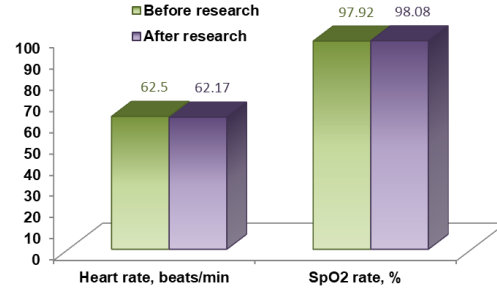

Figure 3. Dynamics of the average heart rate and oxygen saturation measurements in the experimental group (n=12)

The mean result of the heart rate in the experimental group before the pedagogical experiment was 62.5±7.7beats/min and after the experiment – 62.17±7.96 beats/min (Figure 3).

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At the end of the research, the heart rate at rest was by 0.33±0.65beats/min lower than at the beginning of the pedagogical experiment.

The mean oxygen saturation (SpO_2) result in the experimental group increased from 97.92±1.08% to 98.08±0.79%, while in the pedagogical experiment the increase was about 0.16% (Figure 3).

The analysis of the subjects' average difference in chest excursion and breathing frequency at the start and end of the research (Figure 4) showed that before and after the research breathing frequency measurements (p=0.096) were quite similar and statistically not different (α>0.05), and chest excursion (p=0.001) was different and statistically significant (α<0.05).

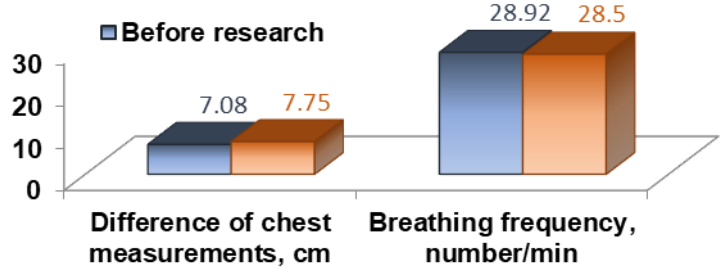

Figure 4. Dynamics of the average results in terms of difference in chest excursion and breathing frequency in the experimental group (n=12)

The mean breathing frequency result at rest in the experimental group before the experiment was 28.92±3.4number/min, and after the experiment – 28.5±3.15number/min (Figure 4).

At the end of the research, breathing frequency at rest was by 0.42±0.49number/min lower than at the beginning of the experiment.

The mean result of a difference in chest excursion in the experimental group increased from 7.08±1.56cm to 7.75±1.42cm, while in the pedagogical experiment the increase was about 0.67±0.49cm (Figure 4).

The analysis of the subjects' peak expiratory flow (PEF) at the start and end of the research (Figure 5) showed that before and after the research the PEF measurement (p=0.001) difference was statistically significant, α<0.05.

The mean PEF result in the experimental group before the experiment was 370.83±75.25L/min, and after the experiment – 397.5±77.24L/min (Figure 5).

At the end of the research, PEF was by 26.67±21.88L/min higher than at the beginning of the experiment.

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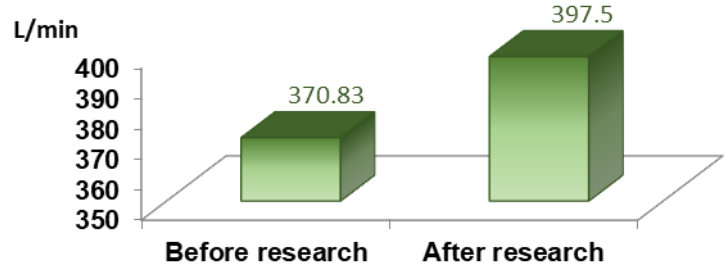

Figure 5. Dynamics of the average results in PEF measurements in the experimental group (n=12)

The effectiveness of the hydrotherapy-stimulated respiratory system rehabilitation course was assessed based on the results obtained after 10 practical lessons.

Discussion

Description of the results and comparison of oxygen in arterial blood (SpO_2). The content (or concentration) of oxygen in arterial blood (SpO_2) is expressed in mL of oxygen per 100mL or per L of blood, while arterial oxygen saturation (SpO_2) is expressed as a percentage representing the overall percentage of binding sites on haemoglobin occupied by oxygen. In healthy individuals breathing room air at sea level, SpO_2 is between 96% and 98%. The maximum volume of oxygen which the blood can carry when fully saturated is termed the oxygen carrying capacity, which, with a normal haemoglobin concentration, is approximately 20mL oxygen per 100mL blood (Collins, Rudenski & Gibson, 2015).

Description of the results and comparison of chest measurements.

A difference in chest measurements shows how much the chest circumference increases with deep breathing compared to deep exhalation. The circumference of the thorax is measured at the point of attachment of the fifth rib to the sternum. The average difference in chest excursion for healthy, well-trained people is 10 – 12cm (Daugavpils Universitāte, 2002).

Description of the results and comparison of breathing frequency.

The normal breathing frequency in an adult patient is 12 – 20breaths/min and may vary normally with increased physical activity and sleep. In the context of illness, an increased breathing frequency (i.e. tachypnea, defined as a breathing frequency over 20 breaths/min) may indicate conditions such as hypoxia, pain, cardiac insufficiency, or metabolic disturbances like lactic acidosis. Decreased breathing frequency (i.e. bradypnea, defined as a breathing frequency below 12 breaths/min) may indicate neurologic depression or even more severe cases of hypoxia (Scott & Kaur, 2020).

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Description of the results and comparison of peak expiratory flow (PEF) measurements.

To interpret the significance of peak expiratory flow measurements, a comparison is made to reference (normal, predicted) values based on measurements taken from the general population. Various reference values have been published in the literature and vary by population, ethnic group, age, sex, height, and weight of the patient. For this reason, tables or charts are used to determine the normal value for a particular individual (figure 6) (Wikiwand, 2010).

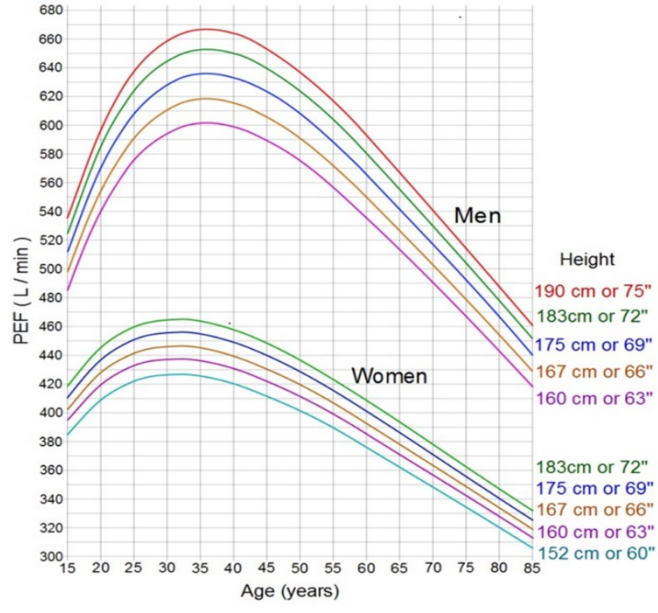

Figure 6. Normal values for peak expiratory flow (PEF) NE 13826 or EU scale (Clement Clarke International, 2004; Miller, 2004).

There are a few non-equivalent scales used in the interpretation of peak expiratory flow (Miller, 2004).

Some examples of Reference Values are given below. There is a wide natural variation in results from healthy test subjects.

Conclusion

The comparison of the average results in different measurements before the research with the results at the end of the research showed changes in two indicators.

The analysis of the difference in chest excursion was statistically significant, $\alpha<0.05$.

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The analysis of the PEF dynamics during the experiment showed that the difference was statistically significant, $\alpha<0.05$, which implied an increase in the subjects' PEF after the research and that their respiratory system worked more efficiently.

The effectiveness of the hydrotherapy-stimulated respiratory system rehabilitation course was positive in terms of PEF and chest excursion difference.

This pilot study experimental group helped to determine the next steps of the study and specified if any adjustments in the methodology were required.

One of the steps is to improve the validity of the study for which the number of subjects should be increased (n=30).

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ORIGINAL RESEARCH PAPER

FUNCTIONAL MOVEMENT SCREEN (FMS^{TM}) AND BALANCE IN BODYBUILDERS DURING THE DEFINITION PERIOD

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Abstract

The functional movement and balance performances of bodybuilders and the relationship between them arouse curiosity in the definition period where intense restrictions are experienced. The aims of this study were to (a) determine functional movement screening (FMS^{TM}) and balance performance in bodybuilders during the definition period and (b) examine the relationship between these tests. Twelve adult male bodybuilders voluntarily participated in the study. Participants performed flamingo balance test for static balance, upper & lower quarter Y-balance test (YBT-LQ & YBT-UQ) for dynamic balance, and FMS ^{TM} tests (deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, trunk stability push-up, and rotary stability) for functional movement screening. There was a significant negative correlation between dominant leg static balance and rotary stability (r=-.832, p=.040) and a significant positive relationship between dynamic balance and rotary stability in dominant and non-dominant leg (dominant leg: r=.589, p=.044, non-dominant leg: r=.775, p=003). There was no significant relationship between YBT-UQ composite scores and FMS^{TM} composite scores on both sides in bodybuilders during the definition period. As a result, the FMS ^{TM} score is quite low in bodybuilders during the definition period, and the increase in static and lower extremity dynamic balance performance may increase the rotary stability score. Bodybuilders are recommended to practice lower extremity static and dynamic balance exercises in addition to training during the definition period.

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Key words: *Bodybuilding, functional movement screen, balance.*

Introduction

Bodybuilding is one of the most fundamental exercise methods to increase coordination, balance and muscle strength (Steele et al., 2019). The use of multi-joint exercises such as bodybuilding has been reported to improve coordination, balance and proprioception (Vaughn & Micheli, 2008). In bodybuilding where additional equipment is used, there is a risk of injury during movements such as squats, weightlifting and pulls and similar movements (Matuliunas, 2020). It is very important to determine the strengths and weaknesses of the athletes, since they are exposed to more biomechanical loads than they can tolerate, which also brings the risk of injury (Arghadeh et al., 2018). It has been reported that as the frequency of weekly training decreases in bodybuilding and fitness sports, there is an increase in the elbow, wrist, forearm, and foot-ankle injuries (Çetinkaya et al., 2017).

Some tests that can predict injury, such as balance and FMS^{TM}, are functional screening tools used by coaches and clinicians to determine physical dysfunctions or functional asymmetries. The YBT-LQ test, one of the dynamic balance tests, is used to measure trunk and lower extremity function (Cengizel & Cengizel, 2019; Myungsun Lee & Han, 2016).

In the literature, there is no consensus in studies conducted with FMS^{TM} and balance. In a study, it was determined that dynamic balance can be predicted with FMS^{TM} test scores. The scores of 2 on the deep squat and 3 on the trunk stability push-up movements predicted a greater composite reach. In addition rotary stability score of 3 predicted better overall stability indices. In addition, having a higher FMS^{TM} score (score higher than 14) exhibits higher composite reach (Scudamore et al., 2019). Conversely, another study shows that injury history negatively affects FMS^{TM} performance and does not affect YBT performance (Chimera et al., 2015). It has also been reported that static balance measurements in stable and unstable conditions do not discriminate groups of young adults assessed by the FMS^{TM} (Trindade et al., 2017). Perry (2015) did not find a significant relationship between FMS^{TM} and balance in hockey players ($r=0.14$, $p=0.67$). While it was found that the FMS^{TM} composite score did not change in acute responses after exercise and was not associated with static balance, a significant relationship was determined between exercise-related changes during static balance and hurdle step, in-line lunge and active straight leg raise (ASLR) (Clifton et al., 2013).

While preparing athletes for competitions in bodybuilding involves long training periods, this preparation process consists of two phases: (a) bulking (b) cutting.(Steele et al., 2019) The bulking phase is characterized

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by the aim of maximizing muscle growth, often using a rigid meal plan, and maintaining the anabolic process and lasts for months (Lambert et al., 2004). The cutting phase is characterized by fat loss, muscle mass preservation and calorie reduction and contains 8 – 16 weeks before competitions (Hackett et al., 2013; Lambert et al., 2004). Muscle definition is achieved through reduction of muscle glycogen sources and dehydration of the muscles (restriction of water and sodium intake, often the use of diuretics the day before the competition) in the last week before the competition (Steele et al., 2019; Steen, 1991). The functional movement and balance performances of bodybuilders and the relationship between them arouse curiosity in this definition period where intense restrictions are experienced. In the literature, some studies using these tests that can predict the risk of injury have been found (Altundağ et al., 2021; Atalay & Atalay, 2021; Daneshjoo et al., 2020; Zarei et al., 2022). There are also studies examining the relationship between FMS ™ and balance in different sports disciplines (Arazzadeh & Norastch, 2018; Harshbarger et al., 2018; Kramer et al., 2019; Lisman et al., 2018; Pourheydari et al., 2018). However, research on FMS™ and balance performance in bodybuilders is very limited (Matuliunas, 2020; Tafuri et al., 2016). To the best of author's knowledge, there is no study investigating the FMS™ and balance performance of bodybuilders during the definition period. Therefore, the aims of this study were to (a) FMS™ and balance performance in bodybuilders during the definition period and (b) to examine the relationship between these tests.

