Exercise Recommendations for e-Athletes: Guidelines to Prevent Injuries and Health Issues

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In the last two decades, video games have gone from being pastimes to being a coveted profession with competitions broadcasted worldwide and high earnings for the winners. However, the esports environment is still little known, presenting a lack of knowledge on how to get physically ready to minimize the effect of prolonged sitting or avoid career-ending injuries. This article provides coaches and serious gamers with a program based on evidence and simple to implement. The main aims will be to prevent esports’ common injuries such as cervical and lumbar pain, wrist and shoulder overuse, and peripheral neuropathies. Our proposal contains protocols for warming-up, preventing injuries, and taking active breaks.

Keywords: injury management, conditioning, video games, active life

Esports are a growing market phenomenon with an increasing number of fans. Thanks to television stations and streaming companies, the major tournaments are transmitted worldwide through different formats, reaching millions of viewers who follow a specific team or player for passion and enjoyment (Jenny et al., 2018; Kane & Spradley, 2017). Players are organized into teams supported by sponsors with earnings similar to traditional athletes. These aspects have developed esports into an actual profession during the last two decades (Kane & Spradley, 2017).

Despite this growth, there is still a lack of information about esports, probably due to the novelty of the phenomenon (Emara et al., 2020; Rossoni et al., 2023). In this regard, there is not much knowledge about the elements underlying gamers’ expertise (Pluss et al., 2019), the problematic behaviors that can afflict them (Griffiths & Nuyens, 2017), or the best esports training and preparation strategies (Franks et al., 2022; Pereira et al., 2019, 2022). This deficiency of evidence-based knowledge makes esports an activity that could lead to some mental and physical dangers.

The esports environment is complex and characterized by high physical and mental demands, contributing to a precarious lifestyle (e.g., uncertain context, mental and health disorders, or social issues; Brock, 2017; Difrancisco-Donoghue et al., 2019; Holden et al., 2018; Pereira et al., 2019, 2022). This problem is exacerbated by a lack of knowledge about the best ways to train and prepare (Franks et al., 2022; Pereira et al., 2019, 2022) or how to correctly manage e-athletes’ injuries (Difrancisco-Donoghue et al., 2019). Some studies report that professional esports players perform physical activity regularly mainly to maintain overall physical health and have a more active lifestyle (Pereira et al., 2022; Rossoni et al., 2023). According to a recent scoping review (Pereira et al., 2022), only 6%–8% of esports players report doing physical activity to improve their performance. However, esports players believe that physical activity and exercise have potential performance benefits, in contrast to coaches and teams who place little emphasis on this aspect of training (Pereira et al., 2022). Up to now, physical exercise appears to be unstructured with players planning their own exercises and only a few referring to professionals (Kari & Karhulahti, 2016; Pereira et al., 2022).

The scant attention given to structured and systematized training protocols can contribute to the onset of musculoskeletal injuries that may limit participation in esports-related activities, if not also lead to a premature career ending in the most severe cases (Difrancisco-Donoghue et al., 2019; Pereira et al., 2022). Generally, rehabilitation and preventive exercises are performed occasionally, particularly when players already feel pain or stiffness (Pereira et al., 2022).

Considering all these aspects and focusing on musculoskeletal issues and postural patterns observed in video gamers, this narrative review aims to analyze the health risks and the performance-boosting activities related to esports. The scarcity of specific research on the matters leads us to consider recommendations regarding other specific populations with similarities, such as office workers or musicians. Sedentary occupations involving repetitive movements that imply several hours of sitting or a significant implication of upper limbs (e.g., dexterous actions) are related to similar injuries such as neck and low-back pain or peripheral neuropathies (Difrancisco-Donoghue et al., 2019; Franks et al., 2022; Geoghegan & Wormald, 2019; Lam, Liu, et al., 2022; Pereira et al., 2019; Rossoni et al., 2023).

