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Study Protocol

Prevalence of Pain and Disability of the Spine and Joints in Selected Types of Sport: Protocol for a Cross-Sectional Study

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Abstract: (1) Background: Joint and back pain are enormous and important clinical and public health problems that significantly affect people of all ages. Although the epidemiology of pain in the general population is well documented, less information is available in athletes. While in the general population joint and back pain have predominantly functional origin, in athletes, pain is a consequence of not only functional, but very often structural changes in the spine, joints, and related tissues. Depending on the sports specialization, character of the training activity, exercises, training load, and many other factors, athletes are exposed to various injuries accompanied by pain. (2) Aim: This study is aimed at evaluating the prevalence of spinal and limb injuries, and back pain and joint pain among athletes of various specializations. A questionnaire survey on back pain, quality of life, and physical activity will be used to collect data from Slovak athletes. The outcomes of the survey will be compared to a physically active group. This article presents a study protocol that aims to evaluate the relationship between back pain and injury prevalence in athletes of various specializations.

Keywords: back pain; injury; joints; athletes; survey; protocol

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1. Introduction

While participating in regular sporting activity has many undisputed health benefits, according to Dvorak and Jung [1], there are also various risks involved. In addition to the positive health-related effects of various physical activities, athletes are at risk of injuries accompanied by pain and/or lasting discomfort [2]. On the injury incidence scale, sports-related injuries rank second with an incidence of 16%, right behind domestic or household injuries (40%). The majority of sports injuries are incurred as a result of mental and physical fatigue [3]. Hawkins [4] argues that it is due to inattention, fatigue, or under- or overestimation of one's own abilities, it is further reported by Salzmann et al. [5] that contact injuries account for two-thirds of the total number of injuries outnumbering non-contact injuries, which represent one-third of them. It is also worth noting that within the European Union, athletes are associated with approximately 60 to 80% of serious lower limb injuries.

Although results are difficult to generalize due to the varied nature of the related research, it appears that most acute injuries in sport affect the knee and ankle (Table 1). According to Bahr [3], basketball, volleyball, skiing, and soccer are among the highest risk sports in this regard. Playing games and doing sports can damage the knee joints through repetitive impact or torso strain, which can lead to post-traumatic arthrosis [6].

According to a study by Nagle et al. [7], ankle sprain is the most common specific injury in sports such as basketball, lacrosse, and soccer. Players with asymmetry in functional forces of ankle joint flexors, overweight players, and younger players have been found to

have a higher likelihood of ankle injury [8]. Kolář [9] reports on an additional risk for the origin of health problems, namely, the load on the lymphatic system and the low fitness level of the player. However, ankle injury is likely a result of the complex interaction between many internal (athlete-related) and external (environmental) risk factors [10].

Lower limb injuries, according to Nagle et al. [7], occur in the training process between the 1st and 2nd hour of onset. For illustration, in soccer, in terms of neuromuscular fatigue, footballers are more likely to be injured during a match in its second half [11]. According to Veugelers et al. [12], it is the last 15 min of both halves. Similarly in hockey, the risk of injury is significantly higher in matches than in training [13].

Table 1. Authors citing the knee and ankle injuries as one of the most common.