Materials and Methods

Participants. The current study is is a cross-sectional and correlational study conducted with field performance and screening tests. Twelve healthy adult male bodybuilders voluntarily participated in the study. Ten of the participants compete in athletic physics and two in bodybuilding disciplines. Athletes were informed about the study protocol before the measurements and informed consent were obtained. All athletes participated in the measurements while they were in the definition period. Inclusion criteria were (a) being an adult male bodybuilder (b) training for a minimum of 4 hours per week (c) having a definition period (d) having participated in bodybuilding competitions at least once (e) being actively preparing for competitions. Exclusion criteria were (a) having any musculoskeletal injury or operation in the last six months (b) experiencing a bulking phase (c) not participating in one of the test protocols or leaving voluntarily. Before the measurement, the dominant legs of the athletes were questioned. The leg that was thrown forward first in the forward falling motion while in the anatomical stance was accepted as the dominant leg. The dominant leg of the three participants was the left and all

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the remaining athletes were the right. The research was carried out according to Helsinki Declaration and was approved by the University Ethics Committee (Research code: 2022-077).

Study design. Measurements were taken in a single day before the competition. Flamingo balance test for static balance, YBT-LQ & YBT-UQ test for dynamic balance, FMS^{TM} test for functional movement were applied in the measurements, respectively. Balance measurements were performed on the dominant and then non-dominant sides of the athletes.

Static balance. Flamingo balance test was used to measure static balance. Familiarization was applied to the athletes for 10 seconds before the test. In this test, the athlete stood in balance with one foot on a metal balance beam (50cm long, 4cm high and 3cm wide) and bent the other foot back at the knee, pulled it toward his hip, and held it with the hand on the same side. In this position, the athlete tried to stay in balance while maintaining his body integrity. As soon as the position was achieved, the time was started with the stopwatch. It was asked to maintain this balanced state for one minute. When the balance is disturbed (if he releases his foot while holding it with his hand, falls off the balance board, touches the ground with any part of his body, etc.), the timer is stopped. When the athlete got on the balance beam and regained his balance, the time was restarted from where he left off. The number of falls of the athlete during one minute was recorded as the static balance score. After the test was applied to both sides, it was repeated two more times and the average of three trials was recorded.

Lower Quarter Y-Balance Test (YBT-LQ)

Lower quarter Y-Balance test (YBT; Move2Perform, Evansville, IN) was applied to measure lower extremity dynamic balance according to criteria described by Plisky et al. (2009) In this test, the athletes were asked to lie on the Y-shaped strip on the floor (angle of 135 degrees between the anterior and posterior directions and 90 degrees between the posterior directions) while balancing with one foot, while reaching out in the directions (anterior, posteromedial, posterolateral) determined with the other foot. Maximum reach percentage calculated by dividing reach distances by leg length. The composite score was calculated by dividing the sum of the three directions by three times the leg length. Dominant-to-non-dominant side reach distance difference were calculated in cm (reach distance difference = [maximum dominant reach distance – maximum non-dominant reach difference]) (Lisman et al., 2018). Dynamic balance was applied 3 times in each direction. Scores were recorded separately for the dominant and non-dominant leg. Internal reliability of this test was reported as excellent (ICC=0.88–0.99, $p \leq 0.01$) (Feizolahi & Azarbayjani, 2014).

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Upper Quarter Y-Balance Test (YBT-UQ). Upper quarter Y-Balance test (YBT; Move2Perform, Evansville, IN) was applied to measure upper extremity dynamic balance. In this test, the athletes were asked to lie on the Y-shaped strip on the floor (angle of 135 degrees between the medial and lateral directions and 90 degrees between the lateral directions) while balancing with one hand, while reaching out in the directions (medial, superolateral, inferolateral) determined with the other hand. The Maximum reach percentage was calculated by dividing reach distances by arm length. The composite score was calculated by dividing the sum of the three directions by three times the arm length Dominant-to-non-dominant side reach distance difference were calculated in cm (reach distance difference = [maximum dominant reach distance – maximum non-dominant reach difference]) (Lisman et al., 2018). Dynamic balance was applied 3 times in each direction. Scores were recorded separately for the dominant and non-dominant leg. Internal consistency of this test was reported as excellent (ICC=0.80–0.99) (Gorman et al., 2012).

Functional movement screen. FMS^{TM} test consists of seven fundamental movements that include mobility and stability balance. These are deep squat, hurdle step, in-line lunge, shoulder mobility, ASLR, trunk stability push-up, rotary stability (Cook et al., 2014b, 2014a). Before the FMS^{TM} analysis, the athletes were asked not to start training and not to do any stretching exercises in order not to affect the analysis results due to the test procedure. Measurements were taken by an FMS^{TM} certified specialist. During the measurements, first unilateral tests (deep squat, trunk stability push-up) and then bilateral tests (hurdle step, in-line lunge, shoulder mobility, ASLR, trunk stability push-up, rotary stability) were applied. Right and left were scored separately in bilateral tests and the lowest point was recorded as a score. Each movement was scored range between 0 and 3 point. FMS^{TM} composite score was obtained by summing the scores from each test. The maximal composite score was 21 points (Gray Cook et al., 2006). Individuals with an FMS^{TM} composite score below 14 points were found to have a higher risk of injury than individuals with a higher than 14 points (Kiesel et al., 2007). Excellent reliability was reported for this test (ICC=0.89) (Onate et al., 2012). For each group's testing session, the same researcher evaluated the FMS^{TM} test for all participants.

Data analysis. Data analysis was performed using Sigma Plot 11.0 (Systat Software, Inc., San Jose, USA) software. The normality of the data distribution was determined by the Shapiro Wilk test. Descriptive statistics were presented as mean, standard deviation, minimum value, maximum value, and 95% confidence interval (CI). Paired t-test was applied to determine the difference between the participants' dominant and non-

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dominant side balance tests. The relationship between FMS ^{TM} with static and dynamic balance was determined by the Pearson correlation test. Correlation coefficients were interpreted as 0.0=little or no correlation, 0.2 to 0.4=fair correlation, 0.4 to 0.6=moderate correlation, 0.6 to 0.8=high correlation, and above 0.8=very high correlation. The significance level was accepted as 0.05.

Results

The mean age of the bodybuilder (n=12) participating in the study was 29.7±7.5 years, sports age 7.0±4.2 years, body height 174.9±4.8cm, body weight 80.0±11.5kg, body mass index 26.1±2.7kg.m^{-2} and weekly training time 5.3±1.0 hours (Table 1).

Table 1.

Characteristics of the bodybuilders

	Mean±SD	Max	Min	%95 CI
Age (years)	29.7 ± 7.5	46.0	23.0	25.5 – 33.9
Years of experience (years)	7.0 ± 4.2	15.0	1.0	4.6 – 9.4
Body height (cm)	174.9 ± 4.8	187.0	169.0	172.2 – 177.6
Body weight (kg)	80.0 ± 11.5	102.4	70.0	73.5 – 86.5
Body mass index (kg.m^{-2})	26.1 ± 2.7	32.3	23.4	24.6 – 27.6
Weekly training time (hours)	5.3 ± 1.0	7.0	4.0	4.7 – 5.9

SD: Standard deviation, Max: Maximum, Min: Minimum, CI: Confidence Interval.

Static and dynamic balance descriptive statistics of bodybuilders and comparison of dominant and non-dominant side in balance performance are presented in Table 2. The static balances of the participants were not significantly different between the dominant and non-dominant sides (p=.250, diff=-2.0). However, six of the participants could not perform the test because they could not even take the starting position required for static balance. ANT reach distance (cm, p=.025, diff=-2.5) and ANT maximum reach percentage (%, p=.012, diff=-2.9) in lower extremity dynamic balance were significantly different between dominant and non-dominant sides, while SL reach distance (cm, p=.020, diff=-4.8) and SL maximum reach percentage (%, p=.018, diff =-4.8) in upper extremity dynamic balance were significantly different between limbs.

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Table 2.

Comparison of dominant and non-dominant side balance performance of bodybuilders

	Dominant		**Non-dominant**			
	Mean ± SD	%95 CI	Mean ± SD	%95 CI	p	Diff
Static balance (no of falls,n=6)	12.2±2.5	10.2-14.2	10.2±3.7	7.2-13.2	.250	-2.0
Dynamic balance YBT-LQ						
ANT (cm)	82.2±8.8	77.8-87.8	84.7±7.3	80.6-88.8	.025	-2.5
PM (cm)	94.3±11.2	88.0-100.6	93.7±13.1	86.3-101.1	.729	.7
PL (cm)	85.8±11.4	79.4-92.3	86.8±16.9	77.2-96.4	.754	-1.0
Max % ANT	88.4±9.4	83.1-93.7	91.3±7.3	87.2-95.4	.012	-2.9
Max % PM	101.5±11.6	94.9-108.1	100.9±13.3	93.4-108.4	.724	.6
Max % PL	92.4±12.0	85.6-99.2	93.6±17.8	83.5-103.7	.766	-1.2
Composite score	94.1±9.5	88.8-99.5	95.3±11.8	88.6-102.0	.490	-1.2
YBT-UQ						
Medial (cm)	100.1±6.7	93.3-103.9	100.3±6.4	96.7-103.9	.911	-.2
IL (cm)	73.7±14.6	65.4-82.0	74.2±19.6	63.1-85.3	.863	-.5
SL (cm)	52.8±11.1	46.5-59.1	57.6±10.5	51.7-63.5	.020	-4.8
% Medial	100.4±9.0	95.3-105.5	100.7±9.8	5.2-16.2	.850	-.3
Max % IL	73.9±14.9	65.5-82.3	74.1±18.6	63.6-84.6	.937	-.2
Max % SL	53.0±11.9	46.3-59.7	57.8±10.8	51.7-63.9	.018	-4.8
Composite score	75.8±9.8	70.3-81.3	77.5±10.3	71.7-83.3	.055	-1.8

SD: Standard deviation, CI: Confidence Interval, Diff: Difference. ANT: Anterior, PM: Posteromedial, PL: Posterolateral, IL: Inferolateral, SL: Superolateral, Max %: Maximum reach percentage.

The descriptive statistics of FMS^{TM} tests of bodybuilders are presented in Table 3. In bodybuilders during the definition period, the mean FMS^{TM} score is 12.7±2.0, the highest score is trunk stability push-up with 2.25±0.96, and the lowest score is rotary stability with 1.42±0.52.

Table 3.

FMS^{TM} test scores of bodybuilders

	Mean ± SD	Max	Min	%95 CI
Deep squat	2.1±0.5	3.0	1.0	1.8 – 2.4
Hurdle step	1.6±0.5	2.0	1.0	1.3 – 1.9
In-line lunge	1.9±0.5	3.0	1.0	1.6 – 2.2
Shoulder mobility	1.8±0.9	3.0	1.0	1.3 – 2.3
ASLR	1.8±0.6	3.0	1.0	1.5 – 2.1
Trunk stability push-up	2.3±1.0	3.0	0.0	1.7 – 2.9
Rotary stability	1.4±0.5	2.0	1.0	1.1 – 1.7
FMS TM composite score	12.7±2.0	16.0	9.0	11.6 – 13.8

SD: Standard deviation, Max: Maximum, Min: Minimum, CI: Confidence Interval.

The relationship between the participants' FMS^{TM} test score with dynamic balance composite scores and static balances is presented in

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Table 4, separately on the dominant and non-dominant sides. There was a significant negative relationship between dominant leg static balance and rotary stability (r=-.832, p=.040, very high correlation), and a significant positive relationship between dominant and non-dominant leg dynamic balance and rotary stability (dominant side: r=.589, p=.044, moderate correlation, non-dominant side: r=.775, p=003, high correlation). There was no significant relationship between upper extremity dynamic balance composite scores and FMS^{TM} scores on both sides of bodybuilders in the definition period.

Table 4.

The relationship between balance and FMS^{TM} test scores in bodybuilders

	Static balance				YBT-LQ				YBT-UQ			
	Dominant		Non-dominant		Dominant		Non-dominant		Dominant		Non-dominant	
	r	p	r	p	r	p	r	p	r	p	r	p
Deep squat	-.127	.810	-.085	.872	.165	.609	.337	.284	-.117	.718	-.132	.682
Hurdle step	.074	.890	-.541	.267	.204	.525	.069	.831	.211	.511	-.009	.976
In-line lunge	-.625	.185	-.682	.135	.165	.609	.144	.655	.210	.510	.205	.523
Shoulder mobility	-.068	.898	-.758	.081	.151	.640	.064	.844	.328	.298	.141	.662
ASLR	.427	.398	.022	.967	.119	.713	.157	.626	.362	.248	.372	.234
Trunk stability push-up	-.033	.951	.374	.465	.311	.325	.547	.066	.426	.167	.419	.175
Rotary stability	-.832	.040	-.557	.251	.589	.044	.775	.003	.385	.216	.424	.170
FMS^{TM} composite score	-.077	.885	-.451	.369	.416	.178	.588	.044	.418	.177	.303	.338

Note: In this table, the relationship only between the "composite score" obtained from the dynamic balance tests and the FMS ^{TM} tests and FMS^{TM} score – for dominant and non-dominant sides- is presented.