Our proposal analyzes the characteristics for three central moments: warm-up, cooldown, and active breaks. After an adequate warm-up, a performance improvement can be expected in the subsequent bouts of exercise, and there is little evidence suggesting that it is detrimental to people who participate in sports (Fradkin et al., 2010; McCrory et al., 2015). Additionally, a cooldown is recommended after sessions, as it contributes to improving physical and psychological recovery and preventing symptoms of musculoskeletal injuries (Parry, 2003; Redman & Fielding, 2020; Rosset & Llobet, 2007). Active breaks support a better processing speed and executive function in esports players than...
resting breaks or no breaks (Difrancisco-Donoghue et al., 2021). Furthermore, if these breaks are performed with vigorous intensity, they could help reduce the damage done to cardiometabolic health due to prolonged sedentary behavior (Islam et al., 2022). Finally, as in many traditional sports, injury prevention improves player availability (e.g., it may contribute to limiting the time lost due to injuries).

**Health Risks and Common Injuries in Esports Players**

Due to the suboptimal posture held over time and the high number of repetitive movements (e.g., 10 moves per minute on average; Difrancisco-Donoghue et al., 2019), esports players could suffer from both sports injuries and occupational health risks (Lam, Chen, et al., 2022). In this population, overuse injuries and repetitive strain injuries that threaten their performance as well as their careers have been reported (Difrancisco-Donoghue et al., 2019; Emara et al., 2020; Geoghegan & Wormald, 2019; Lam, Chen, et al., 2022). “Nintendo Neck” is among the most common injuries, presenting as axial pain extending from the cervical to the lumbar region (Emara et al., 2020; Lam, Chen, et al., 2022). It is the result of a prolonged suboptimal posture characterized by a spinal flexion maintained for long periods with a forwarded head (Emara et al., 2020). According to a previous publication (Emara et al., 2020), this can cause stress on the cervicothoracic junction and lower paraspinal muscles and an overload of the cervical extensor muscles, causing neck pain. In addition, several authors report that esports players prematurely develop degenerative changes in the cervical region with associated cervical radiculopathies that usually occur in association with peripheral compressive neuropathies (Difrancisco-Donoghue et al., 2019; Emara et al., 2020; Geoghegan & Wormald, 2019; Pereira et al., 2019). This inadequate posture associated with prolonged screen exposure and repetitive movements performed by the upper extremities can also lead to visual strain and overuse of the shoulder, elbow, and wrist (Difrancisco-Donoghue et al., 2019; Emara et al., 2020; Lam, Liu, et al., 2022; Pereira et al., 2022).

Players must not underestimate symptoms related to these injuries as they could seriously affect their careers if neglected for a long time. In some cases, professional players have withdrawn from competition due to injuries (Bräutigam, 2016; Lam, 2018).

Another risk related to hours spent sitting and reduced movement of the lower limbs concerns deep vein thrombosis. It happens when a clot appears in a deep vein, such as those in the leg. The clot could break off and enter the lungs’ arteries, provoking pulmonary embolism. Although this occurs more rarely than the injuries previously reported, it would be good to integrate prevention protocols aimed at reducing periods of immobility into the training program, because if ignored, deep vein thrombosis can be risky for athletes’ lives (Difrancisco-Donoghue et al., 2019; Emara et al., 2020).

The mentioned competitive and demanding environment may also impact the players’ mental health. It could increase the risk of psychological and behavioral problems such as addiction, anxiety, social isolation, poor personal hygiene, attention deficit hyperactivity disorder, aggression, insomnia, and burnout (Brock, 2017; Emara et al., 2020; Holden et al., 2018; Pereira et al., 2022; Pérez Rubio et al., 2017). For this reason, it is crucial that the training protocols also include psychological exercises designed to make players emotionally stable and able to face the pressure of competition while maintaining speed and precision of movement (Franks et al., 2022; Nagorsky & Wiemeyer, 2021).

**Warm-Up and Cooldown Protocols**

A warm-up is a period of specific preparatory exercise. Improvements after its implementation have been demonstrated in aerobic and anaerobic sports and other activities, such as agility or vertical and long jumps (Fradkin et al., 2010). All types of athletes (i.e., recreational, amateur, or professional) could benefit from a proper warm-up protocol (Fradkin et al., 2010). Apart from this performance-boosting effect, warming-up is usually related to a potential positive impact on injury prevention, although this effect has yet to be proven in upper extremities protocols (McCrary et al., 2015; Myburgh et al., 2020). Some factors may also impact the benefits of a specific warm-up protocol on performance, such as training status, conditioning, maturation level, age, gender, self-efficacy, or expectations (Fradkin et al., 2010; Myburgh et al., 2020). As such, the warm-up protocol should be individualized according to the characteristics and needs of the athlete (Myburgh et al., 2020).