Knee Injuries	
Football	Arundale et al., 2018 [14]; Gouttebarge et al., 2018 [15]; Read et al., 2020 [16]; Salzmann et al., 2017 [5]; Wong, Hong, 2005 [17]
Floorball	Åkerlund et al., 2020 [18]; Leppänen et al., 2015 [19]; Pasanen et al., 2018 [2]; Tervo et al., 2019 [20]; 2020 [21]
Ice hockey	Nordstrom, 2020 [13]; Tuominen et al., 2015 [22]
Runners	Kluitenberg et al., 2016 [23]
Judo	Błach et al., 2021 [24]; von Gerhardt, 2020 [25]
Jiu-Jitsu	Eustaquio et al., 2021 [26]; Lopes et al., 2021 [27]; Moriarty et al., 2019 [28]; Schroeder, Payne, 2021 [29]; Scoggin et al., 2014 [30]
Karate	Cabeza Toro et al., 2019 [31]; Naserpour et al., 2021 [32]; VencesBrito et al., 2019 [33]
Taekwondo	Jeong et al., 2021 [34]
MMA	Tabben et al., 2020 [35]
Several sports listed	Åman et al., 2019 [36]; Buckwalter, 2003 [6]; Hootman et al., 2007 [37]; Takahashi et al., 2019 [38]
Ankle Injuries	
Judo	Noh et al., 2015 [39]; Takahashi et al., 2019 [38]
Ice hockey	Brent et al., 2019 [40]; Crowley et al., 2019 [41]; Morrissey et al., 2020 [42]; Popkin, 2016 [43]
Football	Crowley et al., 2019 [42]; Nagle et al., 2017 [7]; Wong, Hong, 2005 [17]
Floorball	Pasanen et al., 2018 [2]; Radtke et al., 2021 [44]; Tervo et al., 2020 [20]
Taekwondo	Fallahi Farrsah et al., 2020 [45]; Lee et al., 2020 [46]; Son et al., 2020 [47]
Karate	Naserpour, Mirjani, 2019 [48]
Judo	Ferreira et al., 2020 [49]; Kim et al., 2021 [50]; Noh et al., 2015 [39]; vonGerhardt et al., 2020 [25]

Sports such as hockey and soccer are defined by the fast pace of play in a short timeline, which often puts athletes at high risk of fatigue and injury [51]. The above category further includes floorball, where overload and trauma-related injuries are equally prevalent [52].

Ice hockey is one of the most popular and fastest sports in the world. The nature of play, and load, create preconditions for various types of injuries (Table 2). Soccer is an equally popular sport, but with a broader membership base due to its greater accessibility. The risk of injury for a professional footballer is about 1000 times higher than for someone in a civilian occupation such as construction or mining, which are high risk occupations (0.02 injuries per 1000 h). As for contact sports, for example, English soccer has little difference in injury rates compared to rugby (28 to 50 injuries per 1000 h) [13]. According to Goodman et al. [53], groin injuries have up to 2.9 times higher likelihood of recurrent occurrence compared to new injuries, which in their research were as high as 86%.

Floorball is a fast-paced indoor team sport with growing popularity worldwide [2]. A study conducted on elite athletes in the Swedish premier league reported an incidence of 0.49 injuries per 1 player during the season [52]. The afore mentioned authors found 27% of injured players in their study, while a study by Snellman et al. [54] (2001) found up to

34% of players to have suffered more than 40% injuries during a one-year observation. The injury rate was 1.0 per 1000 practice hours for both sexes. The injury rates per 1000 game hours were 23.7. One hundred injuries (83%) were acute and the remaining 20 (17%) were overuse injuries.

Table 2. Other sports injuries.

Ice hockey	face, head, shoulder, long bone fractures, traumatic brain injury, superficial wounds	Morrissey et al., 2020 [42]
	hip and groin injuries	Mehta et al., 2019 [55]
	head, shoulder	Nordstrom, 2020 [13]
	dental and face injury, shoulder	Åman et al., 2019 [36]
Football	groin injuries	Bahr, 2004 [3]
	hamstrings injuries	Eggleston et al., 2020 [56]; Pasanen et al., 2018 [2]; Renoux et al., 2019 [57]
	groin and hip injuries	Wong, Hong, 2005 [17]
	lacerations, contusions, sprains, dislocations and fractures	Buzek, 2007 [58]
Floorball	eye, face, head	Radtke et al., 2021 [44]
	eye, face	Åman et al., 2019 [36]
Boxing	head, neck	Alevras et al., 2021 [59]; Pal, 2020 [60]; Zazryn et al., 2009 [61]
	head, face	Wolfe et al., 2021 [62]
	upper limb	Alevras et al., 2021 [59]
Taekwondo	head, trunk, face	Jeong e al., 2021 [34]
	hand, wrist	Geßlein et al., 2021 [63]
Karate	head, neck	Lystad et al., 2020 [64,65]; Pal, 2020 [60]
	Shoulder, hand, foot	VencesBrito et al., 2019 [33]
Jiu-Jitsu	elbow foot—toe, costochondral injuries, rib injuries and lacerations	Scoggin et al., 2014 [30]
	shoulders	Eustaquio et al., 2021 [26]; Lopes et al., 2021 [27]
Judo	shoulders, elbows	Błach et al., 2021 [24]; Noh et al., 2015 [39]
	fingers, shoulders	vonGerhardt et al., 2020 [25]
	head, brain	Muryama et al., 2020 [66]
MMA	head, neck	Pal, 2020 [60]
	laceration, contusions, haematomas, concussions, bone and cartilage fractures	Ross et al., 2021 [67]
Kickbox	head, neck	Pal, 2020 [60]