The significant positive relationship between both PL reach distance and PL maximum reach percentage with rotary stability in dominant leg (respectively, r=.679, p=.015, high correlation, r=.673, p=.017, high correlation). In non-dominant leg, significant positive relationships were found between PL reach distance and PL maximum reach percentage with trunk stability push-up (respectively, r=.598, p=.040, moderate correlation, r=.598, p=.040, moderate correlation), rotary stability (respectively, r=.843, p=<.001, high correlation, r=.840, p=<.001, high correlation), and FMS^{TM} composite score (respectively, r=.652, p=.022, high correlation, r=.708, p=.010, high correlation). In addition, a significant positive correlation was determined between the non-dominant leg PL maximum reach distance and rotary stability (r=.717, p=.009, high correlation). In upper extremity dynamic balance, only a moderately significant positive relationship was determined between the dominant side SL maximum reach distance and hurdle step (r=.586, p=.046).

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Discussion

In this study, it was aimed to determine FMS^{TM} and balance performance in bodybuilders during definition period and to determine the relationship between them. There was a significant negative correlation between dominant leg static balance and rotary stability (r=-.832, p=.040, very high correlation) and a significant positive relationship between dynamic balance and rotary stability in dominant and non-dominant leg (dominant leg: r=.589 , p=.044, moderate correlation, non-dominant leg: r=.775, p=003, high correlation). There was no significant relationship between upper extremity dynamic balance composite scores and FMS^{TM} composite scores on both sides in bodybuilders during the definition period

The number of studies investigating FMS^{TM} and balance in bodybuilders is very limited. In a study, the average number of falls in the bodybuilding group was 9.2±2.38 in static balance compared to fitness group, in all other FMS^{TM} tests except trunk stability push-up, the fitness group had a higher score, while the bodybuilding group had a better performance in dynamic balance (Matuliunas, 2020). Although the static balance performance of the bodybuilders in the definition period in our research was found to be higher (number of falls: 12.2±2.5) compared to this research, it is quite remarkable that half of our athletes could not complete the static balance test because they could not take the static balance starting position. The inability of the athletes to complete the test may have been affected by many factors (maximized muscle volume, reduction of muscle glycogen sources and dehydration of the muscles) that Steele et al. (2019) and Steen (1991) also mentioned. Tafuri et al.(2016) compared FMS^{TM} scores of CrossFit athletes, bodybuilders and professional weightlifters and they have found that CrossFit athletes exhibit high symmetry of fundamental movement patterns. They have found the lowest FMS^{TM} scores in bodybuilders (CrossFit athletes: 15.2±1.7, weightlifters: 14.8±2.0, and bodybuilders 14.2±1.9). In bodybuilders, the highest score was found shoulder mobility 2.8±0.4, the lowest score was found rotary stability 1.8±0.4 and trunk stability push up 1.6±0.8. In our study, although the FMS ^{TM} score was lower in bodybuilders during the definition period, the highest score was found in trunk stability push-up with 2.3±1.0 and the lowest score in rotary stability with 1.4±0.5. Rotary stability seems to be a predictor with low scores for both studies. In our study, it is thought that the low FMS^{TM} score is due to the fact that bodybuilders are in the definition period.

Correlational studies between FMS^{TM} and balance in different sports disciplines show different results. A moderately positive correlation was determined between FMS^{TM} rotary stability with ANT (r=0.37-0.41,

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p<0.007) and PM reach distance (r=0.31, p=0.03) in intercollegiate athletes (Harshbarger et al., 2018). In team sport athletes, a positive correlation was found between FMS^{TM} composite score and dynamic balance (left leg and composite score, male: r=.447; moderate, female: r=.446; moderate) (Kramer et al., 2019). As a result of this research, the authors reported that these two tests can evaluate similar fundamental structures such as dynamic balance and movement coordination. A moderately positive significant relationship was found between FMS^{TM} score with dynamic balance (r^2=36.24, r=0.602, p=0.001) and static balance (r^2=19.62, r=0.443, p=0.001) in adolescent volleyball players (Arazzadeh & Norastch, 2018). In another study, mean FMS^{TM} score was 14.1±2.1, non-dominant dynamic balance 71.4±9.1 and dominant balance 68.9±7.4 in elite volleyball players, but no significant relationship was found between FMS^{TM} and dynamic balance (Pourheydari et al., 2018). But in the research, they showed sample size as a limitation. A significant relationship was found between trunk stability push-up and right leg PM reach distance (r=0.37) and left leg in-line lunge and left leg PM reach distance (r=0.46) in team athletes (Lockie et al., 2015). In a study conducted with soldiers, better performance on FMS^{TM} composite scores was associated with greater ANT reach distance on the YBT (r=0.49, p=0.001) (Teyhen et al., 2014). In our research, it is remarkable that there is a significant relationship between both static balance and dynamic balance performance and rotary stability test. Whether this finding is specific to the discipline of bodybuilding should be clarified by further research. Cook et al. (2014b) stated that the rotary stability test is a complex movement characterized by multi-planar trunk stability, in which upper and lower extremity movements are combined and appropriate neuromuscular coordination is required. The fact that this movement with high neuromuscular coordination has a very low score in the definition period suggests that other coordinative and core tests should be added to the evaluation of athlete performance in addition to the FMS^{TM} test.

Most of the studies sought to answer the following question: Could FMS^{TM} and dynamic balance be predictors of injury? The study comparing whether there is a difference between FMS^{TM} and dynamic balance in soccer players with and without injuries shows that only the dynamic balance ANT reach distance is significantly different between the groups (p=0.035), while FMS^{TM} does not differentiate between the injured and non-injured groups (Morrell, 2012). In FMS^{TM} and balance studies, which predict injury risk and in injured athletes, hurdle step, deep squat and ASLR were emphasized as primary determinants of composite FMS^{TM} score (Armstrong & Greig, 2018). In another study, it was determined that the FMS^{TM} score increased with age in athletes in different age categories, but

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the dynamic balance test did not change, and it was recommended to apply the FMS^{TM} test for the risk of injury (Lisman et al., 2018). The remarkable finding in another study is that the FMS^{TM} composite score (12±4) obtained in soccer players who had ACL rupture and reconstruction 2 – 3 years ago and is now cleared to play is similar to the score we found in bodybuilders during the definition period (Oleksy et al., 2021). In addition to these studies, it has been reported that a low FMS^{TM} score (<14) in professional soccer players has a much higher risk of a serious injury (with specificity of 0.91 and sensitivity of 0.54) (Kiesel et al., 2007). However, Cook et al. (2014b), the founder of the FMS^{TM} test, has a very different view on this issue in their research. Cook et al. (2014b) specifically reported that although a total FMS^{TM} score below 14 predicted high injury risk, a score above 14 did not include low injury risk. They emphasized that strength and conditioning coaches should not neglect other screenings and tests that are specific to the sports discipline and affect athletic performance in the assessment of the injury risk of athletes.

Another test used as a predictor of disability is the dynamic balance test (Chimera et al., 2015; Marcus Lee et al., 2017). Studies show that ≥4cm ANT reach difference in YBT-LQ balance test increases the risk of injury in collegiate athletes (Smith et al., 2015) and composite reach score of ≤89.6% is a predictor of non-contact lower extremity injury in collegiate soccer players (Butler et al., 2013). In the light of these findings, it is accepted that the participants are not at risk of disability with the YBT-LQ balance test scores (ANT reach distance=2.5cm, composite score=94.1) we obtained in bodybuilders in the definition period. However, the FMS test scores of the athletes do not confirm this result. In a limited number of YBT-UQ studies, composite reach score was 84.5±8.3% of limb length in healthy adults (Gorman et al., 2012). In our study, the YBT-UQ composite score of bodybuilding athletes was found to be 75.8±9.8, which is quite low compared to healthy adults.

Conclusion

In recent years, it is seen that the use of screening tests that can determine the injury risk of athletes has increased. Two of these screening tests are FMS^{TM} and balance tests (usually YBT-LQ). Although the number of studies investigating FMS^{TM} and balance performance in different sports disciplines is high, the number of studies examining the relationship between these tests is very few. Additionally to the best of our knowledge, no study to date has directly evaluated a relationship between FMS^{TM} and balance in bodybuilders especially during definition period. Thus, we hypothesized that FMS^{TM} and balance performance were low in

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bodybuilders during the definition period and that there would be a significant relationship between them. In this study, FMS^{TM} composite scores of bodybuilders in the definition period were below the injury risk limit value (=12.7±2.0), but the YBT-LQ performance was within normal limits according to the literature. In addition, in bodybuilders during definition period, the highest score was in trunk stability push-up with 2.3±1.0 and the lowest score in rotary stability with 1.4±0.5. Rotary stability seems to be a predictor with low scores in parallel with previous research. Although there was no significant relationship between upper extremity dynamic balance composite scores and FMS^{TM} scores on both sides of bodybuilders during the definition period, a very low YBT-UQ composite score was detected. It is a very remarkable finding (50% of the participants) that bodybuilders in the definition period experience limitations in their neuromuscular coordination and trunk stability so much that they cannot even take the static balance starting position. Further studies are strongly recommended to clarify the this issue. The biggest limitation of this research is the sample size. Further research is also recommended to investigate FMS^{TM} and balance performance in female bodybuilders and/or different training period (such as bulking or cutting phases). As a result, the FMS^{TM} score is quite low in bodybuilders during definition period, and the increase in static and lower extremity dynamic balance performance may increase the rotational stability score. Bodybuilders are recommended to practice lower extremity static and dynamic balance exercises in addition to training during the definition period.

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Conflicts of Interest

The authors declare that they have no conflict of interest**.**

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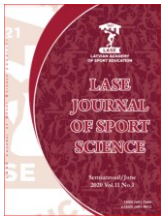

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ORIGINAL RESEARCH PAPER

LATVIAN FOOTBALL FANS ATTITUDES, INTENTIONS AND BEHAVIORS TOWARDS SPORT LICENSED PRODUCTS

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Abstract

The current research show first part of brand architecture and brand association, how are integrated to examine the role of the league brand on the relationship between the role of league brand consumer's support for individual teams is important for the successful management and marketing with licensed products of both leagues and teams. As this paper will show, professional sports teams unite to produce a league product that, while initially produced to provide entertainment for spectators, is now sold to four distinct groups: fans, associations, communities, and corporations. Justification and aim of the study. Income from licensed products is considered particularly important for football teams survival around the world. To date the research on the perceptions of sport team fans on the licensed football team products is scarce and particularly in the Baltics countries. In this line the present study was set to investigate the purchase intentions and behaviors towards licensed products as well as perceptions of experience, aesthetics and word of mouth for Latvian football fans. Material and methods. A self-completed online questionnaire was used for the purposes of the research and a total sample of 54 football team fans in Latvia was collected. Descriptive statistics, including frequencies, percentages, means, medians, standard deviations were calculated, Cronbach's α coefficient was also used to explore the reliability of the constructs. The analysis was run using the statistical program SPSS. Conclusions. The results revealed average purchase intentions and experience from the licensed products, while aesthetics and word of mouth

were evaluated higher. The majority of the participants had bought licensed products of their favorite team. This study contributes to the existing theory and offers practical implications particularly for football teams that aim to increase their income by investing in the licensed merchandise.

Key words: *sport brand management, football league brand, sport branding, sport team licensed products, Latvian football consumers, football fan wishes, purchase behavior towards licensed products.*

Introduction

The main goal of football clubs is to win the game, success in sports is the focus of Latvian clubs, to take this process better is the focus of Latvian football league. Today, however, the business and management components have grown exponentially and are increasing their level of impact on on-site success. A modern football club is an organization that is able to combine high sporting and administrative efficiency with an entrepreneurial spirit and environmental awareness of stakeholders, general scheme of management of football clubs.

Since there are few theories related to the football industry, an empirical approach is mainly used, and the so-called deduction point of view was used in the secondary stage. Most of the currently existing differences of opinion between scientists show how complex and scientific sense of fun is a brand-building process that helps organizations to acquire, or to highlight the advantage over other brands of sports organizations.

Economic revenues of the 5 best football leagues from match day revenues in the first half of 2023 earned approximately 50.1 billion euros, 11.3 billion were from licensed product sales, services and other products were written higher. The licensed products market is very important for football Leagues, teams, and brand building (KPMG football benchmark, 2023).

However, the task of today's sports marketers is to maintain this high demand due to competition between professional sports teams, leagues and other leisure activities, the emergence of new technologies and the increased popularity of broadcast social resources and products. As a result, the professional soccer industry becomes more complex and unpredictable, forcing club marketers to develop effective strategies to motivate spectators to attend games, buy memberships, and purchase team products and services. And this ascribed to each sport team fans affiliation with their favorite sport entities or teams and the emotions develop towards, which then lead to the purchase of league or team licensed products (Aquilina et al., 2012).

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Team success is important to football fans and has an emotional impact. This translates into increased engagement, spending on merchandise and brand engagement, as well as how the fan feels about himself. However, other values are also important for football brands. These are the nostalgic meaning, social entertainment and community role and values that the brand stands for.

These days, a product or a service is almost irrelevant without the brand. It cannot be identified or associated with what influences in fact our purchasing process. It is the overall effort of a brand identity that actually determines success or failure; and a better understanding of it and its result, namely the brand image, is an important matter.

