

# Module 4. Load Individualisation

## Unit 4.1 Introduction

In the context of professional football, individualising training and match loads is of crucial importance.

Football is a team sport with a regular competitive format, which means that we are not aiming for an optimal moment of physical fitness during the season, but rather for the players to have the highest possible performance throughout the entire season. This implies anticipating, controlling, and managing the periods of fitness condition of each player. In order to do that, we need to have a deep understanding of each player (Borresen and Lambert, 2009).

Load individualisation involves creating an **individual profile** for each player in terms of their fitness condition. Our main goal will always be maximising performance in matches, and that's why individual profiles based on competition are created. Each player has their position on the field and tactical role, and this influences the profile. The most important thing is to establish the inherent characteristics of each player (their abilities) and the goals or challenges we want them to develop.

### 4.1.1. Contextual Aspects of Individual Profile

To begin with the **individual profile**, we must consider the player's environment through the following items:

- Player's Training History throughout Her Life. Age is very important, as well as the years of experience in football and its quality. This is relevant because all previous learning experiences will make the player to have a more adaptable profile, with the possibility of a quicker response to different training load stimuli, and with a lower risk of injury. A young player who has barely received basic motor learning, who had few demanding scenarios during their childhood other than competition, will require a slower adaptation process compared to a player with an extensive professional football career.

The player's past injuries are also important for preventing similar situations or, even better, preparing the player for more challenging behaviours.

- Time of the Season Each player responds to loads in an individual way. In this regard, there are more irregular moments in the season that involve significant changes in the loads. Examples include preseason or the beginning of the season, after the Christmas break, or during periods with a high density of matches. Additionally, the context for each player may be different depending on whether they are regularly called up by their national team for training camps and competitions. Therefore, we must understand that

environment from each player's perspective and anticipate how they may respond during these more critical periods.

- Participation and Role within the Team The role of each player is something important and dynamic throughout the season, as it can fluctuate and vary. A player with an important tactical or leadership role is likely to have a higher level of competitive participation. There are also moments when other players assume this role, either due to multiple player injuries or performance and tactical decisions. In these cases, players may experience periods of increased match minutes. On the other hand, there are also players in more secondary roles who accumulate very little competitive load. Here, we should be able to detect and provide the most appropriate preparatory load in anticipation of their participation.
- Mood that Can Affect It is also a key factor for adapting and managing loads. It requires psychological support or the assistance of other staff members to determine, intervene, and make decisions regarding load management.
- Communication with the Medical Team In the case of possible adaptations due to physical discomfort, communication and collaboration with the medical team are important. It is ideal to provide adaptations that are tailored as closely as possible based on the degree, type, or area of the possible discomfort.

#### **4.1.2. Training Load Aspects of the Profile**

We continue with the development of the individual profile. Once we have contextualised the previous aspects, we know that we can determine the player's conditions through the analytical test. This provides us with information about their physical capacities and thresholds. However, what will truly help us in creating this profile is the analysis of matches and training sessions through GPS monitoring (Bourdon et al., 2017).

We know that the values of external load training have a direct impact on matches. Specifically, the high values and the type of efforts made in sessions further away from matches, such as -4MD and -3MD (Modric et al., 2021). We will analyse the registered data of each player in a completed match. It is clear that having a more historical record of each player will make it easier to apply and provide a much more reliable profile.

Although we can attribute value to the position on the field, we know that not all players in the same position have an identical tactical role, nor do they all have similar conditions. In this second aspect, we refer to the different physical potentials of each player that make them unique, and it is these potentials that we seek to optimise.

For this reason, it will be important to have a clear understanding of each player's maximum match values, as well as their averages (Teixeira et al., 2021). This way, we will work with the training loads throughout the week with the goal of reaching or improving the average. And depending on the circumstances, reaching, and surpassing their maximum. All of this will be

approached from a perspective in which the game and the team are the priority, and the most important aspect of individualisation is to enhance each player's capacity, i.e., prepare them to deliver these improvements during matches.

Once we have the individual profile related to matches, we establish the percentages of loads that we aim at on an individual basis. If we determine that in the -3 session of a match, for example, we want to reach 50% of the total High Metabolic Load Distance (HMLD) of matches, we will strive for each player to achieve as close as possible to their individual 50% of this value. Therefore, even though we have a training session that is common to the entire team, we will monitor if they reach the pre-established values. Additionally, thanks to technology that allows us to track in real-time, we will manage any necessary modifications or interventions during the session.

It is likely that more specific tasks will provide more individualised efforts for each player. On the other hand, more generic tasks with similar activities for everyone will provide specific stimuli. In both cases, we must assess the quantity and, above all, the adaptation for each player. For example, if we perform a match-related task, we will provide each player with the stimulus most similar to their individual competition demands. Or, if we do a finishing exercise after a high intensity run, it will be less realistic or specific for all players, both in terms of position and characteristics.

How can we intervene in the detection and management of values to individualise loads and even generate possible alarms? Oliveira et al. (2021) provide a review of multiple variables and measurement possibilities. Below, we will see the most used variables by the FC Barcelona Women's team.