Musculoskeletal injuries in combat sports occur regularly. When observing the Olympic sports, boxing, judo, taekwondo and wrestling, Lystad et al. [65] found that athletes sustained an average of one injury every 2.1 h. The risk of injury was significantly higher in boxing, judo, and taekwondo compared to wrestling. According to a study by Noh et al. [40], musculoskeletal injuries were most frequent in judo from among the six combat sports considered. In this respect, judo is followed by taekwondo in which the number of injuries to the lower limbs is similar, while injuries to the upper limbs are less common. In combat sports, injuries occur between the first five, to half of the, fights, especially in boxing, karate, and taekwondo. A different study by Petrisor et al. [68] confirms that Jiu-Jitsu athletes are injured in training at a higher percentage (91%) than in a competition (60%). On the other hand, compared to other combat sports, karate incurs fewer injuries [69]. Mixed martial arts (MMA) is steadily gaining popularity worldwide. A study by Ross et al. [67] revealed that out of 503 MMA fights examined, injuries occurred in 285 (57%). The study by Baranto et al. [70] suggests that most injuries occur during the growth period. The study by Jayanthi et al. [71] and DiCesare et al. [72] confirms that injuries in young athletes occur especially when overloading in the training process due to premature specialization intervening in their natural sports training.

As reported by Zemková et al. [73], up to 20% of all sports injuries involve the lower back (LB) or the neck. According to the authors, repetitive or high impact loads (e.g.,

running, gymnastics, and skiing) and weight loading (e.g., weightlifting) affect the LB. Rotation of the torso (e.g., golf, and tennis) causes damage to both, the lumbar and thoracic spine. The cervical spine is most commonly injured in contact sports (e.g., boxing, and football).

Closely related to sports and injuries is pain in the various joints, but also in the spine. Spinal pain affects 54–90% of the general population [74]. Statistics show that 8 out of 10 people suffer from back pain [75], with the most common area of pain occurrence being the lower spine [75–81]. All musculoskeletal disorders considered, low back pain (LBP) is a very common health problem worldwide and a major cause of disability—affecting performance at work and general well-being (WHO) [82]. Globally, the prevalence of LBP in the general population reached 7346 cases per 100,000 of the population in 2019. This compares to Slovakia's rate of 12,855 cases per 100,000 inhabitants [83]. Regarding the general population, the prevalence and epidemiology of low back pain is well explored [81]. Differences between people with and without LBP suggest that those with LBP are more likely to perform hip and trunk rotations [84].

Several authors concur that back pain and sports are mutually associated [85–89]. Different studies report on degrees of correlation between physical activity and "spinal health" [83,89–91]. They also point to the phenomenon that a high level of physical load helps to prevent certain injuries, but on the other hand, it also incurs increased load on the spine and thus a possible incidence of injuries accompanied by pain. The prevailing view is that adequate sporting load has a positive effect on spinal health; however, there is a lack of adequate information on the optimal dose–effect relationship. Of particular importance in this context is whether elite athletes are exposed to a higher risk of developing spinal pain compared to physically moderately active individuals. Nevertheless, it cannot be said unequivocally that long-term systematic loading in sports training is associated with a higher incidence of spinal pain. The previously published rate of LBP in athletes ranges from 1.1 to 30% [92–95]. The lifetime prevalence of low back pain ranges between 33 and 84%, with its variability depending on the type of sport [10]. The findings, however, cannot be generalized because, in addition to the type of sport, they are also influenced by gender, intensity of training, frequency of training, or even the sport technique. Greater pain has been reported by experts in sports that have a more pronounced load on the spine [75,84,96–98]. These are predominantly contact sports such as American football, soccer, hockey, floorball, but also golf, weightlifting, and gymnastics [70,75,86]. Further reported is a non-significant difference in LB injury rates between contact and non-contact sports [62]. Trompeter et al. [81] conducted a large study using the questionnaire method (1114 athletes) and found a lifetime prevalence of low back pain of up to 89%, with the lowest prevalence found in triathletes (56%) and the highest—up to 100% in the sports of diving, fencing, and water polo. The odds ratio of developing back pain was significantly higher in elite athletes, and it did not prove possible to unify the type of sport where the prevalence was higher compared than other sports.