Some of the problems identified are the complex processes of testing, designing, evaluating, and comparing brand identities. Consequently, a simple brand identity framework will be created tested and compared to an existing brand identity blueprint. When speak about identity and image management, we discover a high degree of unpredictability, uncertainty and a creativity factor added to the management lines. In order to have consistency within the company, it is the best situation to reduce risk and doubt associated with certain departments by the skeptical entities that are involved. In the process of building a brand identity, more important an active brand identity, we prefer to have certain guidelines or frameworks in order to do it right from the first attempt. As we all know, according to Lord Kelvin: "what can be measured can be improved". Considering this, having the dimension of the impact of the general brand identity on a consumer's perception, we can increase predictability, reduce risk, and increase efficiency from the beginning of the development of a brand.

And also brand loyalty is one of the main objectives of marketing, due to understanding the relationship between the team brand and team-related behavior was partially mediated by the league brand. Brand loyalty is one of the main objectives of marketing, due to understanding the relationship between the team brand and team-related behavior was partially mediated by the league brand. The explanation of how this type of loyalty is built in the sports industry is complex, due to the way it is organized. Traditionally, brand loyalty in this industry has been explained by satisfaction, service quality, commitment, and trust, thus other variables that have been analyzed from the marketing field have not been included in the models developed for the sports industry. Brand loyalty is one of the main objectives of marketing, due to its impact on the sustainability of organizations, however, the explanation of how this type of loyalty is built in the sports industry is complex, due to the way it is organized.

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When developing marketing strategies to develop these brands, football marketers need to take into account the values that are important to fans. In addition, they should be aware that they vary from club to club, with some clubs focusing more on football as a social pastime and others with a stronger emotional response. How professional sports leagues provide a unique environment for marketing decisions and processes to occur, in a number of markets and at a number of levels and should continue to be a growing segment within the broader, global, entertainment industry.

In England, the birthplace of the sport, exponential growth in interest means around 20% of all adults play football regularly (The FA 2022). Furthermore, in places where it is not the most popular sport; take for example the U.S.A, it is continuing to increase in popularity. In the United States, a precipitous rise in young persons' involvement has seen the number of registered US youth players surpass three million (US Youth Soccer 2021). In Australia, the game has seen rapid growth over a short period of time, and has surfaced as the most engaged in activity, surpassing more traditional and indigenous sports (Australian football federation, 2022).

In Latvia, the sport of association football has been played for over a century now. From a supporter standpoint, ice hockey and basketball results remain the major competitor for football, with both sports boasting a long history and tradition in Latvia. Ice Hockey and basketball, however, can claim a more prestigious and successful existence now in a sport team game.

At the end of 2009 Latvia was ranked 45th of all World national football team within FIFA according to club coefficients (FIFA, 2023), whereas it ranks in best 10 globally at Ice Hockey (IIHF 2023) and in 30 best teams in Basketball (FIBA, 2023). And popularity of this kind of sport also shows our famous players, like Kristaps Porzingis or Bertans brothers in basketball (NBA, 2023) or Zemgus Girgensons, Teodors Bulgers and Artūrs Silovs in ice-hockey (NHL, 2023). And hard to write the same about the football players who can popularize Latvian football in TOP 5 league, now only Raimonds Krollis play in Italian Serie A (LFF, 2023), but situation is changes and some young players more and more start playing in European TOP 5 league academies and also in Polish Ekstraklasa, Scandinavian countries or Ukrainian football leagues what is more strong than Latvian sport level of the league, what show us European football statistics (UEFA, 2023). And also, the national team of Latvia rank now only 134th, popularity of this kind of sport coming back what shows us statistic of attendance spectators on stadium.

Today Latvian football higher league is the10 football clubs, 180 games are held for one season, 300 players and thousands off followers,

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stakeholders who want to do League better. Which can interest more partners, and fans and increase the audience. Latvian professional sports teams unite to produce a league product that is produced to provide entertainment for fans, which support leagues by attending games, following event in real live, on television or other media, and purchasing league and team related merchandise. In figure 1 we can see basic dates: team city population, the club followers' quantity in the social world and fans attendance for each club of Latvian higher league.

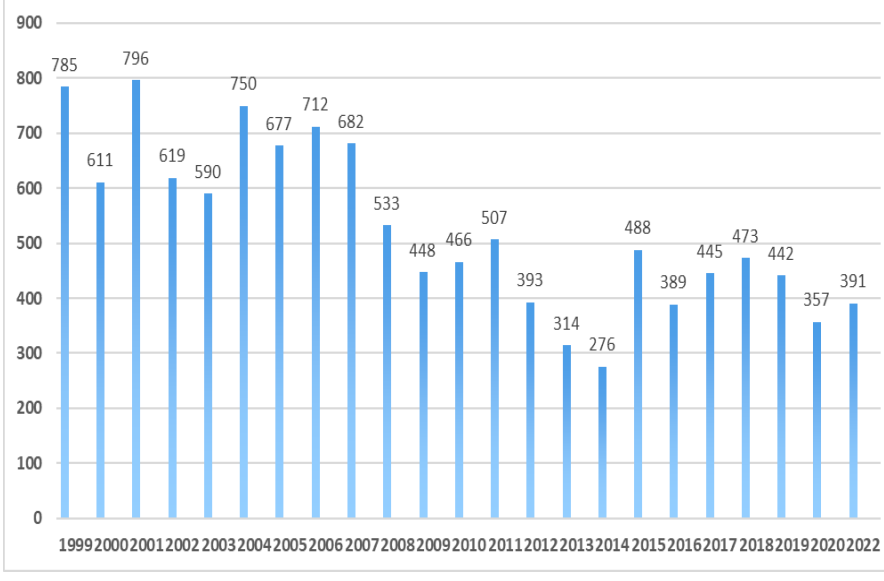

Figure 1. Optibet higher league fan average attendance (European football statistics, 2023)

The season 2019, LFV games were attended by an average of 440 fans, there were games where there were more than 3.000 people per game, but there were also games where the number of fans did not exceed 100 people. For the last 5 years, the situation has been changing and increasing, compared to the years 2013 – 2014, Figure 1 illustrates the situation and the number of fans of LFV in the last 20 years (European football statistics, 2019).

As this paper will show, professional sports teams unite to produce a league product that, while initially is produced to provide entertainment for spectators, is now sold to four distinct groups: first, fans who support leagues by attending games, following games on television and other media, and purchasing league- and team-related merchandise; second, associations – television and other media companies which purchase the right to show

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games as a programming option; third, communities which build facilities and support local clubs; and fourth, corporations which support leagues and clubs by increasing gate moneys, purchasing teams outright, or providing revenues through sponsorships or other associations. In addition, the aim of this article was to outline the discrepancies between segments of individuals comprising incremental levels of attendance regularity. The subjects of research were individuals living in Latvia. This research based thesis is supported with existing research relating to both sports fan motivational theories as well as branding.

Licensed product consumption and meanings. According to Keller, Parameswaran and Jacob (2011) brand licensing can be a very effective way for developing brand equity. In the sport industry it is estimated that revenues from licensed products sales will reach US$46.9bn by 2026 (Global Licensed Sports, 2018). Papadimitriou, Apostolopoulou, Branvold and Gargalianos (2020, p.530) have mentioned that "being able to identify those product meanings, consumers and incorporate them in sales campaigns can offer a competitive advantage to the sport property". Thus, estimating what these products means for sport consumers and at the same time the extent to which they are buying them, willing to buy them and word of mouth intentions are considered specifically important. Papadimitriou and Apostolopoulou (2015) developed the scale "Meanings of Sport Licensed Products (MSLP)" comprised of five (5) factors which measure the product meanings that sport consumers attribute to licensed products of their favorite sport team. These factors are experience, socialization, personal history, locality and aesthetics. Building on this framework and focusing on the factors of experience (to experience feelings and emotions connected to the supporting team) and aesthetics (to have fashionable and functional product), this study aims to explore purchase intentions and behaviors towards licensed products as well as perceptions of experience, aesthetics, and word of mouth for Latvian football fans.

Material and Methods

Research Setting, Data Collection and Sample. The sample of the present research consists of 54 football team fans based in Latvia. They were asked to fulfill an online questionnaire between December 2020 and February 2021. Table 1 shows the demographic profile of research sample. Most of the respondents are male (77.8%), almost half up to 45 years old (42.6%), full or part time employees (68.5%), hold a less than 4 year education degree (35.2%) or have fulfilled post graduate studies (37.0%).

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Table 1.

Demographic profile of the questionnaire respondents

Variables		***f***	***%***
Gender	Male	42	77.8
	Female	12	22.2
	Total	54	100.0
Age	18 – 24	12	22.2
	25 – 34	15	27.8
	35 – 45	23	42.6
	46+	4	7.4
	Total	54	100.0
Educational level	Secondary school	6	11.1
	<4 year education	20	37.0
	University degree	9	16.7
	Post graduate studies	19	35.2
	Total	54	94.0
Employment status	Full or part time employee	37	68.5
	Self-employed	6	11.1
	Un-employed	2	3.7
	Retired	0	0.0
	Student	9	16.7
	Total	54	100.0
f=frequency, *%*=percent			

Measures. The online questionnaire included of three main parts. The first included questions on the demographic profile of the sample (gender; age; educational level; employment status). In the second part respondents had to declare their favorite sport club and to show their purchase behavior. The last part included measures for four variables, experience, aesthetics (borrowed by Papadimitriou and Apostolopoulou, 15) and purchase intention as well as word of mouth (Apostolopoulou & Papadimitriou, 2018; Lee et al., 2007. A 7-point Likert scale was used for all measures (1 showing *"strongly disagree"* and 7 *"strongly agree"*. All measures were translated from English to Latvian following the back translation process.

Limitations and actions taken. The sample size is one limitation of the present study, despite the efforts of the authors to increase the sample size. Another limitation is the fact that the study is focused only in one country and one sport. Future research should include sport licensed products consumption from various countries and sports.

Statistical Analysis. For the analysis of the data the statistical program SPSS was used. Descriptive statistics, including frequencies, percentages, means, medians, standard deviations were calculated for all

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variables, followed by Cronbach's α coefficient to explore the reliability of the constructs.

Most of the respondents reported that their favorite sport is football club is Latvian national team (17.5%), followed by FC Barcelona (10.6%) and after Manchester United and FK Jelgava (7.2%). (see Table 2).

Table 2.

Favorite football team, purchases of licensed products and money spent

What is your favorite club?	*f*=frequency	%=percent
Latvijas Izlase	10	17.5
FK Jelgava	4	7.2
Manchester United	4	7.2
RFS	1	1.7
BJFK Jēkabpils	1	1.7
FC Real Madrid	3	5.3
FC Barcelona	6	10.6
FK Tukums 2000	1	1.7
FC Chelsea	2	3.6
FK Karosta	1	1.7
FC Bayern Munich	3	5.3
JDFS Alberts	3	5.3
SK Babīte	1	1.7
RIGA FC	3	5.3
FK Liepāja	1	1.7
Liverpool FC	1	1.7
AC Milan	1	1.7
Hertha BSC	1	1.7
Warsaw Legia	1	1.7
Spartaks Jūrmala	1	1.7
FK Zenit	1	1.7
PSG	1	1.7
FK Metta	2	3.6
Newcastle United	1	1.7
Arsenal	1	1.7
FK Ventspils	1	1.7
FK Valor	1	1.7
Total	57	100.0
In the past 24 months have you bought any licensed products of your favorite team?		
Yes	31	57.4
No	23	42.6
Total	54	100.0
How much money, on average, do you spend on sport licensed items with the logo/colors of your favorite team, in a typical season? (Mdn=11-50 euro) Mdn=Median		
less than 10 euro	12	22.2
11 – 50 euro	22	40.7
51 – 100 euro	12	22.2
101 – 150 euro	7	13.0
more than 151 euro	1	1.9
Total	54	100.0

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In addition, more than half of them (57.4%) had bought licensed products of their favorite sport team during the last 24 months. The amount that many (40.7%) of them spends on average on licensed products in a typical season is up to 50 euro (Mdn=11 – 50EUR), while 22.2% spend less then 10 euro and the same result while 22.2% 51 to 100 euro per season

Table 4 shows the means, standard deviations, medians and Cronbach's a coefficient of the dimensions of the meanings experience and aesthetics that the sample attribute to the licensed products of their favorite sport team and of the purchase intention and word of mouth. The Cronbach's a coefficient showed high reliability for all constructs.

Aesthetics was evaluated higher by respondents (M=4.78, SD=2.22, Mdn=4.83) and this shows that Latvian sport team fans focus on the characteristics of the licensed products. The second higher evaluated dimension was Word of mouth (M=4.65, SD=2.13, Mdn=5.00). Purchase intention (M=4.31, SD=1.90, Mdn=4.50) and experience (M=4.15, SD=1.98, Mdn= 4.50) were evaluated to an average extent.

Table 4.

Measurement items of MSLP scale constructs and materialism, means, standard deviations, medians, and Cronbach's alpha.