Traditionally, a proper warm-up protocol includes a brief period of low-intensity aerobic exercise (i.e., light jog or cycle), stretching (i.e., dynamic mobility exercises), and sports-specific exercises in this order (Fradkin et al., 2010; Myburgh et al., 2020). It should focus on the body segments and mirror movement mechanics and skills required in the event, also improving confidence and competency during their execution (Fradkin et al., 2010; McCrary et al., 2015; Myburgh et al., 2020). The benefits could also be extrapolated to the psychological domain, such as giving the athletes some time to mentally prepare for the following event (Myburgh et al., 2020). However, it is common that these protocols performed by athletes are incomplete (e.g., they only include one or two of the three parts of a proper warm-up; Fradkin et al., 2010; Myburgh et al., 2020).

In the musicians’ context, a warm-up should include keyboard exercises, stretches, breathing exercises, full-body/general flexibility exercises, and postural alignment (Parry, 2003). In addition, it is recommended to use relaxation routines (i.e., breathing or relaxation exercises, Tai Chi, or Feldenkrais) to prevent anxiety, tension, and pain (Parry, 2003). Moreover, more specific warm-up exercises have been proposed focusing on certain body parts that may have a higher risk of injuries in musicians (Shearer, 2018). Considering all this information, a proper warm-up protocol may be an essential factor to consider in the training and competition routines of e-athletes. In this way, esports players may be able to improve their performance, be more mentally prepared, and reduce injury risk.

Based on previous suggestions designed for other populations (Redman & Fielding, 2020; Rosset i Llobet, 2007; Shearer, 2018), we set an initial proposal of esports warm-up that can be modified to tailor different needs (Table 1; Figures 1–4).

Cooldowns after gaming sessions are another factor that may significantly impact an esports player’s performance. Once a music playing session is over, performing a cooldown has been suggested to improve physical and psychological recovery and prevent musculoskeletal injuries (Parry, 2003; Redman & Fielding, 2020; Rosset i Llobet, 2007). These ideas could also be applied to esports players, whether they have completed a training or competition bout. First, these protocols should include a phase in which the activity performed is done in a gentle, slow, and simple way (Redman & Fielding, 2020; Rosset i Llobet, 2007).
Afterward, stretches and windup postures executed gently should follow (Redman & Fielding, 2020; Rosset i Llobet, 2007). The final part of the protocol should include a period of lying or sitting while a slow breath is done letting the ribs expand, and finishing with some time devoted to quietly considering what was done during the gaming session (Redman & Fielding, 2020). Based on prior cooldown suggestions (Redman & Fielding, 2020; Rosset i Llobet, 2007), we present our proposal (Table 2).

### Injury Prevention Protocol

Professional esports players suffer career-threatening injuries (Difrancesco-Donoghue et al., 2019). They have an increased vulnerability to overuse injuries (DiFrancisco-Donoghue & Balentine, 2018; Franks et al., 2022; Pereira et al., 2019). Injuries in esports are related to the repetitive movement patterns performed by the upper extremities (Franks et al., 2022; Geoghegan & Wormald, 2019). Common injuries sustained by esports players are eye fatigue, neck pain, back pain, wrist pain, and hand pain (Difrancesco-Donoghue et al., 2019; Franks et al., 2022; Rossoni et al., 2023).