Some studies have reported higher LBP in athletes compared to non-athletes [3,71,75,93,99], while conversely, other studies have found no difference in the prevalence of LBP in athletes and non-athletes [85,94,100]. LBP also frequently occurs in athletes at a younger age. Pain increases with age and peaks as early as at 13–14 years of age [101]. During the phase of adolescence, according to Kujala et al. [102] the spine is vulnerable and sports can induce an increased number of anatomical changes.

Despite the plethora of studies dealing with spine and joint injuries and pain in athletes, information on this issue in adult athletes is underrepresented. Most research focuses primarily on injuries and pain in the general population or youth athletes. In Slovakia, these data are completely absent. Similarly, the impact of the above-mentioned difficulties on the quality of life of athletes is lacking.

For the purpose of this research, we have selected the three most popular team sports in Slovakia, and from the individual sports we have chosen combat sports, which have a higher prevalence of injuries and pain in the spine and joints compared to other individual

sports. The set of elite athletes will be compared with athletes who do sports at a lower performance level.

The primary objective will be to determine the prevalence of spine and extremity injuries and back and joint pain in athletes in selected sports. In addition, the project could also help to obtain information on the localization of injuries and pain in Slovak athletes.

The secondary objective will be to monitor the quality of life of athletes with respect to the prevalence of spine and joint pain.

Based on the available literature, we hypothesize that there will be a higher prevalence of lower limb injuries in the team sports group than in the individual sports group. Conversely, we expect a higher prevalence of injuries in the individual sports group compared to the team sports group. We do not expect differences in spinal pain between collective and individual sports. We expect a reduced quality of life in the group of athletes with low back pain compared to athletes who have been injured at some point in time.

2. Materials and Methods

2.1. Participants and Settings

Individual sports clubs in Slovakia will be addressed with a request to participate in the study. From among collective sports, all clubs playing in the top two leagues within the three most preferred and mass sports in Slovakia will be approached—football, hockey, and floorball. From the individual sports we will address clubs that are engaged in combat sports—karate, boxing, Jiu-Jistu, Taekwondo, and MMA. The precondition for involvement in the study will be participation in the highest-level Slovak competitions and participation in international competitions. More detailed conditions are set by inclusion and exclusion criteria.

The control group will consist of athletes who participate in the lower-level competitions of the particular team sports (3rd to 5th league), and combat sports athletes who participate in competitions at the regional level.

Currently in soccer, there are 12 clubs in the First League and 16 clubs in the Second League in Slovakia. In hockey, there are 12 Extra League clubs and 11 First League clubs; in floorball there are 12 Extra League as well as First League clubs. On average, there are 25 players per club, making a total of 1875 players. Of the combat sports, we will choose Karate with 131 clubs operating in Slovakia, Jiu-Jitsu with 22 clubs, Judo with 49 clubs, Taekwondo with 25 clubs, MMA with 20 clubs, and Boxing with 107 clubs. Despite the large number of clubs covering combat sports, there are only around 250 athletes in Slovakia falling within the age and performance group under study.

Sample size

We calculated minimum sample size according to the estimation given in Daniel [103], where $n = Z2P(1 - P)/d2$ (Z = 2.576 for 99% level of confidence; P = 0.5 for expected sample proportion of 50%; d = 0.05 for the 5% margin of error). Based on this calculation, the minimum number was set at 320 athletes in team sports. The target cohort will consist of 840 athletes, from which the sample size will be determined by the average prevalence (50%). We set a higher number of $n = 400$ as we anticipated a 20% loss.