	M	***SD***	***Mdn***	***α***
Experience (MSLP Papadimitriou & Apostolopoulou, 2015)	*4.15*	*1.98*	*4.50*	*0.92*
Provide me with a sense of pride for myself	4.15	2.31		
Make me feel a stronger attachment to the team	3.54	2.16		
Give me a feeling of warmth	4.33	2.13		
Help me enjoy the games of my favorite team	4.04	2.18		
Aesthetics (MSLP Papadimitriou & Apostolopoulou, 2015)	*4.78*	*2.22*	*4.83*	*0.93*
Are attractive items	4.09	2.21		
Have the logo/colors of my favorite team	4.43	2.13		
Have nice design	4.59	2.25		
Word of mouth (Apostolopoulou & Papadimitriou, 2018; Lee et al., 2007)	*4.65*	*2.13*	*5.00*	*0.93*
to tell positive things to other people about your favorite team's licensed products?	4.56	2.08		
recommend your licensed team's licensed products to someone you know?	4.39	2.02		
encourage friends and others to buy licensed products from your favorite team?	4.41	2.01		
Purchase intention	**4.31**	**1.90**	**4.50**	**0.88**
consider a licensed product from your favorite team as your first purchase choice in the near future?	3.57	2.02		
continue to buy licensed products from your favorite team?	4.48	2.06		
still buy a product licensed by your favorite team, even if the product licensed by another team is cheaper?	4.87	2.27		
M=Mean, SD=Standard Deviation, α=Cronbach's α, Mdn=Median, 7-point Likert scale				

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Discussion

The aim of this research was to explore the purchase intentions and behaviors towards licensed products as well as perceptions of experience, aesthetics, and word of mouth for Latvian football fans. The results revealed that most of the respondents had bought at least one licensed product of their favorite football teams within the last two years. However, the amount spent emerged very low. Football clubs need to implement strategies in order to promote these products and increase the frequency of the purchases as well as the amounts spent by sport consumers. Increasing word of mouth and experience received by sport consumers will help in this line. What is more the results showing the importance that sport consumers attribute to aesthetics. Marketing managers should take into account that football team fans in Latvia consider licensed products appearance.

Conclusions

The findings of this research contribute new knowledge by empirically demonstrating that characteristics of the league brand have an influence on team-related behavioral intentions. The results showed that sports branding concepts by macro level analysis revealed that in the literature dominates two main provisions: some theorists consider an activity designed to create, maintain or change people's attitude towards certain sports and others think that it designs the development, planning and communication delivery name and identity to form and manage reputation. Sports brand-building models are not sufficiently detailed and informative, limited amount of the factors analyzed often impose finite sports brand-building actions that leads to sports brand-building model incompleteness and limited practical use.

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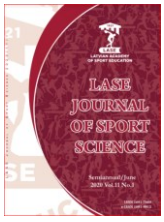

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REVIEW PAPER

PROFESSIONAL ETHICS FOR FITNESS TRAINERS

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Abstract

This article is only the first step in exploring the professional ethics of fitness trainers in Latvia. Marking the discourse, looking at the theoretical frameworks and concepts, and identifying the situation are its basic elements. The next stage will be the analysis of information about the experience in other countries and primarily the Baltic countries, their comparison, discussion, conclusions, and suggestions for a more successful practice of professional ethics. Professional ethics for fitness trainers constitute a part of their professional competence, which shapes, determines and evaluates their professional activities from the perspective of ethical attitudes. The profession of a fitness trainer reflects health as a fundamental value, which sets the meaning of their professional activity as one that promotes and maintains health. This article examines the basic elements of professional ethics of fitness trainers. Their presentation in a single and logically structured form is an innovation in the literature on fitness trainers. Providing this type of information to future fitness trainers in Latvia is not only a necessary but also an urgent task. The article discusses in detail the concept of health lifestyle, the basic behavioral health lifestyles that are characteristic of the Latvian population. Fitness trainers need this background information to better fulfil their function as educators. The aim of the study is to examine the current situation regarding codes of professional ethics and literature on professional ethics for fitness trainers and based on the literature analysis, to identify the main elements of professional ethics: levels of moral regulation, basic principles of ethics, codes, the issue of responsibility, tolerance and autonomy, trainer-client relationships, as well as the trainer's relationship with other professionals.

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The article also examines the types of normative ethics (deontological, utilitarian, virtue ethics) required for ethical decision-making.

Key words: *health, professional ethics, values, ethical principles, codes.*

Introduction

Sport, in all its forms, is a universal phenomenon. Character formation is linked to more than just the socialization process. People with a well-developed character can make independent choices and judgements and are endowed with willpower. Sport undoubtedly contributes to the development of character. Character traits such as determination, cooperation, willpower, endurance, courage, self-restraint, perseverance, and loyalty are among those mentioned most often as such that can be trained and developed through the challenges of sport. The concept and practice of sport are linked to commonly accepted concepts, ethical principles, and moral values.

For fitness trainers, just as for other professionals, it is essential to observe standards of professional activity and behaviour that define and at the same time help to achieve professional goals in the context of the client's interests. In other words – to become a successful professional in their chosen field. In order to achieve this, it is necessary to have sufficient knowledge not only of the profession in which they specialize, but also of professional ethics and the ability to apply them in practice.

Theories of normative ethics. Fitness trainers inevitably must deal with ethical issues in their professional activities. Moreover, the issues are always specific to the context and the individual nature of the situation. Often these are questions that need to be answered not in general terms of "What should I do?" but rather "What should I do in this particular case to meet the interests of this patient/client?" This means that they must seek answers to specific questions that are related to ethics. In order to accomplish this and to respond with appropriate solutions, fitness trainers should respond with ethical judgements based on ethical theories. In this situation, ethical theories are useful in offering a multiplicity of responses to the inevitably new, ethically problematic situations.

Is ethics in sport just a matter of following the rules and applying them fairly? There are a number of important questions with difficult answers that can help to illustrate the relationship between sports and morality. In the search for solutions to questions and ethical considerations related to sport ethics, it is important to clarify the main moral theories that are an essential supporting tool.

Normative ethical issues do not seek to describe the situation precisely, but rather to determine how a given situation should be handled.

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The essence of a normative ethical response is revealed in the desire to evaluate and recommend; not to make people more ethical, but to help people make better decisions. Normative ethical theories seek to explain what principles, reasons and values should guide our actions in specific sporting situations. Several types of approaches can be distinguished in dealing with normative issues. With regard to the question "What is the morally right thing to do?" we can answer it in a number of different ways, depending on the theory we choose. On the one hand, this creates the opportunity to ask additional questions about the situation of interest; on the other hand, by offering a variety of possible answers, it makes it possible to choose the most appropriate solution.

There are more types of ethical beliefs than can be listed in a single article. This paper will highlight three normative ethical theories which, when used alone or in combination, can provide a multifaceted analysis of dilemma situations.

One of these is *virtue ethics*, which emphasises the need to focus on the good throughout life. Here, the basic ethical question is "What should I be as a human being?" What virtues of character should I develop and how should I live by them.

The second is *deontology*, which focuses on the quality of our actions. Here the basic ethical question is "What should I do as a human being?" What type of actions should be performed (or avoided)? The third, *teleology*, calls for maximising the good. Here the basic ethical question is "What kind of action would maximize human happiness?"

Each of these ethical beliefs is linked to a value system. "For virtue ethics, the good is the achievement of excellence in thought, action, and character. For Kant's ethics (as one of the most prominent examples of deontological ethics), human dignity and its central aspect, good will, are the most important (though not the only) values; and good will is primarily concerned with governing intentions – specifically those that determine one's life plans, which correspond to the categorical imperative. For classical utilitarianism, pleasure and suffering are the basic positive and negative values" (Audi, 2007, 120). Each of the ethical beliefs can play an important role in promoting the good life. Just as it plays an important role in the process of finding solutions to ethical dilemmas.

Deontology (*deontos*) is a Greek word meaning 'duty' and represents the view that the *means* justify the *ends*. In contrast, the Greek word *teleos* means 'purpose'. Thus, teleological moral theory holds that the *end* justifies the *means* (Schlabach, Peer, 2020, 186).

Deontological ethical theories focus on the characteristics of actions rather than their consequences. They ask what our moral obligations are in

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particular circumstances or under general rules of conduct. Basic moral duties are equated with rights and that which is good.

Teleological ethics is most commonly known as utilitarianism or consequentialism. As its name suggests, teleological ethics focuses on the consequences of actions and thus seeks to find the rules, principles and actions that produce the greatest balance of good and bad. If the consideration of such consequences is directed towards the good of the individual, we arrive at a position called 'ethical egoism'. If such consequences are assessed in terms of the maximum good for all concerned, the theory is called utilitarianism.

Utilitarian ethical theories focus mainly on the consequences of actions. It asks what action or rule creates the greatest balance between good and evil. It equates the morally good with some notion of pleasure or happiness.

Unlike normative, action-based theories, which focus on duty and consequences, virtue ethics centre around the character traits of the moral agent and the consistency of the associated behaviour (habit). "Virtue ethic theories argue that ethics should primarily promote the development of moral character. It is suggested that the cultivation of virtue and the pursuit of excellence in all its possible forms are essential to good character" (Morgan, 2007, XXV).

Moral regulation. Like any other professional activity, the actions of a fitness trainer are subject to moral regulation on at least three levels. At the lowest level, it is the *restraint*, or refusal to act in a way that does not comply with rules (submission to moral requirements). This is followed by the achievement of *uniformity* of action, thanks to which it is possible to predict moral behaviour. The unification of moral behaviour constitutes the ethos of the professional – a set of distinctive features of the profession, defined by values and norms, beliefs that have stood the test of time. Professionals must conform to these if they are to achieve certain professional goals.

And the highest, but also the most complex level of moral regulation is *coordination* – the harmonisation of relationships. At all three levels, moral knowledge is necessary, in particular a code of ethics, because it is the basis for restraint, unification and coordination. The professional's activity is therefore characterised by external parameters: a certificate, a licence, proof of education, etc., as well as internal parameters: internal moral regulators – self-criticism, self-discipline, self-respect, etc. Professional ethics for fitness trainers is specific in that it combines elements of several ethical approaches. It is essentially a motivational communication ethic, but on the other hand it is a leadership ethic, which requires the trainer to be an authority, to be a leader in the relationship with the client. This means that the fitness trainer is

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in fact playing a dual role: he respects the interests and needs of the client, but he is in the lead as far as choice of strategy and methodology is concerned. By analogy with the doctor-patient relationship, the fitness trainer is the person with professional knowledge, while the client is the layman (the person without such knowledge).

Ethics of communication. Any person or group that receives instructions from a certified fitness trainer is a client. Of course, people need to know their own body and their physical capabilities, but this does not necessarily mean the ability to appreciate and develop these capabilities. That is the trainer's field of activity, the relationship between the client and the trainer.

The treatment of the client by the trainer must first of all be legally correct. This means that the client is dealt with by a *certified trainer* who has the necessary professional knowledge, which is updated throughout his or her professional career. A fitness club cannot be a special interest club in the sense that it is a gathering of people who share a common interest, but do not have sufficient knowledge not to be detrimental to the parties involved. Namely the health of the client and the reputation of the trainer. Secondly, this attitude must be *psychologically acceptable*. For this to happen, the trainer must have good communication skills rather than sufficient ones. Otherwise, the motivational and educational function cannot be realised. Thirdly, attitudes must be *appropriate with regard to professional goals*. The trainer can define the objectives to be achieved only if he has information about the client's state of health obtained before the training. It is desirable to be clear about the client's needs and expectations, which will help to develop an appropriate and realistic training plan. Fourthly, the attitude must be *morally sound* in the context of the situation. This means that the client is responsible for the truthfulness of the information provided, for withholding relevant information or for assuming that information is true, thereby taking responsibility for his/her own health, safety and for defining and achieving the desired goals in the training process. The client is the first to suffer from incomplete information. It is the moral responsibility of the client to provide truthful information about himself, his state of health or any problems in this respect. "The client of a fitness club should independently monitor his/her own health and inform the staff in time if his/her health deteriorates" – such a requirement can be made of the client in the internal rules of the sports club, not only in the code of ethics (Tornado, 2023). The client is responsible for the observance of contractual obligations, the observance of the club's internal rules, moral commitments (promises, verbal agreements, etc.), decisions taken, actions and behaviour in general, if he is an autonomous

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person. The same honesty and responsibility that is expected of a client is also expected of the trainer.

Informed consent. In moral terms, this is a shared responsibility between two partners: the trainer and the client. Provided, of course, that the client is an autonomous person capable of *giving informed consent*. Autonomy is self-determination exercised by an adult, mentally healthy person. It means that a person is free to follow his or her own will, which in turn determines his or her behaviour. The next condition for autonomy is the ability to choose freely, i.e., to have a range of choices. Autonomy and freedom (freedom of choice) are correlative concepts. Thus, an autonomous person can be considered to be an adult whose behaviour involves a real choice between potential courses of action and an *understanding* of the consequences of the actions chosen (Seale, 1999). Respecting a person means recognising that another person is worthy of respect. In practical terms, this means taking into account the individual's gifts and potential for development; taking into account their opinions, choices and actions, provided this does not contradict the general rule that a mentally healthy person has the right to determine what is done with their body. As Joseph Raz points out: "In order for man to be autonomous, he needs to identify with and be loyal to his choices" (Raz, 2001).

Informed consent is conscious, obtained without deception or subterfuge (e.g., passing off what is desired as what is, or stating "We care about your figure"). In order to obtain informed consent, the client must be provided with a fairly wide range of information. Informed consent also covers data protection, i.e., the club commits to respect data protection as a privacy right of the customer. The professional is expected to respect the principle of confidentiality in terms of information and other data protection, the trainer must recommend dietary changes based solely on evidence-based opinions and guidelines for health reasons and the needs of the clients, regardless of any direct or indirect interest or benefit from the supplement company or other suppliers.