#### Locomotor Variables:

- Total Distance, M/Min. and Player Load For players who are accustomed to playing at a high pace, participating, and moving a lot, we must seek similarities between the training load sessions and the m/min values in terms of intensity. Regarding total distance and player load, we will aim for the established percentages in the weekly load distribution as individually and accurately as possible.
- HSR In addition to generating the volume of metres covered at speeds over 18 km/h, both on a daily and weekly basis, we should also seek peak speed stimuli (75% and 80% of individual maximum speed) for all players. However, we will focus more on players who exhibit these behaviours during matches. We will work on this in a way that, depending on the amount of effort of this nature applied, players can be physiologically regenerated for the competition match. The use of acute:chronic workload analysis will provide crucial support for this control and management.

#### Mechanical Variables:

- Difference between High Intensity Accelerations and Decelerations There is a highly individualised profile in this regard. Although most players are more proficient at

decelerating rather than accelerating in competitive scenarios, each player has a different proportion. This is evident during matches. However, when we perform training tasks, many of them prioritise accelerations. It is important to generate stimuli with adaptations in this regard. We know that decelerations involve significant eccentric muscle activation and are often accompanied by changes in direction. Therefore, we should create similar scenarios throughout the training sessions, preferably those further away from match day. A player who decelerates 50% more than they accelerate in matches should reproduce this mechanism as closely as possible during training.

- Step Balance Calculates the average maximum impact of each step, both on the left and right feet. It provides a strong indication of a player's efficiency in walking and is displayed as a total percentage for each foot. A uniform distribution of 50% across each foot indicates efficient walking. However, if that percentage deviates, the player may require excessive compensation and further analysis to determine the reason for the imbalance.
- Impacts The force (G-forces based on acceleration-gravity) exerted on the ground is calculated. It is considered high intensity starting from 8G. This includes the dynamic stress load, which is the total weighted impacts that the player experiences in a session or match. They include collisions and steps impacts during execution. Each player has different biomechanics (and injury history), and their fatigue levels play a role in how they manage their external load.

### **Metabolic Variables**

- High Metabolic Load Distance (HMLD) Metabolic power considers acceleration and speed to define individual distance profiles and the time players spend at estimated power thresholds. In the case of High Metabolic Load Distance (HMLD), we quantify the distance covered at this energy expenditure threshold. It is an important indicator of overall load, and it will be crucial to manage individualised session load percentages relative to matches. The acute:chronic workload ratio analysis will also provide key support.

### **Internal Load Variables:**

- Wellness and Rating of Perceived Exertion (RPE) Subjective measures of internal load have been shown to be reliable in various studies (Gomez Piriz et al., 2011). In our team, we use the Hooper Index (1995, Image 1) for wellness questionnaires and the Borg Scale (1970, Image 2) for RPE assessment after each training session. RPE is always applied immediately after each session, while wellness is assessed the following day. These indicators help us detect perceptions related to exertion levels, perceived, or cumulative fatigue, the onset of muscle soreness, insufficient rest, or stress accumulation. In situations that may raise concerns, we always manage the information in collaboration with other medical and coaching professionals.

**Image 1: Hooper Index**

The screenshot displays the Hooper Index app interface. It features four columns, each representing a wellness category: Sueño / Sleep, Estrés / Stress, Fatiga / Fatigue, and Dolor muscular / Muscle soreness. Each column has a progress bar at the top and a 7-point scale below it. The scale options are: 1 - Muy muy bien / Very very good, 2, 3, 4, 5, 6, and 7 - Muy, muy mal / Very, very bad. Each option is accompanied by a radio button. At the bottom of each column is a 'Continuar' button.

Source: own elaboration.

**Image 2: Borg Scale**

The screenshot shows the Borg Scale app interface. At the top, there is a header 'RPE' with a back arrow. Below it is a text prompt: 'Valora el RPE / Rate the RPE'. The interface lists 11 RPE levels, each with a radio button: 00 - Descansado / Rest, 01 - Muy, muy fácil / Very, very easy, 02 - Fácil / Easy (selected), 03 - Moderado / moderate, 04 - Algo duro / Somewhat hard, 05 - Duro / Hard, 06, 07 - Muy duro / Very hard, 08, 09, and 10 - Máximo / Maximal. At the bottom is a red 'Salir' button.

Source: own elaboration.

**Other Variables that Aid Individualisation:**

- Observation of the menstrual cycle and its symptoms: tracking using the Ekeep mobile application.

- Monitoring of nutritional assessments.
- Thermography: through the Thermohuman company, thermal images with computer vision of body regions are captured (both data and their representation with avatars). This helps us better understand human physiology and enables us to make decisions to prevent injuries, monitor them, or support the diagnosis of pathologies or injuries.