In combat sports, the target cohort will consist of 141 athletes from which the sample size will be determined by the average prevalence (50%). Based on this calculation, the minimum number was set at 71 athletes. We set a higher number of $n = 85$ as we anticipated a 20% loss. Randomization will be carried out using Microsoft Office Excel 2016.

The inclusion and exclusion criteria

Inclusion criteria were as follows:

Experimental group:

- Adult men between 18 and 35 years;
- High intensity of physical activity confirmed by the IPAQ questionnaire (Activities with a MET score over 8);

- Active membership in a club competing in 1st or 2nd highest league in team sports; participation in the highest-level combat sport competitions in Slovakia, including participation in some of the international competitions.
- Duration of training unit 90 min or more four times per week;
- Minimum training experience—4 years;

Control group:

- Adult men between 18 and 35 years;
- Training frequency 1–2 times per week;
- Moderate intensity of physical activity confirmed by the IPAQ questionnaire (Activities with a 3.0 to 6.0 METs.
- Duration of training unit 90 min or more 1–2 times per week;
- Minimum training experience—4 years.

Exclusion criteria were as follows:

- Irregular training participation;
- Body Mass Index (BMI) above 30 (in kg/m^2);
- Not answering all questions.
- Currently interrupted sporting career lasting more than 2 months.

2.2. Study Design

This cross-sectional study is designed to determine the prevalence of spine and extremity injuries and back and joint pain in athletes in selected sports. The timeline of study protocol is presented in Figure 1.

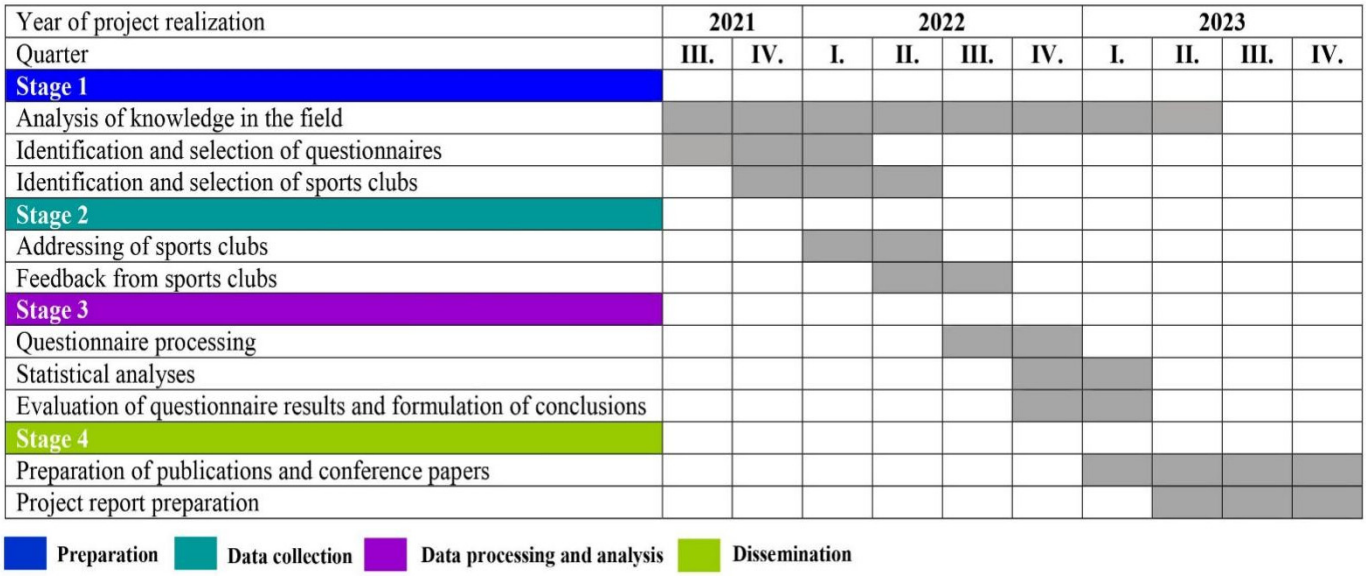

Figure 1. Timeline of study protocol.