In order to obtain this informed consent, the information from the professional must be as complete as possible. As emphasised in the "97 Rules To Live By For Personal Trainers: A Code Of Ethics" – be so verbally thorough and descriptive in explaining your exercises that even a blind person can grasp the concept of what you expect them to do (Goodman, 2023).

Values and health lifestyles. The specific nature of the work of fitness trainers requires adherence to basic ethical principles as well as attention to value orientation issues. In the process of work, the values of the trainer are expressed through the active realisation of his/her values. It is important to

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take into account that fitness trainers have great influence over the value orientation of the individuals they work with. This is particularly important when working with young people, as it is important to pay attention to and contribute to the development of young people's value orientations.

An individual's health behaviour is strongly influenced by his or her value system, which also includes health. A value is a relatively stable notion that gives an existential understanding regarding what patterns of behaviour are more important or desirable, and which are less important or undesirable. The relatively stable structure of such perceptions, organised on the basis of mutual comparison, is a value system. The relativity of values stems from the fact that, over the course of life, an individual's value system gradually changes according to the experience and circumstances in which they find themself. At the same time, these changes are slow enough not to jeopardise the main function of the value system, namely, to serve as a frame of reference that determines people's attitudes, opinions, and actions. Existing values are closely linked to social, moral, economic, historical, political, religious, cultural and many other factors existing in parallel at a given time.

We tend to express man's, societies, and time's values in terms of judgement and determination, justification and choice, relationships, care for oneself (one's health) and the world. Values are what determine human behaviour. By pursuing or trying to pursue the values that are important to them, people express their attitudes about reality. Value orientation refers to an individual's active pursuit of various spiritual, material, vital or social values. An individual's concern (or lack of concern) for health is also an expression of an attitude based on existing values.

Fitness trainers need to be familiar with all basic health behaviour styles, and they must inform their clients about them, as well as find out which style is practised by the client. Data from the quality-of-life survey allow us to hypothesise that the Latvian population is characterised by five health lifestyles: not caring about their health (harmful lifestyle), minimally caring about their health, partially caring about their health, health-oriented lifestyle, and health-promoting lifestyle (Sīlis, 2010).

A health lifestyle promotes healthy behaviours that include physical activities and other parameters. The Fitness School, for example, sees it as the *mission* of a fitness trainer: "To contribute to the improvement of everyone's health and quality of life through strength training and a well-balanced diet" (Fitness School, 2023). The Fitness School singles out physical activity and nutrition among a wide range of health-promoting activities, self-critically acknowledging that there are many different factors that influence our overall health, but unfortunately not all of these factors are within our conscious influence and control.

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Myfitness club, on the other hand, sees it as its mission to inspire, motivate and support people who want to make their everyday lives more active and healthier through regular exercise and movement. Their mission statement underlines the essence of the health and fitness profession, which is also the core of professional ethics (Myfitness, 2023).

A health lifestyle includes a set of behaviours chosen by an individual, combining a variety of possible health behaviours: smoking or not smoking, alcohol consumption, sports and exercise, dietary advice and many other preventive and health-promoting activities. Abel, Cockerham and colleagues offer the following definition of health lifestyles: "Health lifestyles comprise the interrelated patterns of health behaviours, orientations, and resources through which groups of individuals respond to their social, economic, and cultural environments" (Abel, 1991).

It follows from the theory of health lifestyles that "health lifestyles can be broadly characterised as either positive or negative" (Cockerham, 2005, 56). However, such a general characterisation does not necessarily imply that they are homogeneous, i.e. consisting only of health-promoting or only of health-harming practices. The 'health behaviours chosen by a particular individual can have both positive and negative effects on the body and mind and, although the effects vary, they form a coherent pattern of health practices, i.e. a lifestyle' (Cockerham, 1997). The data from the study support this theoretical assumption: none of the five health lifestyles of the Latvian population exclude all harmful habits (e.g. daily smokers can be found among all lifestyles). However, none of the lifestyles is absolutely harmful to health, as each of them includes health-care activities and health-preserving or health-promoting activities (Sīlis, 2010).

Data (Sīlis, 2010) support this theoretical position: none of the five health lifestyles of the Latvian population exclude all harmful habits. However, none of the lifestyles is absolutely harmful to health, as each of them includes some health-preserving or health-promoting activities.

The only one of the five lifestyles with which a health and fitness professional in Latvia should not interact is the lifestyle called "Not taking care of your health". This lifestyle has the most pronounced harmful habits (risky use of alcohol, chronic smoking, etc.). Few of them engage in physical exercise on a short and occasional basis.

"Minimal health concerns" means that practitioners of this style have relatively few distinctly harmful habits, but also few health-enhancing activities. Almost a quarter of them exercise at least once a week or even every day for at least half an hour (Sīlis, 2022). It is clear from the style description that practitioners of this style work individually and rarely collaborate with fitness trainers. "Partial health care" – a controversial health

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lifestyle characterised by strong negative habits alongside quite strong health promoting activities. Half (50%) of the respondents said that they exercise for at least 30 minutes once or several times a week to the point of light breathlessness or sweating (Sīlis, 2022).

A 'health promoting lifestyle' corresponds to people in good health, who regularly take part in sports activities and have the fewest, but still present, harmful habits. Their habits are characterised by avoidance of illnesses, more prudent food choices and a greater emphasis on health-enhancing activities. 6% of respondents listed extreme physical exercise at least once a week as their typical leisure-time activity. Two thirds (67%) exercise once or several times a week for at least 30 minutes to the point of light breathlessness or sweating (Sīlis, 2010).

Colleagues are treated ethically as co-workers – professionals similar to fitness trainers who work as employers, doctors, physiotherapists and other allied health professionals. This is necessary above all for the client, so that each client can benefit optimally from all professionals.

Codes of ethics, their structure, meaning and functions. The meaning of codes is open to interpretation, but in any case, no professional can do without the regulations laid down in codes, since both codes and professional etiquette are the means by which professional ethics are implemented. A code contains a number of constant elements, which vary according to the type of code: codes of ethics for individual trainers or group trainers. It is a systematic set of principles of professional ethics that are consistent with the professional role of the fitness trainer and the fundamental objective of improving the health of the client, which is why both international and regional codes are in force. For example, in describing the code as a regulatory normative document, the World Anti-Doping Code (2015) states that it is sufficiently detailed to achieve full coherence on issues where a common approach is needed, but it is also sufficiently general in other areas to allow flexibility in how the agreed anti-doping principles are implemented. The code has been developed with respect for the principle of proportionality and human rights. This creates the opportunity to use the code as a guide for practical action.

Most often, the preamble to the code states the purpose for which the code is to be developed and the tasks that will be undertaken to achieve that purpose. And the core values that will be put into practice by adhering to the requirements of the code. For the most part, the code contains the main principles, the rights, and duties of the professional, the responsibilities, the conditions for compliance with the code, and perhaps sanctions for breaches of the code. In addition, accountability is attached to compliance with the principles as well as the rights and obligations. Professional associations shall

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supervise the establishment of and compliance with the codes. Codes are sometimes made up solely of principles, which are norms expressed in a generalised and/or prescriptive form. A code is therefore a set of principles in a systematic form. Principles also tend to be defined in law. For example, in Latvia, the four main principles that are relevant to sports are contained in Article 3 of the "Law on Sports":

1. *the principle of equality*, which states that everyone has the right to take part in sports.
2. *the principle of fair play*, which states that the educational, organisational and management of sports must be guided by the Olympic ideal and ethical principles, and must combat dishonesty and doping in sport, as well as physical and moral impropriety.
3. *the principle of safety*, which requires that sporting events are held in a safe environment and are organised and managed by qualified sports personnel.
4. *the principle of good governance*, which requires that the organisation and management of sport is based on democratic governance structures, clear objectives, fair procedures, openness, cooperation with stakeholders, effective and sustainable regulation, and clear levels of oversight and accountability (Law on Sports, 2002).

These principles can be applied to the professional activities of fitness trainers. The authors believe that *the principle of safety should be considered as a key principle*. And only then the principles of equality, fair play and good governance. Failure to comply with the safety principle may result in damage to the client's health, for which the trainer may be held legally and ethically liable. Respect for the principle of safety also implies the practice of the principle of non-harming. The IDEA Code of Ethics for Personal Trainers states that:

- the primary responsibility of the personal trainer is the safety, health and well-being of the client; never compromise this responsibility for self-interest, personal gain or monetary gain.
- products or services should be recommended only if they will benefit the client's health and well-being, not because they will benefit you financially or professionally (IDEA, 2023).

The fact that few codes of ethics are available in the public domain in Latvia does not mean that there are no regulatory codes of ethics. Latvia is a member of the European Register of Fitness trainers (EREPS, 2023), whose code is also binding for fitness trainers practising in Latvia. The code comprises four principles: rights, obligations, personal responsibility and professional standards. The principle of rights requires respect for individual differences, non-discrimination and non-disclosure of client information.

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Compliance with the principle of commitment requires that fitness trainers build and maintain relationships with clients based on openness, honesty, mutual trust and respect. Personal responsibility is primarily for the safety of clients, knowledge of the legal aspects of cooperation, high standards of personal and environmental hygiene, non-judgmental attitude to the use of illicit drugs or other prohibited performance-enhancing drugs. The professional standard requires active pursuit of knowledge and improvement of professional skills, a willingness to take responsibility and accountability for professional decisions or actions, to be responsible for maintaining the effectiveness of one's own performance and to work within the limits of one's competence.

But there are other types of codes, for example with regard to treatment of moral subjects, as well as relationship with clients, colleagues, business partners or club owners, and even society at the broadest sense. These attitudes emphasise the relationship of health sport to the health of society as a whole (as part of or as an independent entity).

Whatever the type, a code of ethics helps to understand how to deal with problematic or ambiguous situations, to find solutions to moral dilemmas. This is important when it comes to choosing a single guiding principle according to which a dilemma will be resolved. *Codes* are a means of shaping and developing a culture of communication and ethical attitudes. They have a significant impact on the opportunities to build a positive image of oneself as a good professional and of one's workplace. Codes also serve as a deterrent to conflicts of interest.

Professional etiquette. Professional etiquette is another means of implementing professional ethics. *Professional etiquette* is a set of rituals that are developed informally to maintain the overall facade of the profession in front of the public (Gofmanis, 2001). Its main task is to show fair treatment. It is to show that the whole training process is going according to plan or according to routine. The client requires an individual approach or a unique attitude even in the case of group training. In cooperation with individual trainers, this will be a personalised service which will always take into account the client's age, gender, physical condition and other parameters.

Professional etiquette plays an important role in the process of building trust between the client and the trainer, as the impression of competence must be given first and foremost. The first impression of a person, as psychologists have found, is formed in the first 90 seconds of contact. We also think of someone who is outwardly attractive as better, smarter, and more interesting than someone who is outwardly unattractive. The so-called 'oreola effect' is at work, which is manifested in the fact that in the process of forming a first impression, the overall positive impression

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leads to a revaluation of the partner, the negative impression – to a devaluation of the stranger (Omarova, 2002). These errors can be avoided in further communication if the professional's behaviour and manner of communication create a positive impression and the first impression of competence develops into the belief that competence exists and is manifested in all the criteria of competence. That is, the fitness trainer has the knowledge, skills, and abilities, as well as the ethical attitudes consistent with professional ethics.

The process of interaction will not automatically build trust if certain elements are not met. *The form of address should be agreed upon* with the client at the outset of the relationship. This is an important element for the self-esteem of any person. In languages where there are different forms of addressing people you do not know, especially if they are older than you are, and/or more respected, it is preferable to address them in the more formal manner until the regularity of training has been established over a period of time. And then, if the trainer himself is more comfortable with another form of address, the issue can be revisited again to find the most optimal option for both parties. Another element to be observed in the communication process is the way the information is presented. There are precise guidelines in the literature which can be reduced to the following findings:

- avoid complicated trainer jargon. Clients don't study it, clients don't understand it, it won't help them;
- information should be simple and clearly presented;
- when making critical remarks, use the sandwich method: first compliment them, then criticise, then compliment again;
- speak slowly when reviewing the terms of the contract with your client.

Building trust is a gradual and sometimes quite a lengthy process until the client finds "his trainer" – if you trust the trainer, he is the right trainer for you. A trainer is often chosen because the person needs psychological support, not so much practical support. They may need someone who will stand by, supervise, control, and motivate them. "One person needs a trainer to scold them, other needs someone to motivate, support and parrot them. Some people need a chum, while others need a role model, a psychologist, or a sensei. The main thing is to find the right one", says Ralfs Upmanis (Smilga, 2022).

Successful cooperation and even less successful communication will not happen if the trainer is unable to accept the personality traits of the other. Tolerance and respect are two closely related moral categories that work both ways: tolerance allows you to gradually arrive at respect, and vice versa. Joseph Raz describes this relationship in general terms, but it is fully applicable to the professional ethics of fitness trainers. To be able to work

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with a group one has to practise patience and tolerance. Tolerance means suppressing or restraining the inclination or desire to harass or embarrass another person, to harm them or to express an unwanted reaction. Tolerance is therefore the restraint of an action or desire that would be unpleasant for the recipient of that action. Within certain limits, respect for personal autonomy makes bad or evil behaviour tolerable (Raz, 2001). But you do not need be tolerant of any ethical violation by your client. This is defined more concretely by the internal rules of the clubs. For example, the internal rules of the "Myfitness" club state that in case of violation of the rules or rude behaviour, the staff has the right to ask the visitor to leave the premises of the club, as well as to impose a fine of 50EUR and/or to block the membership card for a certain period or to unilaterally terminate the membership contract. In these cases, the subscription fee or single visit fee is not refunded. The club has the right to claim full compensation for the damages suffered (Myfitness, 2023). Similar wording for non-compliance can be found in almost every fitness club.