### Table 1 Esports Warm-Up Protocol Suggestions

<table>
<thead>
<tr>
<th>Exercise characteristics</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Aerobic—low intensity    | Marching on the spot with arm swings.  
|                          | Light jog (indoors, outdoors, on a treadmill . . . ).  
|                          | Cycling (indoors, outdoors, on a stationary bike . . . ).  
|                          | Activities that use the bodyweight: jumping jacks, burpees . . . .  
| Stretching               | Head turns and drops.  
|                          | Arm circles (forward and backward).  
|                          | Forearms rotations.  
|                          | Forming a fist and spreading the fingers.  
| Sport-specific activities| Solve crossword puzzles while lightly riding on a stationary bike or light jogging (cognitive skills + cardio activity).  
|                          | Juggling with beanbags or balls (start with one then slowly start adding three or more). Variation: change in execution speed in response to an acoustic stimulus (eye–hand coordination + reaction time).  
|                          | Lights hand touch (players have to touch the lights in response to an acoustic or visual stimulus; reaction time + cognitive skill).  
|                          | Playing the game in which the player will compete in an easier environment (i.e., friendly matches, minigames from the actual game . . . ).  
|                          | Breathing exercises, visualization exercises, or strategies to improve mood.  

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**Figure 1** — Forearms rotations: initial (a), middle (b), and final (c) positions. The movement is reversed once the final position is reached.

**Figure 2** — Solve crossword puzzles while lightly riding on a stationary bike or light jogging. Using a stationary bike or a treadmill with support for the puzzles is recommended.
Many of these injuries are like those sustained by people with sedentary occupations (Difrancisco-Donoghue et al., 2019; Lam, Liu, et al., 2022), such as desk jobs or musicians. Working on compensatory exercises for the typical anterior dominant posture of esports athletes and strengthening those body parts that are more used during esports sessions should be the main aim (Franks et al., 2022).

When implementing routines in esports players, a whole-body approach should be taken to avoid generating new imbalances. General health guidelines recommend involving all major muscle groups in the strength training sessions (U.S. Department of Health and Human Services, 2018). In situations in which pain related to esports development is already present, there should also be an emphasis on trunk posture and scapular stabilization (Shafer-Crane, 2006). The authors of a previous publication (Emara et al., 2020) provide specific recommendations for exercise routines to prevent injuries and pain in e-athletes. First, they introduce core exercises to hold the body upright in a stable and balanced postural position and minimize the risk of musculoskeletal and spinal disc chronic injuries from prolonged sitting. Second, they focused on the upper-extremity complex, particularly on the athlete’s movement mechanics from their fingers to their shoulders. Stretching and strengthening the hand, wrist, forearm, and elbows to maintain appropriate alignment while not sacrificing speed of action should also be considered (Emara et al., 2020). According to the same authors, it is also recommended to include eccentric load activities for the elbow to help prevent chronic injuries, such as lateral epicondylitis. The use of padded wrist support, avoidance of continuous use of the ulnar aspect of the wrist as a pivot for mouse movements, and intermittent complete wrist motion exercises to reduce the risk of developing carpal and ulnar tunnel syndromes are also advised (Emara et al., 2020).

Bearing in mind all this information, an injury prevention protocol is presented. Our protocol mainly focuses on strengthening and gaining mobility in the trunk, the back, the shoulder girdle, the neck, the pectoral muscles, the arms, the forearms, the wrist, and the hands (Table 3; Figures 5–10).

**Active Breaks**

In sedentary occupations, it is recommended to regularly take breaks and do exercises so that posture can be realigned and tension released (Redman & Fielding, 2020). It is essential that everyone moves more and sits less, reducing sedentary time (DiFrancisco-Donoghue et al., 2022). Physical activity is the best way to attenuate prolonged sitting effects (Lavie et al., 2019; Pereira et al., 2019). Being seated for a prolonged time may have a detrimental effect also on executive function (Difrancisco-Donoghue et al., 2021).

Research showed that a 6-min walking break in the middle of an approximately 2-hr gaming session improved the executive function of esports players, and although it did not impact the game performance, the e-athletes felt that the active break boosted it (Difrancisco-Donoghue et al., 2021). In this sense, most of them perceived that it positively helped their gaming performance, albeit no improvement on it actually happened (Difrancisco-Donoghue et al., 2021). A timeframe of 2.5 hr of continuous gaming has been related to a decrease in accuracy and an increase in the impulsivity of esports players (Sousa et al., 2020). In this regard, a recent publication (Nagorsky & Wiemeyer, 2021) reported that players who practiced video games in intervals (distributed practice) improved their skills faster than other players who practiced without a break (massed practice). However, the optimal duration of gaming before the start of performance declines, or before the onset of health risks, has not been established yet (Nagorsky & Wiemeyer, 2021; Sousa et al., 2020).