## Unit 4.2 Goalkeeper's Specific Training

### 4.2.1 Goalkeeper's Evolution in Women's Football

The women's team's list of achievements grows alongside the individual recognition of its players, but many of them did not have the opportunity to play on a women's team until the age of 14 or older. Until that age, they had to play on boys' teams, with the logistical and social difficulties that this implied. As a result, many girls chose to pursue other sports that had more development in the female gender or simply did not play football until they found a team to join. Understanding this underlying issue is important to grasp the challenges that some players or goalkeepers may face, as they did not have the opportunity for specific training until later ages. In the case of goalkeepers, we find an additional problem: the late inclusion of goalkeeper coaches in their development. In other words, women's football has evolved unevenly compared to men's football. The emergence of goalkeeper coaches has also been slower, which has limited the possibilities of specific training for many years. As a reference, we highlight world-class goalkeepers like Sandra Paños (29 years old, FC Barcelona) or Tiane Endler (30 years old, Olympique de Lyon) who did not have a specific goalkeeper coach until around the age of 15 or 16.

Women's football has experienced exponential growth in recent years, bringing with it increased social visibility, greater recognition, and improved training conditions or opportunities. All of this means that girls who play football today can do so under better circumstances, at younger ages, and with the same possibilities for early development in this sport as boys in men's football. As a result, the new generations of players and goalkeepers will be more prepared and better equipped than the current generation.

### 4.2.2 Goalkeeper's Optimising Training

**The goalkeeper's specific training** on the field is mostly optimising training (OT.) In other words, we prepare the goalkeeper to compete through tasks that are performed in a specific environment and with specific elements of the game. We reproduce real situations where decision-making, technical execution, and motor action play an important role in all tasks. Regarding the latter, we cannot talk about structured training (ST) without referring to the synergy that exists among the structures that make up the goalkeeper. Within our preferential simulation situations (PSS), the preferred structure is usually coordinative (technical) and cognitive (tactical.) The remaining structures (conditional, socio-affective, emotional-

volitional, mental, and bioenergetic) are implicit in all tasks, and we can assess them according to the training objectives in each content area.

The **contents** (offensive and defensive) of the goalkeeper's specific training are related to the qualities of OT (movement, fight, jump, or propulsion) and actions on the ball. The structures are interconnected, and the goalkeeper interacts with them, although one may predominate over the others. For example, if we work on the content of aerial play, we know that the specific quality of jumping will occur frequently. The **objectives** are created based on the profile of the goalkeeper we need in our team, and we prioritise some objectives over others. We must also consider the particularities of the group we are coaching, especially with a specific position like that of the goalkeeper.

In practice, when we focus on coordinative preference objectives based on very specific technical gestures and want to increase the presence of conditional aspects, elements of coadjutant training (CT) come into play. For this type of work, external overload elements may be combined with or without cooperation/opposition, with or without decision-making, or specific technical execution instructions. Thus, depending on the nuances we give to the tasks, the preferences of each player's structure will increase.

## Unit 4.3. Optimising Contents and Objectives

### 4.3.1. Offensive Actions

#### 4.3.1.1. Playing with the Feet and Hands

We find actions related to initiating and continuing play with the feet at short, medium, or long distances, such as goal kicks, direct or indirect free kicks, and control-pass sequences. In the case of playing with the hands, we have actions such as throwing the ball back into play, making low passes, or making aerial passes. It is important to work on these actions in an integrated manner with the team, in addition to the specific goalkeeper training, as it allows us to train a greater variety of more realistic and dynamic situations.

Long or Direct Play Our goalkeepers should be able to make long-range kicks and throws with their hands to distances far from the goal. Despite our game being associative, they should have the ability to play a long ball to an area of the field where there is either numerical superiority or equality, with the aim of maintaining possession or creating a goal-scoring opportunity. Sometimes, this superiority occurs in the final third of the field (Z3), and the goalkeepers must be able to deliver the ball from their position on the field, which is usually in zone 1 (Z1.)

Short, Medium, or Associative Game We consider the goalkeeper as the first attacker. That is why they should help the team maintain ball possession as a primary priority. For this reason, they should be prepared to participate in team tasks as players, as it helps them improve their level of play with their feet and be more effective in situations where their feet are under pressure.

The objectives of playing with the feet, as a priority for the cognitive structure, are as follows: initiating and continuing the team's associative play with the best decision-making, identifying superiorities (in close, medium, and far spaces), and scanning before receiving the ball.

We also set objectives that refer to the coordinative structure, such as executing the technical gesture of kicking and throwing with the hands at short, medium, and long distances. Specifically, achieving accurate kicks with the non-dominant leg at distances of around 25-30 metres, and with the dominant leg at distances of 40-45 metres. Serving a side volley after a run with the dominant leg at distances around 50-55 metres. Throwing the ball overhead with the dominant arm at distances of 25-30 metres, and with the non-dominant arm at distances of 20-25 metres.

To work on playing with the feet and hands in a coordinative structure, specific goalkeeper training will be very beneficial (through static opposition and marked control-pass sequences.) This allows us to focus more easily on technical execution. However, if we want to emphasise the cognitive structure in these types of actions, we should involve the goalkeeper in team tasks, so that they can develop their play with the feet and hands with decision-making abilities and more realistic stimuli, such as opposition.