Objectives:

(1) To determine the prevalence of upper extremity (shoulder, elbow, and wrist) injuries and pain in athletes in selected sports,
(2) To determine the prevalence of lower limb injuries and pain (hip, knee, and ankle) in athletes in selected sports,
(3) To determine the prevalence of spinal pain in selected sports.
(4) To monitor the quality of life of athletes with respect to the incidence of spine and joint pain.

2.3. Procedures

The research will be conducted by means of a questionnaire survey. A total of 9 validated, standardized and internationally recognized questionnaires will be used to ascertain quality of life, physical activity, and injury and pain evaluation in athletes (Table 3). After agreeing on the collaboration with each club, the research team members will obtain the athletes' basic anamnestic data (year of birth, highest educational attainment) and basic training characteristics (type of sport, training frequency and duration, duration of practicing the sport in years, and other sport activities performed in addition to the main sport) at the initial interview. Subsequently, body height and weight in probands will be measured and recorded. Once these baseline characteristics have been established, a brief power point briefing will take place instructing upon completing the questionnaire. The questionnaire will be completed by the athletes at home, online via Google Form. Each participant will be sent a link to log in and then complete the questionnaire. It will take the respondent approximately 30 min to complete. The questionnaires will be completed in Slovak language. The questionnaire data will be transferred to a database and checked for completeness by members of the research team. All information and data will be processed in accordance with the GDPR.

Table 3. List of questionnaires used in the study.

Disability and Injuries	Quality of Life and PA
McGill Pain Questionnaire.	EuroQol-5 Dimension (EQ-5D-5L)
Oswestry Disability index	International Physical Activity Questionnaire
The International Knee Documentation Committee	
The Foot and Ankle Disability Index FADI	
Oxford's hip score	
Shoulder pain and disability index	
The Patient-Rated Wrist Evaluation	

2.4. Description of Applied Methods and Their Explanation

McGill University Pain Questionnaire—back pain and disability of spine

It describes the intensity of current pain as well as sensory and affective dimensions. It consists of 15 questions describing the different types of pain and the intensity of actual pain from zero to unbearable 5. The higher the score, the greater the pain intensity.

Oswestry Disability Index (ODI)

It informs about the range of back and joint pain-related disability. It consists of 10 sections: Section 1—Pain Intensity. Section 2—Self care (washing, dressing, etc.) Section 3—Lifting, Section 4—Walking, Section 5—Sitting, Section 6—Standing, Section 7—Sleep, Section 8—Sexual life, Section 9—Social life, Section 10—Travelling. Each section is scored on a 0–5 scale, where a higher number characterizes a higher degree of pai-related disability. The questionnaire is filled in at the initial examination and consequently before the end of complex rehabilitation treatment.

The Foot and Ankle Disability Index (FADI)

The Foot and Ankle Disability Index FADI is a 34-item questionnaire that is divided into two scales—foot and ankle. FADI has 26 items (4 items for pain evaluation and 22 items for activity evaluation). FADI sport has 8 items (evaluation of activities). Items detect function deficits in athletes.

Knee pain and disability

The International Knee Documentation Committee (IKDC)—Knee function evaluation questionnaire. It has 3 categories—symptoms, sports activity, and knee function. Symptoms such as pain, stiffness, swelling, and knee dysfunction are evaluated. Sports activity subscales evaluate functions such as walking up and down stairs, standing up from a chair, squats, and jumps. In what condition is the knee now and how it was before the injury is scored on a 0 to 100 scale. The higher the score, the better the knee function.

Hip pain and disability

Oxford's hip score—Questionnaire containing 12 questions. It includes two—pain and disability. Six items in each section; 1 = least difficult, 5 serious difficulties. The scores range from 12 to 60. The lower the score, the better the result: 0–19—severe arthrosis of the hip, 20–29 severe-to-moderate hip arthritis, 30–39—moderate-to-mild hip arthritis, 40–48—good hip function.

Shoulder pain and disability

Shoulder pain and disability index (SPI) consists of two dimensions, one for pain and the other for functional activities. It assesses the severity of pain in 5 questions and the disability related to functional activities in 8 questions. The scoring: 0—means no pain and disability, 100 means severe pain and disability.