According to this information, a 6-min active break per hour of gaming could be a sound strategy to help e-athletes’ health, potentially benefiting their performance. Additionally, it could also help decrease the axial stress placed on the back (Emara et al., 2020). These active breaks every 60 min are probably a more

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**Figure 3** — Juggling with beanbags or balls. Having a stable and controlled rhythm should be aimed before increasing the movement speed.

**Figure 4** — Lights hand touch: initial position (a), followed by a first stimulus (b) and a second one (c). After each stimulus, the player should return to the initial position.
reasonable approach for esports players’ timings than a strategy with more frequency (Difrancesco-Donoghue et al., 2021). Notwithstanding, this could be interpreted as a minimum, and more time may be devoted to active breaks depending on the schedule of e-athletes. In activities such as music, it is essential to stop playing before any discomfort is felt, as playing through pain should never be attempted (British Association for Performing Arts Medicine, 2021). The same rationale should be applied to esports.

Finally, we propose three levels of activities to be performed during active breaks, classified by their complexity, time and equipment needed, and preparation or training level required for them. Three types of activities are proposed for each level of complexity, but different physical activities can be implemented depending on the needs, preferences, and equipment available (Table 4).

### Limitations and Future Research

The proposed protocol may have specific limitations. For example, some of the recommendations are based on information focusing on sedentary occupations that involve repetitive movements that may be similar to esports, but that does not imply the same mental or physical stress. Moreover, this narrative review approach may be less robust than other literature-reviewing designs (e.g., systematic reviews). Even so, the lack of studies regarding the studied topic was a determinant factor when the review design was chosen. Considering these limitations, future research should focus on experimental studies where the proposed protocols in this article are applied to real settings in a controlled manner (e.g., randomized controlled trials) to assess their effectiveness and limitations. Once these protocols and others with the same goal are tested in high-quality studies, systematic reviews with meta-analyses could be performed to assess the overall results regarding specific protocols to improve health, performance, and well-being of esports players. Meanwhile, practitioners and e-athletes may also apply the proposed protocols in this study during their daily routines, fine-tuning them according to objective and subjective outcomes. Finally, future research may also develop protocols for esports players to prevent other risks they may have apart from the physical ones (e.g., visual strain).

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**Table 2**  Esports Cooldown Protocol Suggestions

<table>
<thead>
<tr>
<th>Cooldown examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Play in a soft, simple, and slow way (i.e., cooldown matches with the teammates or AI).</td>
</tr>
<tr>
<td>• Gentle static stretches (similar exercises to those defined in “flexibility exercises”), followed by a 1-min hold of a posture in which the body and arms are allowed to fall forward while sitting or standing with feet wide apart (i.e., looking for a lengthen feeling in the muscles of the lower back).</td>
</tr>
<tr>
<td>• Breathing slowly in a seated or lying position while quietly thinking about what was done.</td>
</tr>
</tbody>
</table>