### 4.3.2. Defensive Actions

Some particularities of the goalkeeper are related to the issues they may have with basic techniques due to the lack of specific training at early ages or as a result of the delayed inclusion of the goalkeeper coach in women's football. For this reason, coordinated or technical training becomes especially important. In particular, it is essential to equalise the technical and coordinative mastery of dominant and non-dominant segments to achieve excellence in execution.

We must also consider the physiology and biomechanics of women and their motor control to give greater importance to the development of the technical gesture. This is done because better control of body awareness when executing a technical gesture will increase the chances of success and reduce the risk of injury.

On the other hand, it is important for goalkeepers not to solely perform coordinated or technical actions specific to their position. Generally, such actions are already reproduced in specific goalkeeper training, and we want them to be able to respond to various stimuli, whether specific or non-specific to their position.

#### 4.3.2.1. Blocking, Extensions, Deflections, and Clearances:

To execute any defensive action under the goalposts with precision, we must understand **the basic position** as the body posture that every goalkeeper should adopt in a situation of a shot

on goal. This position focuses on having slightly raised heels, balanced weight on the tiptoes, slightly leaning forward, and a wide leg stance with knees at shoulder height. All of this is accompanied by semi flexed arm positioning, with hands at hip height. In formative football, we often refer to the basic position as the **gunslinger stance**.

Our main objective is for the goalkeeper to be capable of mastering this position even in situations of maximum difficulty.

We can work on the basic position in a primarily conditional structure by using bands or belts that provide resistance to the body position. We can also use bosu balls or unstable platforms that promote imbalance.

Regarding the defensive actions under the goal, we have blocking, extensions, deflections, and clearances. **Blocking** refers to all defensive actions (with and without a dive) where the goalkeeper catches the ball and maintains possession. There are frontal blocks (without a dive) and frontal blocks with a dive, low side stretch, and mid-height side stretch. We also have aerial blocking, which occurs in situations requiring a vertical jump. **Deflections** occurs when the goalkeeper has the ability to redirect the ball towards a safe and intentional area determined by the goalkeeper. **Clearance** is the rejection that cannot be directed intentionally due to the difficulty of the action. Generally, both deflections and clearances are directed in the opposite direction of the ball and can be performed with the foot or hands. Lastly, **extensions** refer to situations where the goalkeeper prolongs the ball in the same direction it is coming from but at a different height.

Our primary objective should focus on the ability to have the feet well planted at the moment of the shot and avoid the aerial phase during the save. Improve all types of blocking (with and without a dive) against increasingly powerful shots, with blocking as the main option. Lastly, the goalkeeper should be able to improve all types of deflections and clearances (with and without hands), directing them towards safe areas.

It's important to note that all these defensive actions can occur with or without a dive. In the first case, an important conditional action for the goalkeeper is **the impulse**.

The goalkeeper's arm span compared to the size of the goal can vary greatly. As a reference, the average height of the Spanish population is around 174 cm for men and 163 cm for women. This means that the goalkeeper must master different types of impulses in addition to the push from a static position. By mastering the impulse preceded by a lateral movement, they will be able to cover distances (in a stretch) that they couldn't reach with an impulse from their current position. This doesn't mean that we will focus on one over the other, but we must provide tools for them to master both types of impulses.

We place great importance on our goalkeepers using the natural leg on the side where they will perform the dive, even in situations preceded by that necessary lateral movement to reach the limits of the goal in a stretch. The push should always be done with the leg on the outside, regardless of whether it is for a mid-height stretch or a low interception.

Our goalkeepers need to master different types of impulse from static or moving positions.

We can work on the impulse force conditionally using bands or belts that provide resistance in the opposite direction to the stretch that will be executed. And in a more coordinated and cognitive manner, through bosu balls, steps, cones, or markers on the ground that require conditioning the foot placement at the moment of the impulse, whether to improve it or to replicate adverse situations that cause specific adaptation.

### Image 3: Impulse force



Source: own elaboration.

### Movements, Incorporations and Turns

In addition to the actions manifested in the specific quality (SQ) of movement, the goalkeeper must work on specific movements inherent to their playing position. These movements can occur separately or in combination, depending on the defensive action that occurs during the game.

### Repositioning in Goal

These are all the movements that occur when the goalkeeper needs to move to a specific position or location in the goal to defend a shooting situation. They involve lateral, backward, or forward runs conditioned by the position of the ball. Depending on the distance covered, they can be classified into 3 types:

- **Short-range:** Generally, we use high-frequency lateral, frontal, or backward runs with a high frequency of steps. These are usually shorter distances where the ball changes from one profile to another and the shooting situation is very close. Since the ball usually arrives quickly, the goalkeeper must be prepared to intervene and move while maintaining the basic position throughout the ball's trajectory.
- **Medium-range:** We apply lateral, frontal, or backward runs with a medium frequency of steps and greater amplitude. Since the ball takes longer to reach, lateral movements

can be initiated with a wide cross step to shorten the distance of the goalkeeper's lateral run.

- **Long-range:** We utilise natural forward or backward runs with some acceleration and deceleration. Lateral running is not commonly used over long distances. Since the ball takes a long time to reach the goalkeeper's position, it is important for the movement to be natural until the moment of the shot.