Elbow pain and disability

Oxford Elbow Score (OES)—contains 12 items with 5 response options each, and evaluates the upper limb disability and the elbow function. It has a high internal consistency and reliability. The higher the score, the better the result: Scoring: 4—no difficulties; 3—moderate difficulties; 2—small difficulties; 1—big difficulties 1; 0—no performance possible. Interpretation of the questionnaire: 0–19 points indicate severe arthritis of the elbow, orthopedic consultation required; 20–29 Indicates moderate-to-severe arthritis of the elbow. Consider orthopedic consultation; 30–39 indicates mild-to-moderate elbow arthritis. Recommendations for conservative treatment, including physiotherapy; 40–48 indicates good elbow joint function. It does not require any treatment.

Wrist pain and disability

The Patient-Rated Wrist Evaluation (PRWE)—questionnaire contains 15 questions for evaluating wrist problems. It consists of 2 subscales of pain and function (specific activities, common activities). The score ranges: 0—no pain, problem, 10—maximum pain, problem.

Quality of life—EuroQol-5 Dimension (EQ-5D-5L)—Slovak version.

The quality-of-life questionnaire most recommended and widely used in Europe. Dimensions include mobility, self-care, daily activities, pain and discomfort, and anxiety and depression. The score ranges from 0—death to 1—perfect health. It includes Visual Analogue Scale (VAS) ranging from 0 to 100; 0—worst health condition, 100—best health condition.

Intensity of physical activity IPAQ—International Physical Activity Questionnaire —short version was used to assess the intensity of physical activity. It contains 4 questions to monitor the time spent on regular physical activities during the past 7 days. It classifies low, moderate, and high intensity physical activity as shown in Table 1 (Craig et al., 2003). Cronbach's alpha IPAQ is >0.9 and ß = 0.96.

Ethics and Dissemination

The procedures described are in accordance with the ethical standards as laid down by the 1964 Helsinki Declaration and its later amendments. Participants will be verbally informed of the main study objective, procedures and benefits, confidentiality, and the voluntary nature of their participation and provided an opportunity to ask questions. Prior to inclusion, written informed consent will be obtained. The protocol was approved by the Human Research Ethics Committee of Pavol Jozef Šafárik University in Košice [approval No. PJSU-1/2020].

Statistical Analysis

Statistical analysis will be performed using SPSS software (version 23, IBM, Armonk, NY, USA). Descriptive and analytical statistics will be used. Data will be presented by mean and standard deviation (SD), *p*-values will be obtained by means of the Mann–Whitney nonparametric unpaired test. The characteristics of the respondents will be expressed as mean and standard deviation. Odds ratios will be reported with 95% confidence intervals (CI). Statistical significance will be defined as a *p*-value <0.05.

3. Conclusions

Injury is the biggest risk factor for future recurrent injury. If an athlete does return to competition after an injury, care, and monitoring must be taken at all times. The project is designed as a cross-sectional study. The primary objective will be to determine the prevalence of spine and extremity injuries and back and joint pain in athletes in selected sports. In addition, the project could also help to obtain information on the localization of the injuries and pain in Slovak athletes. The secondary objective will be to monitor the quality of life of athletes with respect to the prevalence of spine and joint pain. Strengths of our study include the use of validated and internationally recognized questionnaires that detect a wide range of joint and spinal pain and injury. A weakness of the study may be considered to be the length of time it takes to complete the questionnaire, which therefore limits the interest of clubs and athletes to participate in the study.

Based on the available literature, we hypothesize that there will be a higher prevalence of lower limb injuries in the team sports group than in the individual sports group. Conversely, we expect a higher prevalence of injuries in the individual sports group compared to the team sports group. We do not expect differences in spinal pain between collective and individual sports. We expect a reduced quality of life in the group of athletes with low back pain compared to athletes who have been injured at some point in time.

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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of Pavol Jozef Šafárik University in Košice [approval No. PJSU-1/2020, date: 2020-02-17].

Informed Consent Statement: Written informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The authors declare no conflict of interest.

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