**Table 3**  Esports Injury Prevention Protocol Suggestions

<table>
<thead>
<tr>
<th>Muscle/body part</th>
<th>Strengthening</th>
<th>Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk</td>
<td>Suitcase carry</td>
<td>Cat-cow</td>
</tr>
<tr>
<td></td>
<td>Dead bugs</td>
<td>Knee to chest stretch</td>
</tr>
<tr>
<td>Back</td>
<td>Pull ups</td>
<td>Child’s pose stretch</td>
</tr>
<tr>
<td></td>
<td>Barbell row</td>
<td>Cobra stretch</td>
</tr>
<tr>
<td>Shoulder girdle</td>
<td>Overhead press</td>
<td>Cross-body arm swings</td>
</tr>
<tr>
<td></td>
<td>Hands to elbows plank</td>
<td>Cross-body shoulder stretch</td>
</tr>
<tr>
<td>Neck</td>
<td>Holding a neutral neck position while having a resistance band pulling toward a direction (forward, backward, sideways . . . )</td>
<td>Neck side, forward, and back bends</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neck rotations</td>
</tr>
<tr>
<td>Pectoral</td>
<td>Dumbbell fly</td>
<td>Corner pectoral stretch</td>
</tr>
<tr>
<td></td>
<td>Dumbbell pullover</td>
<td>Lacrosse/tennis (hard) ball rolling</td>
</tr>
<tr>
<td>Arm</td>
<td>Biceps curl</td>
<td>Dynamic elbow extension/flexion</td>
</tr>
<tr>
<td></td>
<td>Eccentric triceps extension</td>
<td>Overhead triceps stretch</td>
</tr>
<tr>
<td>Forearm/wrist</td>
<td>Standing wrist extensions/flexions with weightlifting plates</td>
<td>Wrist rotations</td>
</tr>
<tr>
<td></td>
<td>Barbell reverse curls</td>
<td>Wrist flexors and extensors stretch</td>
</tr>
<tr>
<td>Hand</td>
<td>Fingers spread with resistance (i.e., elastic band)</td>
<td>Crossed fingers stretch</td>
</tr>
<tr>
<td></td>
<td>Squeezing a foam ball</td>
<td>Dynamic fingers extension/flexion</td>
</tr>
</tbody>
</table>

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**Figure 5**  — Knee to chest stretch. If pain is noted in the lower back while maintaining or getting to this position, a medical screening is recommended.
Summary

This text has reviewed some of the risks that e-athletes face when they are involved in the competitive esports context. As previously said, these risks could lead to career-ending injuries. To mitigate the possible adverse effects of these risks, this article proposes protocols and activities to include warm-ups, cooldowns, injury prevention exercises, or active breaks. Notwithstanding, all these strategies should be tailored to each esports player. As such, the proposed exercises should only be considered a guide to what should be done. On the other hand, based on the reviewed literature, certain aspects of the protocols might be considered when deciding the activities done during them.

In this regard, the warm-up routine, which has the goal to optimize the following performance, may include a brief bout of aerobic exercise with a low intensity, a stretching part in which dynamic mobility exercises are done, and exercises that are specific to the activity that will be done (in this order), focusing on the parts of the body that are involved in the esports actions. Moreover, the activities should mimic the movement patterns and the skills used in the esports training or competition, improving confidence and competency.

Cooldowns may be done with e-athletes to improve recovery and injury prevention after a training or competition session. The main components of the protocol involve the execution of the activity of the main session in a smoother way, soft stretches, relaxing postures, and a bout of time focusing on slowly breathing and reflecting on the previous session.

Most of the injuries sustained by esports players may be similar to those developed in sedentary occupations involving repetitive movements, such as desk jobs or musicians. In this sense, e-athletes may be prone to sustain overuse injuries. The injury prevention protocols developed for esports players could focus on compensatory exercises for this population’s typical anterior dominant posture and strengthening and gaining mobility in the structures that are remarkably involved during the esports competition and training sessions. However, the whole body should be trained so that new imbalances are not created. Finally, training the core is also critical to favor an upright, stable, and balanced posture and prevent chronic injuries.

Finally, active breaks promote better executive function and fewer health risks for esports players. A 6-min active break per hour of gaming may benefit the health and performance of esports players.

Figure 6 — Holding a neutral neck position while having a resistance band pulling toward a direction: forward (a), backward (b), to the right (c), and to the left (d). The exercise can be performed using elastic bands, a pulley…

Figure 7 — Lacrosse/tennis (hard) ball rolling. The exercise can also be performed while standing, rolling the ball against a wall.
Figure 8 — Standing wrist extensions/flexions with weightlifting plates: initial (a), extension (b), and flexion (c) positions. To increase the difficulty, it is recommended to hold the final extension and flexion positions for 2–5 s.

Figure 9 — Wrist flexors and extensors stretch: flexors (a) and extensors (b) stretching positions. If pain is noted in the arms or forearms while maintaining or getting to these positions, a medical screening is recommended.