Our objective should focus on the goalkeeper mastering the different types of specific movements excellently and knowing how to apply them at the appropriate moments in the game.

### **Incorporations**

These are the movements that occur after a dive, fall, or situation where the goalkeeper ends up on the ground to regain a specific position.

These movements help intervene in rebounds or opportunities for secondary defensive actions. They can range from movements similar to a lateral crawl to reach a nearby ball that wasn't successfully blocked in a dive, to a complete incorporation from the ground to the basic position.

Our objective is for the goalkeeper to be able to choose the best execution for incorporating in different game situations and depending on where the ball is deflected.

### **Turns or Changes of Profile**

These occur in situations where there is a change in body position during defensive actions or shots. They are usually performed while maintaining the basic position all the time. For example, a pass back from the end line requires a turn or change of profile to defend a subsequent shooting action from the box.

The goalkeeper must be able to change their body position through turns that do not cause imbalance in order to intervene in future actions.

### **Gesture Speed, Reaction Speed, and Activation Level:**

Execution speed is crucial in any movement, incorporation, or turn performed by the goalkeeper, as they must be able to generate all types of actions with a high degree of gesture speed.

**Gesture speed:** For goalkeepers, the ball is a moving object with a specific direction and speed, so they cannot arrive late to its trajectory or point of contact. If they had a greater arm span, they would not need to move before the impulse and would reach tight balls with a simple static push. However, in general, this is not the case, and they must execute the preceding movement before the impulse to maintain their chances of reaching the ball. If the movement were slow,

their opportunities to make contact with the ball would be further reduced. Therefore, it is of great value to work on integrating gesture speed and mastery of the technical gesture, so that excess or lack of gesture speed does not affect the correct technical execution.

Our goalkeepers must be capable of executing specific movements with speed, control, and efficiency.

**Reaction speed:** Work on reaction speed should involve providing the goalkeeper with as many stimuli as possible. It is trained both in isolated gesture speed (in a static position) and in an integrated manner (in motion) so that they can react to a moving object in various situations. We should be able to work with different ball speeds towards the goalkeeper and with situations where there is little body preparation for the shot, to increase uncertainty even more.

Our objective should focus on continuing to train reaction speed as a primary and secondary component in most of the training tasks.

Next, we will talk about the **level or activation capacity** of the goalkeeper. This capacity refers to the cognitive structure of training but also affects other components, particularly the ones mentioned above. In relation to the **activation level**, we understand it as the ability to remain attentive, active, or prepared for a specific situation. We also relate it to the ability to anticipate a game situation that may occur. Therefore, we must consider that our team generally has a higher percentage of ball possession during the match and spends more time attacking on the opponent's field than in our own.

That's why our priority objective is for the goalkeeper to be prepared to have an activation level and participation in the game that will not be constant throughout the 90 minutes. Additionally, they must be capable of intervening in critical situations after having spent a long time without participating in the game or with a very low level of activation and reactivity.

It is important to reproduce this in training through exercises where the activation level varies between tasks, sets, or repetitions. We can also apply it during moments when the goalkeeper participates with the team or make rotations (with the other goalkeepers) that lower the activation level and then quickly raise it again.

For example, if we set up a task for one goalkeeper to perform, their activation level will be different from the other two, who only act as opposition or support for the work carried out by the first goalkeeper. However, if we design a task where all three goalkeepers participate equally (whether competitive or not), it is more likely to find a similar level of activation throughout the series of the exercise. This way, we emphasise the cognitive structure as the preferred one since the ability to concentrate is important for executing a more or less active position.

#### 4.3.2.2. Aerial Play, Crosses, and Set-piece Actions (SPA)

This content encompasses cognitive situations of positioning and placement in the game, as well as conditional actions such as movement and jumping. We will focus on **jumping**.

We need to give a lot of importance to the work of jumping, both in static and dynamic situations, and on one or two feet. We aim for our goalkeepers to have a high jumping capacity to be able to dominate aerial play situations or high shots near areas where their reach does not allow them to reach comfortably without jumping. In these types of actions, disturbances can also occur during the execution, as ball disputes often happen during jumping. They must be able to resist so that the technical action of catching or clearing the ball is not affected by a disturbance.

Considering the phases of the jump (preparation, take-off, airborne phase, and landing or descent), we must ensure that they are able to execute each phase with maximum control and effectiveness. The preparation phase is usually with a more natural body position, similar to the basic stance but with a higher centre of gravity. The take-off should be done with the leg on the same side from which the ball is coming (in the case of a lateral cross), so that the leg on the opposite side can rise vertically, elevating the hip and gaining height in the jump. The airborne phase should be controlled and slightly inclined forward, as completely vertical jumps can lose control in the presence of disturbances, which can affect catching or deflecting the ball. Finally, the landing should be balanced and slightly forward-leaning, avoiding falling with the body weight on the back since it is necessary to secure the catch of the ball and the possibility of initiating a throw or kick.

Our goal is for the goalkeepers to improve their vertical jump from both a static and dynamic position, and to be able to withstand possible disturbances.