Materials and Methods

The research material is basic literature in ethics, especially ethical codes. Method: philosophical reflection based on the analysis of literature.

Results

There is practically no professional ethics literature for fitness trainers in Latvian. The only book that has been used as a teaching tool so far is "Fundamentals of Professional Ethics" written by Aino Kuzņecova in 2003. The book "Fitness Philosophy and Practice" by Raisa Tarnopoļska (2008) focuses on practice, with only a few pages devoted to fitness philosophy.

A study of the codes available in the public domain in Latvia for health and fitness professionals shows that they are so few in number that it is impossible to carry out a comparative analysis.

It is much more common practice to include ethical requirements for trainers and clients in the internal rules of a club, which are only available on the club's website.

Discussion

The question of the image of the fitness trainers, what they should have and what role they play in dealing with different clients is a controversial one. For example, the IDEA Code of Ethics for group fitness trainers emphasises the requirement to model behaviour that values physical ability, function, and health above appearance: "Demonstrate a healthy behaviour and attitude towards the body (including your own)". Healthy behaviour is free from harmful habits and physically active, but is appearance

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irrelevant, can appearance motivate, perhaps demotivate? Does this mean that a fat trainer can also fit the image of a specialist, and thus motivate fat clients to take up active exercise?

The article "97 Rules To Live By For Personal Trainers" mentioned above emphasises the role of personality rather than image, which can excite clients, motivate them to emulate or be more enthusiastic: "Personality matters, always let your personality shine through in your training".

The Latvian Health and Fitness Association's "Code of Ethics for Personal Trainers", on the other hand, only briefly mentions that trainers should be well-groomed and dress appropriately. No additional requirements are given.

The basic psychology of communication should be taken into account, as should the importance of first impressions. The first impression of a partner is the regulator of the subsequent relationship and the communicative behaviour. The first impression is necessary to choose the optimal communication tactics for contacts with a given partner. And if the fitness trainer does not take care of the impression he leaves on others, with his posture, neatness, cleanliness, attentiveness to the interlocutor, the initial positive impression may fade away as if it were not there. But a pleasant impression does not automatically guarantee a successful future cooperation.

Conclusions

Normative questions regarding ethics should be included in the education of fitness trainers, thus equipping them with the necessary tools to make ethical decisions.

In the client-trainer relationship, both parties are obliged to commit themselves, so the shared responsibility between client and trainer prevails, but only if the client has been sufficiently informed and has given informed consent. In order to raise the level of professional ethics, it would be desirable for sports associations to be more active in the development and implementation of professional codes. There is dire need for a textbook on 'Professional ethics for fitness trainers.

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REVIEW PAPER

OUTDOOR PHYSICAL EDUCATION CLASSES IN THE EDUCATIONAL CONTENT OF LATVIAN AND FOREIGN SCHOOLS

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Abstract

In Latvia, the conduct of outdoor physical education classes is influenced by both the climate and the challenges of the learning process, therefore, conducting the physical education classes outside the school premises (outdoors) is a topical and challenging subject. The purpose of this literature review is to: 1) find out the benefits of organizing physical education classes outside the school premises (outdoors), 2) find out what is the regulatory framework of the outdoor physical education classes would be in general education schools in Latvia and abroad, 3) compare the status of Latvian and foreign outdoor physical education classes in the educational content of schools. Results: conducting physical education classes outside the school premises (outdoors) provides benefits in the following groups of benefits – learning benefits, health, environment. Compared to other countries, outdoor physical education classes in Latvia are possible, but not mandatory. There are countries where the status of outdoor physical education classes is lower, but in the Nordic countries (Finland, Sweden, Estonia, Norway) the status of outdoor physical education classes is the highest, and conducting such physical education classes is especially encouraged.

Key words: *outdoor classes, government, education system, PE curriculum*

Introduction

In the sources analyzed in this document, the term "outdoor PE classes" is defined differently – due to different approaches, understandings and practices, the nature of the analyzed documents, differences in research areas, countries, and cultures (Allison, 2017, Tortella 2021). The concept often includes learning outside the classroom, *udeskole, friluftsliv,* outdoor adventure activities, forest school, and generally speaking, outdoor school education can be described as teaching and learning, experiences that take place outdoors, in an out-of-school setting (Mall et al. 2017). In this study, the outdoor physical education class is defined as the conduct of school pedagogical activities in the outdoor, non-school environment, in the context of the ISCED 1 and ISCED 2 school physical education.

The expected benefits of "outdoor physical education classes" cover various fields and contexts (Waite 2015, Rickinson 2006), moreover, the need for the learning process outdoors is described not only by scientific publications, but also by the European Framework of Quality Physical Education guidelines, in which activities outside the premises and in nature are mentioned as a self-evident part of life. It should also be noted that in the Nordic countries, including Latvia, students spend a lot of time indoors in autumn and winter. The amount of time students spend on smart devices has significantly increased in recent years, for example, the PISA results of the international education assessment (PISA 2015) indicate the need for the most successful students to spend even 4 to 6 hours a day in front of a smart device screen.

On the one hand – the weather and the challenges of organizing and conducting outdoor physical education classes, also the increase in time spent on smart devices as a global trend, on the other hand - the desire of students to have outdoor physical education classes, the significant expected benefits and the support of such education, both in the educational content and in the European Framework of Quality Physical Education (EFQPE) supranational educational programm.

The purpose of this literature review is to find out what benefits are provided and what the regulatory framework is of the outdoor physical education classes in general education schools in Latvia and abroad.

Material and Methods

This is a theoretical study - a literature review. This review consists of two parts.

The first part was carried out with the aim of finding out the benefits of the physical education classes outside the school premises (outdoors). For this purpose, a review of information available online and in English was conducted using the umbrella review method ("Umbrella review", Pollock et

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al. 2020). Publication selection criteria: 1) publication period from 2000 to2022, 2) full online availability of the publication, 3) language – English and Latvian, 4) context – school physical education, 5) publication refers to the ISCED 1/ISCED 2 education stage. Databases used – Scopus, Google Scholar. Search keywords used: "outdoor" + "school", "outdoor" + "education", "outdoor" + "primary education", "outdoor" + "basic education", "outdoor" + "secondary education". The above words were used in the search, as the level of education covered by ISCED 1 and ISCED 2 is defined differently in different countries. The Eurydice report on educational attainment for 37 countries (27 European Member States, Albania, Bosnia and Herzegovina, North Macedonia, Iceland, Liechtenstein, Montenegro, Norway, Serbia, Switzerland and Turkey) mentions the keywords used (Eurydice: National Education Systems, 2022). From the found studies, the publications were selected that met the criteria described above (time of publication, availability, language, context, stage of education).

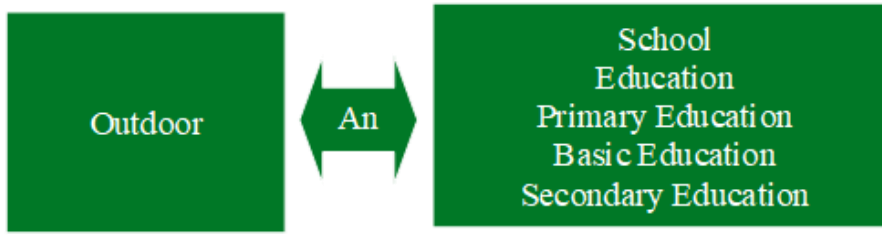

Figure 1. An illustration of the search string used for search for publications.

From all potentially relevant publications we selected publications that met all the eligibility criteria. 19 studies were thus selected. After analysing these studies, the benefits of conducting physical education classes outside the school premises (outdoors) were identified. If other scientific publications describing benefits were mentioned in the analyzed study, these publications were also included in the list of analyzed materials – without time and language restrictions. A further 6 studies were found in this way. The next step was the grouping of identified benefits. The expected benefits of outdoor physical education classes were described differently and covered significantly different categories. Therefore, an initial and repeated grouping of indications was performed. The number of obtained categories (combining them) was reduced by the agreement of the authors of the study.

For example, the physical and mental categories defined by Mall (Mall et al. 2017) were combined into one – health category; social competences, relationships were included in the learning benefits category. In this way,

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indicators were obtained for qualitative, substantive analysis in the second part of the study.

The second part of the study. In this part, an analysis of the regulatory documents of physical education in general education schools of 34 countries was carried out at the ISCED 1 and ISCED 2 stages of education (classes 1 – 7 of the schools in Latvia). The aim of the second part of the study is to find out what the regulatory framework of the outdoor physical education classes is in Latvian and foreign general education schools, and to compare the status of Latvian and foreign outdoor physical education classes in the educational content of schools. Country inclusion criteria - belonging to the European cultural space, geographical proximity, EU member states. Data was collected for 34 countries: The European Union (27 countries) and United Kingdom, Iceland, Russia, Liechtenstein, Norway, Switzerland, Turkey. Selection criteria of the analyzed documents: type of publications – 1) descriptions of the educational content of national schools, 2) a review of the hierarchically higher organization – Eurydice on the activities specified in the strategic documents, intended for the first stage of primary and secondary education (ISCED 1 and ISCED 2). Time period: 1) the latest available documents of the hierarchically higher, supranational Eurydice reviews, 2) current documents regulating the content of education (documents valid in 2022). The elements related to the conduct of outdoor physical education classes, the organization of physical education classes and other activities in the outdoor space were determined in the analysis of information. After determining these elements in the summary of results, indicators were grouped into four levels according to the importance of these elements in the analyzed document.

Figure 2. An illustration of included countries and documents used in analysis.

The data of 27 European Union member states and the United Kingdom, Iceland, Liechtenstein, Norway, Switzerland, Turkey were obtained from national education regulation documents and the Eurydice education review report (European Commission/EACEA/Eurydice report). The data of Russia was not included in this review report, therefore, in order to obtain comparable results, the content of school education regulatory documents was analyzed according to the Eurydice criterion "Activities specified in centralized educational content instructions or strategic

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documents intended for primary school education (ISCED 1) and the first stage of secondary education (ISCED 2)".

Results

The first part of the study analyzed the benefits of outdoor physical education activities. The obtained results show various significant benefits of outdoor physical education activities. In several analyzed studies, the authors have grouped these benefits. For example, Mall et al. have grouped the benefits as follows: 1) physical activity level of students, 2) mental health status, 3) social competences and relationships, 4) academic achievements (Mall et al. 2017). However, there are studies that describe the benefits in other categories due to different opinions. For example, Humberstone mentions the opportunity to move in nature, explore and experience natural places, visit remote places and wilderness (mountains, rocks, forests, lakes, rivers) as the educational benefits of outdoor activities, especially if the beauty, drama, wildness, and magnificence of nature is seen (Humberstone, 2001).

After summarizing the different visions and taking into account the context of school physical education, the authors of this study developed the following three groups of benefits in the framework of this study:

1. learning benefits - for example, the connection with the content of other learning subjects, the formation of a deeper understanding of culture, literature and art, the promotion of extracurricular physical education activities and nature-friendly attitudes (Hurych 2012), non-linearity and variability (Collella 2021), the requirements of the health and physical activity subject (Cabinet Regulation No. 747), students' positive assessment and desire to participate in outdoor physical education classes (Jansone et al. 2016),

2. health benefits - for example, health and environmental skills (Bowker 2007, Andrieieva et al. 2022), more attention to natural light (Hatori 2014), development of visual perception and promotion of vision-enhancing health habits (Tzu-Hsun Tsai 2017, Description of the study on pupil vision, University of Latvia), for optimizing sleep/wake rhythm and active mood (Hatori 2014, Ardahan 2012), lower risk of respiratory infections (Cabinet Regulation No. 662),

3. environmental benefits - for example, natural elements of various surfaces, textures, and shapes (Hurych, 2012), the possibility to diversify the content of physical education classes (Mutz 2016), economy of school premises and less noise pollution (European Agency for Safety and Health at Work – Factsheet 56, Cabinet Regulation No. 66).

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These groups of benefits were applied in the second part of the study with the aim of identifying the characteristics of outdoor physical education classes in the different understandings and forms of expression of different countries. The criteria used by Eurydice are close to most countries, but the form of such documents can differ significantly – for example, Latvian and Norwegian educational content guidelines.

The second part of the study. The descriptions regulating the content of school education in different countries are different both in terms of form and content. Other related documents and document attachments also regulate outdoor physical education classes. Below are the results of the study according to the status of outdoor physical education classes in the education regulation of each country, according to the criteria used in the Eurydice review report. The status of outdoor physical education classes was assessed at four levels (see figure explanation).

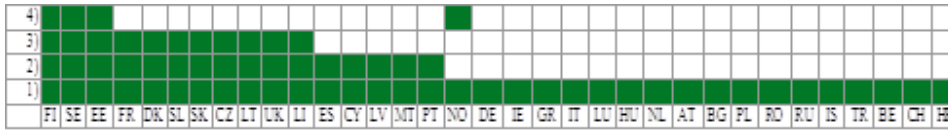

Figure 3. Outdoor PE classes in 34 countries: four levels of outdoor PE status.