Figure 10 — Fingers spread with resistance: initial (a) and final (b) positions. To increase the difficulty, it is recommended to hold the final position for 2–5 s.
players. This approach is considered minimum, so more time could be invested in active breaks if desired. Multiple activities may be done during active breaks, but they should suit each context’s needs, preferences, and equipment. It must be stressed that esports players must stop their gaming bout before feeling any discomfort and not play with pain, regardless of whether it is a competition or a training session.

Conclusions

Musculoskeletal injuries and health issues are a real threat to the careers of esports players, and, as such, athletic trainers and players should include evidence-based warm-up, cooldown, injury prevention, and active breaks routines in their regular activity. The training routines should consider playing hours, player’s characteristics, and all the physical and psychological problems that professional video gaming can cause. As in traditional sports, following a structured protocol tailored to the player’s needs and the particularities of the sport (i.e., different types of video games, controllers, etc.) can be a valuable tool to decrease the risk of injury, promote a longer career, and improve the performance of esports players.

Other Recommendations and Additional Resources

The proposed protocols mainly focus on the physical facet of esports performance and injury prevention. Notwithstanding, other aspects may be beneficial in this regard. Some of them will be mentioned in this paragraph. Firstly, adequate sleep may be an essential variable to ensure proper esports players’ performance and health (Bonnar et al., 2019; Szot et al., 2022), and in traditional sports, insufficient sleep may lead to an increased injury risk (Charest & Grandner, 2020). So, an important goal may be to ensure enough sleep for e-athletes. Moreover, proper nutrition and hydration may also be imperative for e-athletes’ health and cognitive functions (Szot et al., 2022). Finally, certain dietary supplements, such as caffeine, may benefit esports performance if taken with a personalized protocol (Szot et al., 2022).

On the other hand, there are other sources of information for esports players regarding a diverse range of topics. In this sense, some organizations share information on different aspects of e-athletes’ performance and health. To name a couple of examples, we propose two websites with YouTube channels: 1HP (https://1-hp.org) and Esports Healthcare (https://esportshealthcare.com).

Acknowledgments

Baena-Riera and Carrani contributed equally to this work.

References


Table 4 Esports Active Breaks Protocol Suggestions

<table>
<thead>
<tr>
<th>Exercise complexity</th>
<th>Activity</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (6 min)</td>
<td>- High-intensity interval training (running, burpees, jumping jacks, cycling . . . . ).</td>
<td>Time +</td>
</tr>
<tr>
<td></td>
<td>- Calisthenics (pushups, planks, squats . . . . ).</td>
<td>Equipment +</td>
</tr>
<tr>
<td></td>
<td>- Flexibility and mobility exercises (they could be the same as in the injury prevention program) combined with breathing and relaxation exercises.</td>
<td>Preparation +</td>
</tr>
<tr>
<td>Medium (6–15 min)</td>
<td>- Brief continuous aerobic exercise (running, cycling, walking . . . . ).</td>
<td>Time ++</td>
</tr>
<tr>
<td></td>
<td>- Brief resistance training circuit (bench press, barbell rows, barbell back/front squat . . . . ).</td>
<td>Equipment +++++</td>
</tr>
<tr>
<td></td>
<td>- Brief games that promote movement, individually or in groups (Twister, do not let a balloon touch the ground, mirroring someone moving [i.e., a teammate or a video] . . . . ).</td>
<td>Preparation +++++</td>
</tr>
<tr>
<td>High (&gt;15 min)</td>
<td>- Moderate duration continuous aerobic exercise (running, cycling, walking . . . . ).</td>
<td>Time +++</td>
</tr>
<tr>
<td></td>
<td>- Moderate duration resistance training circuit (bench press, barbell rows, barbell back/front squat . . . . ).</td>
<td>Equipment +++/+++</td>
</tr>
<tr>
<td></td>
<td>- Moderate duration games that promote movement, individually or in groups (Twister, do not let a balloon touch the ground, mirroring someone moving [i.e., a teammate or a video] . . . . ).</td>
<td>Preparation +++</td>
</tr>
</tbody>
</table>

Impacts on physical performance, mental performance, injury risk and recovery, and mental health.