To work on jumping with a conditional structure preference, we can use weighted vests, elastic bands, or belts that offer resistance during the jump. To reproduce possible disturbances, fit balls, inflatable defenders (barriers), or real opponents can be used. For improvement, we can use hurdles, although they are not recommended for field work as they can excessively hinder the reproduction of real aerial play situations. If we want to work on jumping and clear punching or catching the ball, we can use balls of different weights or sizes, both for catching and clearing. For cognitive improvement and for the goalkeeper to have good spatial-temporal execution, we can perform crosses with balls of different materials to change the height, speed, and direction with which they reach the goal area, thereby improving their decision-making in coming out.

#### 4.3.2.3. 1v1 Variations

We understand 1v1 as a direct attack situation against the goalkeeper, although we should also include situations of 1v1 + goalkeeper and 2v1 + goalkeeper. These will be numerical disadvantage situations where the goalkeeper must choose the best defensive response, both in terms of communication with the defensive line and cognitive aspects of positioning and placement. These latter scenarios are important because the goalkeeper will often have to close space in different situations. Therefore, they must be able to decide when and how to do it.

Conditional and coordinative structures are also present, as the goalkeeper must be able to maintain a very low centre of gravity position for a variable period and execute that action with appropriate gestural or technical control. Thus, in one-on-one situations, all structures become important, which is why we could say it is one of the most complex and difficult defensive actions to master.

We also find frontal or lateral 1v1 actions. Here, the goalkeeper must maintain their basic stance with a very low centre of gravity and wait for the right moment to cover the shooting space by laterally flexing one leg and opening the arms in a triangle shape from head to feet. We also find 1v1 actions with the possibility of feints or passes. The goalkeeper must maintain the previously mentioned basic position and, in addition, react to a change of direction of the ball or a pass to another player.

Our priority objectives in 1v1 situations focus on interpreting all the disadvantage situations and choosing the best response, particularly in 1v1, 1v1 + goalkeeper, and 2v1 + goalkeeper scenarios. They must have a good ability to control distances and the environment, their body posture, and be able to close the space with respect to the attacker at the right moment.

We can work on 1v1 situations with a conditional priority by forcing the goalkeeper (through close passes) to spend more time defending this type of action. This requires maintaining a very low centre of gravity, even during movement. We can also work on the cognitive aspect if the 1v1 action occurs from different angles and with attackers using different dominant legs. This would require the goalkeeper to determine when and how to close spaces and on which side to shift their body weight to make the intervention.

### **4.3.3. Positioning**

It is necessary to understand the game and all its situations to always adopt the ideal position. In our case, the goalkeeper's involvement in the match is mostly at the offensive level. Therefore, the positioning of our goalkeeper will often be in support of maintaining ball possession.

At the defensive level, the goalkeeper's objective is to prevent adverse situations, which is why their positioning outside the box is important in relation to the game, to prevent defensive

actions closer to the goal. Their positioning should be advanced but not too far from the defensive line. If it is not possible to deter the action outside the area, the positioning inside the area becomes particularly important, which, generally, will be on the bisector of the angle formed by the ball and the goalposts.

Goalkeepers must be capable of having correct positioning in all game situations, especially in defensive actions that occur inside the box. They must also master positioning in set-piece situations and be prepared to always make the best decision.

#### 4.3.4. Communicative, Mental and Attitudinal Aspects

The personality profile we expect our goalkeepers to have should possess specific communicative, mental, and attitudinal traits.

**Communicative:** We need the goalkeeper to have ease in expressing themselves and communicating. They must interpret the game's needs in each situation and effectively convey information to the rest of the players, especially the defensive line. This will allow them to lead the defensive line in all game situations, particularly during set-pieces, and they should be a reference for the team at a socio-emotional level.

**Mental:** Goalkeepers must manage mistakes, as they often result in a detrimental situation for the entire team, not just the goalkeeper. Therefore, an individual mistake frequently affects the group as a whole, but they must be able to coexist with errors without letting it affect their sporting performance.

To ensure that goalkeepers stimulate their level of competition, we must create competitive moments between them or with/against the team. This will generate personal feelings and moods that drive them to continue or not. Thus, we prioritise the emotive-volitional structure and create moments of victory and defeat, which are important for improving error management, among other emotions.

**Attitudinal:** The goalkeeper must be receptive to continuous feedback since specific training occurs in a small group and involves a high degree of coordination, often resulting in constant feedback and correction from the goalkeeper's coach. Additionally, goalkeepers must be bold, courageous, and not fear collisions or contact. This is crucial because they often expose their physical integrity, so they must be daring and willing to take risks.

## Unit 4.4 Periodisation

### 4.4.1 Microcycle Model

**Image 4: Example of the Microcycle in a Week of a Single Match**

+1MD	OFF	-4MD	-3MD	-2MD	-1MD	MD
		Activation	Specific qualities	Activation	Power/activation	
Footwork		Footwork	1V1 and variants	Aerial play, crosses, and clearances	Footwork	
Shooting situations (coo)		Shooting situations (conditional)	Individual technical training	Technical Training Group	Activation in shooting situations (conditional speed)	
		Structural		Structured training / post	Mobility	



Source: own elaboration.