Explanation of the figure:
Vertically – status of outdoor physical education classes:
1. outdoor physical education classes are possible,
2. the conduct of outdoor physical education classes is not mandatory, or it applies only to students of a certain age,
3. outdoor physical education classes are a mandatory part of the curriculum and apply to students of all ages,
4. additional programs have been created for learning the content of outdoor physical education classes.
Horizontally – country names (abbreviated):
FI-Finland, SE-Sweden, EE-Estonia, FR-France, DK-Denmark, SL-Slovenia, SK-Slovakia, CZ-the Czech Republic, LT-Lithuania, UK-the United Kingdom, LI-Lichtenstein, ES-Spain, CY-Cyprus, LV-Latvia, MT-Malta, PT-Portugal, NO-Norway, DE-Germany, IE-Ireland, GR-Greece, IT-Italy, LU-Luxembourg, HU-Hungary, NL-the Netherlands, AT-Austria, BG-Bulgaria, PL-Poland, RO-Romania, RU-Russia, IS-Iceland, TR-Turkey, BE-Belgium, CH-Switzerland, HR-Croatia.

The regulation of outdoor physical education classes in Latvia stipulates that the status of outdoor physical education classes corresponds to Level 2, which allows physical education classes to be organized outdoors, and outdoor physical education classes are not mandatory – elements that would require the organization of physical education classes outdoors, can also be organized in school premises.

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In the Baltic States, the status of outdoor physical education classes is determined as follows: Estonia – 4th, i.e. at the highest level, Lithuania – at the 3rd level (Lithuania) and Latvia – at the 2nd level.

The highest, or fourth status of outdoor physical education classes is held by the Nordic countries – the countries that are characterized by being similar to Latvia and with even greater autumn and winter (the coldest period of the year) weather challenges.

However, climate challenges do not mean the self-evident inclusion of these elements in school education.

The lowest or first status of outdoor physical education classes is in countries with significantly different climatic challenges. This group includes the southern countries – Turkey, Greece and Italy, as well as Russia and Iceland.

Discussion

Limitations of the first part of the study (examining the benefits of outdoor physical education classes): limitation of the publication period (from 2000 to 2022) and grouping of the identified benefits. The initial and repeated grouping of the expected benefits of outdoor physical education classes was done by agreement of the authors of the study. Such an approach is closely related to the context of this study, other studies may require a different approach.

Limitations of the second part of the study (comparison of different countries): availability of documents, information on related documents – documents regulating the educational content of schools in different countries differ significantly both in form and in content. Specific issues may be described in another document, which may not be mentioned in the main documents; a limitation is also a different understanding of concepts, different contexts.

For the purposes of this study, the above-mentioned limitations were solvable, as the main guidelines were also duplicated in the Eurydice report (except for one country – Russia). However, for future and practical studies, it is useful to supplement the study methods with the comments of experts from each country.

It is important to emphasize the following discussion topics:

1. access to data. The study showed a significant and institutionally solvable problem in educational research – access to data. There is no single database where school curriculum documents from different countries are available, and such documents are often not available in English. For example, the Cabinet Regulation No. 747, Appendix 8 (which describes the results to be reached in the area of health and physical activity education for grades 3, 6,

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and 9) will be difficult for an English-reading researcher to find on the Internet among many other publications related to educational content.

Therefore, a single database with English translations of all documents would be useful in educational research for access to educational regulatory documents of different countries. An explanation of document hierarchy, related documents is also needed. For example, the necessity of conducting outdoor physical education classes in Russia results from the regulation of school curriculum (Russia, description of school education content, 2021), but the conduct of physical education classes in relation to air temperature and humidity is determined by an approved table, which is part of the rules of the school agenda (Russia, sanitary norms in schools, 2010).

2. Regularity of reports. Possible inaccuracies in education research are also caused by breaks in the regularity of publications – although the educational curriculum documents of the schools of different countries have experienced significant changes in recent years, even the hierarchically higher reports (for example, the Eurydice report of the European Commission on physical education and physical activities in European schools) are not of sufficient regularity. This study used the Eurydice 2022 data and 2013 data. For example, in the case of Latvia, such report does not show any changes after the 2018 education reform. This is also a problem that can be solved institutionally.

3. Study context. The Nordic countries (Finland, Sweden, Estonia, Norway) have emphasized the importance of outdoor activities the most, and the expected type of activities (if related to the weather) is often related to the weather in the coldest period of the year – the period of the school year (autumn - winter - spring). For this reason, the comments of the authors of several studies about the lack of studies on outdoor physical education classes at school (Humberstone, 2001, Mall et al. 2017) are understandable, as many studies on the effects of weather, thermoregulation, thermal stress, link the challenges of outdoor physical education activities to other and irrelevant challenges for the period of the Nordic school year, such as heat (Konefal et al. 2020). Longitudinal studies on the benefits of outdoor physical education classes are also lacking (Mall et al. 2017).

Conclusions

The regulation of physical education classes in force in Latvia gives the opportunity to use the benefits of outdoor physical education classes in the pedagogical process of schools: physical education teachers may conduct physical education classes outside the school premises (outdoors, moreover, for the learning of several topics, it would be necessary to organize the physical education classes outside the school premises.

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The Nordic countries (Finland, Sweden, Estonia, Norway) promote outdoor physical education classes in a special manner – describing them both as a separate category and implementing various additional programs for outdoor physical education classes. There are no legislative obstacles for outdoor physical education classes in Latvia to be implemented at the level of the Nordic countries.

The Nordic countries have the highest or fourth outdoor physical education class status, that is, countries characterized by autumn and winter (the coldest period of the year) weather challenges. However, climate challenges do not mean the self-evident inclusion of these elements in school education.

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CONGRATULATION

We congratulate Behnam Boobani, PhD student at the Latvian Academy of Sport Education, who has defended his thesis "EFFECT OF OUTDOOR RECREATION ACTIVITY ON STRESS LEVEL AND MENTAL TOUGHNESS ON TAEKWONDO ATHLETES IN THE COMPETITION PERIOD" for obtaining the Doctoral (Ph.D.) Degree in the field of Health and Sports Science in the Sub-branch of Sport pedagogy at the Latvian Academy of Sport Education on June 15, 2023.

In this research, the author used three instruments to measure the stress level in taekwondo athletes. The instruments are the Stress scale of the DASS questionnaire, the Determination test, and the Gas Discharge Visualization. The research contributes to the body of knowledge in sports science by providing evidence for the potential benefits of incorporating outdoor recreation activity (walking in nature) in taekwondo athletes' training and performance during the competition period, it demonstrates the effectiveness of outdoor recreation activity in reducing stress levels and improving performance according to GAS theory, and Kellmann's scissors model which describes the relationship between stress, recovery, and performance, providing concrete strategies for reducing stress levels and improving recovery, which coaches and athletes in training and performance contexts can implement. The Kirlian principle is the underlying principle behind Gas Discharge Visualization (GDV) technology. By using GDV technology, researchers can obtain objective data that can be used to study the effects of outdoor recreation activity on stress levels in taekwondo athletes. 11 Additionally, using GDV technology can provide new insights into the effects of stress on the body, including information about the body's energy balance, which can help improve our understanding of the mechanisms underlying stress. This can be of particular interest to sports science because it can give more specific information about the energy status of the athlete in the competition period, which can help to develop better recovery and performance enhancement methods. The practical significance of the research: This study is significant for taekwondo athletes, taekwondo coaches, taekwondo clubs, and the Latvian Taekwondo Federation. For taekwondo athletes, it is evident: If walking in nature in the training process of the competition period is effective, then the performance of the individuals and team performance increases. Enhanced performance for athletes can increase self-confidence, self-control, self-constancy, and

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stress reduction. They receive a medal in different taekwondo tournaments. Also, the results of the present study may have implications to provide a reference of the effectiveness of outdoor recreation activity, enabling athletes to engage in activities that are beneficial to their stress- recovery in the training process and competition period. The second group is the coaches, the Latvian Taekwondo Federation, and other Taekwondo clubs. The developed recommendations for increased performance in the competition period can help taekwondo coaches prepare athletes in the competition period. The content of outdoor recreation activity in the practice of the taekwondo athlete's competition period can be a successful program intervention to reduce stress and enhance performance, translating into more wins. Winning is the most visible and easily measured criterion of coaching competence. At the same time, the coaches are concerned with many more areas to develop their athlete's abilities. Coaches' job often depend on the number of wins and losses they experience. While teams can improve without increasing their win-loss ratio, winning is the most visible marker. Also, if the taekwondo team were to earn a medal in the international taekwondo competition, it would confirm that the program was highly successful.

Supervisors: Dr. paed., Prof. Juris Grants (LASE)
PhD., Prof. Artur Litwiniuk (AWF)
Dr.sc.admin., Assoc. Prof. Iveta Boge (LASE)

has been developed by ESF support within the project "Strengthening of the Academic Staff of the Latvian Academy of Sport Education in the Field of "Health Care"

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CONGRATULATION

We congratulate Germans Jakubovskis, PhD student at the Latvian Academy of Sport Education, who has defended his thesis "QUANTITATIVE PARAMETER IMPROVEMENT OF COMPETITIVE ACTIVITY AND THE RESPIRATORY SYSTEM OF SWIMMERS" for obtaining the Doctoral Degree (Ph.D.) in the field of Health and Sports science in the Sub-branch of Sport pedagogy at the Latvian Academy of Sport Education on May 9, 2023.

Within the framework of the Doctoral Thesis, detailed quantitative research was carried out on the competitive activity of adult and junior swimmers, and the parameters forming the competitive activity of Latvian swimmers were compared with the parameters of the finalists of the 2016 European Championships. Furthermore, an in-depth analysis of the respiratory system of Latvian adult (18+) and junior (aged 16-17) swimmers was performed. As a result, the correlations between the parameters of competitive activity, respiratory system and underwater undulatory swimming technique and the swimming competition result were proven Practical significance of the research: Theoretical substantiation of the parameters that form the competitive activity, which will enable coaches to objectively assess and correct the swimmer preparation process. 45 Recommendations for improving the underwater undulatory swimming technique have been summarized, which will allow to increase the efficiency of performing the underwater section and the competition result in competitive swimming. A modified and approbated set of exercises developing the parameters of the respiratory system, which will allow to increase the efficiency of performing the underwater section and the competition result in competitive swimming.

Supervisor: Dr.paed., Prof. Jeļena Solovjova (LASE)
Scientific Advisor Dr.paed. Anna Zuša (LASE)

has been developed by ESF support within the project "Strengthening of the Academic Staff of the Latvian Academy of Sport Education in the Field of "Health Care"

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CONGRATULATION

We congratulate Aleksandrs Astafičevs, PhD student at the Latvian Academy of Sport Education, who has defended his thesis "IMPROVEMENT OF MENTAL TOUGHNESS AND GENERAL SELF-EFFICACY OF BASKETBALL PLAYERS FOR INCREASE PERFORMANCE" for obtaining the Doctoral Degree (Ph.D.) in the field of Health and Sports science in the Sub-branch of Sport pedagogy at the Latvian Academy of Sport Education on January 31, 2023.

Scientific novelty of the research: As part of the Doctoral research, three new measuring instruments were adapted, two of which are for determining mental toughness indicators and one is for determining general self-efficacy indicators. The reliability and validity of all three translated questionnaires – Psychological Performance Inventory Alternative version (PPI–A); Sports Mental Toughness Questionnaire (SMTQ), and General Self-Efficacy Scale (GSE) – is consistent with the psychometric structure of the original questionnaires and its indicators. Therefore, all three (PPI–A, SMTQ and GSE) versions of the questionnaires translated into Latvian are valid for use in the Latvian environment, as well as for comparing the obtained results with the scientific studies conducted around the world, in which these measuring instruments are used. A scientifically argued multidimensional model of mental toughness and general self efficacy of athletes for increase performance in sports was developed and approved, and its effectiveness was proven.

Research Boundaries: the Doctoral Thesis investigated the mental toughness and general self-efficacy of athletes. When analysing the indicators of mental toughness and general self-efficacy of Latvian women's and men's national basketball team players, the performance indicators of the players were not analyzed due to the restrictions caused by the pandemic. The multidimensional model of mental toughness and general self-efficacy of athletes for increase performance in sports has been developed. The developed scientifically substantiated multidimensional model of mental toughness and general self-efficacy for increase performance in sports can be used in various team and individual sports. The content of the model is approbated for basketball players, but taking into account the specifics of different sports, it can be adapted to other sports.

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During the ascertaining experiment, the performance indicators of the respondents were determined using the developed control exercises.

Scientific Supervisor: Prof. Dr.paed. Žermēna VAZNE (LASE)
Scientific Advisor: Prof. Dr.paed. Andra FERNĀTE (LASE)

has been developed by ESF support within the project "Strengthening of the Academic Staff of the Latvian Academy of Sport Education in the Field of "Health Care"

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Claessens (2010) found 6evidence that attention will be given to multi-compartment models, such as the 3-water, 3-mineral and 4-compartment models, to assess percentage of body fat. However, Raslanas, Petkus and Griškonis (2010) noted that Aerobic physical load of low intensity got 35.1 % of total trainings time. Research on physical loading also focused on identifying the basis of much years' research of physical activity (Bytniewski et al., 2010). According to Ezerskis (2010), "… heavy physical loads had the undulating character depending on the dynamics of workloads…" (p. 71) yet girls are more ascertained that the Track & Field training helps to develop courage.

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