Activación	Activation
Cualidades específicas	Specific qualities
Potencia	Power
Juego con el pie	Footwork
Situaciones de tiro (coo)	Shooting situations (conditional)
1 vs 1 y variantes	1V1 and variants
T.E individual	Individual technical training
Juego aéreo, centros y salidas	Aerial play, crosses, and clearances
T.E. Grupo	Technical Training Group
Activación situaciones de tiro (coond. Vel.)	Activation in shooting situations (conditional speed)
Estructural	Structural
Movilidad	Mobility
EESS/post	Structured training / post
Menor a mayor especificidad de contenidos	Lower to higher content specificity

**MD:** The goalkeeper's efforts during the match are not excessive as their defensive involvement is usually low. Most of the actions they are involved in are offensive plays with their feet or aerial play, crosses, clearances, or SPA. Generally, our team tends to have ball possession and spends most of the time attacking the opposing field rather than defending our own. That's why 1v1 actions and their variations also occur, as opponents often pose a threat through long balls that can lead to these defensive actions. Despite that, the goalkeeper's defensive participation is usually low.

**+1MD:** Since the match efforts have not been excessive, the starting goalkeeper undergoes a normal session and does not engage in recovery training. Sometimes, we even aim to replicate loads similar to a demanding match on this day. Therefore, we replicate game situations involving footwork and shooting situations (through saves, deflections, clearances, and extensions) typical of a match or preferred coordination. The goal is to work on the technique of a specific action.

**-4MD:** The session farthest from the match and following the rest day is usually demanding for goalkeepers in terms of cognitive, coordination, and conditioning aspects. We typically work on game situations involving footwork oriented towards the match and shooting situations using conditional defensive content. These contents can include saves, deflections, clearances, and extensions, which are conditionally trained through movements (including changes in amplitude and frequency of supports), incorporations, or turns. The objective is to increase the training load since the next session can be an MD in the case of double-match weeks, simulating a hypothetical -1MD in terms of efforts.

**-3MD:** This session is usually dedicated to working on 1v1 and its variations, and we allocate time for specific individual training based on the needs of each goalkeeper. The reason is that this session is often marked by larger tasks and real game situations, such as match-type or attacking-defending scenarios. These types of tasks are demanding for players, but not usually for goalkeepers as they replicate match situations. Therefore, we utilise the specific training time to work on demanding 1v1 situations with variations that typically occur in a match. Additionally, while 2 goalkeepers participate in the match, we often work on individual free content with the goalkeeper who is not involved. This way, we can improve aspects more individually and according to each goalkeeper's needs.

**-2MD:** This session is typically characterised by working on aerial play, crosses, and clearances, although we may add other contents that we want to focus on for the upcoming match. Aerial play usually reduces the training load for the goalkeeper as these actions are not demanding, which is why we place this content in the -2MD session. It is important to note that the -1MD session is usually very demanding for the goalkeepers. Additionally, similar to the -3MD session, we aim for specificity with contents that are commonly replicated in a match.

**-1MD:** The session prior to the match is usually demanding for goalkeepers as they participate heavily with the team in competitive and finishing tasks. Therefore, the specific training time focuses on footwork (since goalkeepers are often involved in this aspect during a match) and activation and preparation through shooting situations that stimulate gestural and reaction speed.

The -4MD and -3MD sessions are usually the longest in terms of specific goalkeeper training. The -1MD session also tends to have a longer duration, but it is more focused on team training. Additionally, we must consider that goalkeepers frequently participate with the team in footwork, finishing, and 1v 1 tasks. Therefore, we need to be flexible regarding the contents we want to work on each day and have the ability to adapt them based on who is training with the team. For example, if the goalkeepers are going to participate in a 2v1 weave tasks with the team, it may be beneficial to emphasise 1v1 in the specific training to further focus on that content. Conversely, we may choose to work on a different content where we assume that 1v1 situations will occur during team training. Footwork, for example, is a content that is trained every day since it is included in the +1MD, -4MD, and -1MD specific training sessions, and often in some team tasks during the -3MD and -2MD sessions.

## Unit 4.5 Women's Formative Football

### 4.5.1 Evolution of Women's Football in Formative Stages

The evolution of women's football in all areas in recent years is both a cause and a consequence of the increasing number of women and girls practicing this sport, and their initiation at increasingly younger ages. Not too long ago, football clubs with women's sections or women's clubs had few or only one team in their structure. Here, players of very different ages could come together, with senior players potentially playing alongside those aged 12 and above. In many cases, due to the sociocultural context for women, players started playing football at a later age, around 13-14 years old, and had very little sports or specific football practice during childhood.

However, currently, as a result of societal progress and evolution that has brought changes in the stereotypes associated with women and sports, as well as the support of funding, economic assistance, and media impact, there has been an exponential increase in the number of registered licenses across different age groups. This has made it possible to have a significant increase in the number of teams and categories.

It is important to understand this context and be aware that the differences in opportunities and the years of history in women's football compared to men's football are substantial and influence (or have influenced) the level or starting point in the training process for young female players.

However, in this section, we will start from the current context in which girls and teenagers can compete and train with players of their age in various categories. Specifically, we will focus on the methodology of FC Barcelona, which has four formative teams: two teams for players aged 10-12 competing in mixed leagues in the Catalan second and third division for this age group, one team for girls aged 12-14 competing in the mixed second division of the Catalan league for the U14 category, and one U14-U17 team, primarily composed of U15 players, competing in the Preferente Catalan Female Youth League.

On the other hand, there is also the reserve team, which is part of the club's youth football structure and consists of players aged between 16 and 22. Most of them are in youth age category, although they compete in the senior category, specifically in the Liga Reto Iberdrola, which is the second-tier national league. Therefore, the entire training dynamic resembles that of a semi-professional or high-performance professional team.

### 4.5.2 The Training Process in Youth Stages

According to Malcolm Gladwell's well-known theory presented in his book *Outliers* (2008), achieving excellence in any field requires dedicating 10,000 hours to it.

If we were to focus solely on this quantitative statement and apply it to the context of women's football, we would still be far from reaching that figure before the age of 20. In the context of

FC Barcelona, considering that girls begin playing regulated football at the U9 group (9 years old), they practice about 6 hours per week until the age of 12. Then, it increases to about 8 hours per week during the U13 age group and further increases to 10 hours per week during the U15 age group and 12 hours per week during the U18 age group. We would be around 4,000 hours of practice, not accounting for any breaks due to injuries, before reaching the age of 20.

This volume of practice hours could be increased by starting at an earlier age and adding more training sessions per week. However, we cannot focus solely on this aspect. Furthermore, even though there has been a significant increase in resources and conditions for professional women's teams, resources allocated to women's formative football are still scarce.

Regardless of the importance of achieving a high volume of practice during youth stages, the key is also to plan and find the best way to optimise all the structures that shape a football player. The goal of Optimising Training (OT) is “to stimulate and develop the capacities of the Human Sport Being (HSB) through practice, considering their level of development and physical-cognitive maturation, positional specificity, chronological timing, and the characteristics that define the athlete” (Pons *et al.*, 2020, <https://revista-apunts.com/entrenamiento-en-deportes-de-equipo-el-entrenamiento-optimizador-en-el-futbol-club-barcelona/>.) Therefore, it is necessary to respect their self-structuring. As we know, this practice is carried out through the previously mentioned Preferential Simulation Situations (PSS.) According to Seirul·lo Vargas (2000), the solution lies in presenting these types of situations to players, real situations with high levels of interaction that require the optimisation of certain structures in a preferred manner over others to solve them.

Furthermore, this training model, based on complexity theories, prioritises variability and specificity in stimuli as basic principles.

It seems that repeating tasks under the same practice conditions does not cause the necessary “fluctuations” in the systems involved to modify their state. Instead, models based on the approach of "constant task change" through “variation” in execution conditions would facilitate the necessary perturbations to bring about a change in functionality in the systems involved. (Pons *et al.*, 2020, <https://revista-apunts.com/entrenamiento-en-deportes-de-equipo-el-entrenamiento-optimizador-en-el-futbol-club-barcelona/>)

In other words, the variety of situations will enrich the possibility of continuing to provide random and diverse response situations, as happens in the reality of football (Seirul·lo, 2000.)

On the other hand, the training process, and models of sports learning, like any scientific current, have been influenced by the historical context and the general thinking of the time. As explained by Pol (Pol and Seirul·lo Vargas, 2011), during the 20th century, the athlete's development was influenced by behaviourist theories, which are studies on the mind that were

promoted by psychologist John Broadus Watson. There are also influences from mechanism, which compares any natural reality to a machine and explains it based on models, leading to training methodologies applied using the principle of "divide and conquer." This method involves breaking down problems into increasingly smaller and specific issues, allowing them to be transformed into simpler issues that can be solved more easily. In the world of football, this led to a process of dividing the different parts, so that "we began to understand technique, tactics, physical preparation, etc., as quantifiable, and independent performance factors that could be isolated and trained in a self-sufficient manner" (Pol and Seirullo Vargas, 2011.)

Therefore, within the paradigm that encompasses structured training, which focuses on conceiving the athlete as a more complex self-organising structure, it would not make sense to think of a linear learning model (Pons et al., 2020.) In other words, a model that gradually introduces isolated and linear elements of the idea of the game during different stages, as defended by more traditional and analytical models. During these formative or learning phases in sport, the acquisition of technical skills is initially approached in isolation during the early stages, then tactical aspects are introduced, and finally, the different contents are integrated.

Therefore, we start from these principles that govern the structured microcycle as a training model in FC Barcelona. We will summarise the peculiarities or adaptations of this model within women's youth football in different stages. Additionally, we will address the factors that condition the bioenergetic, conditional, and coordinative structures according to gender.

### **4.5.3 The Player in the Formative Stage**

During the prepubertal years, boys and girls undergo similar growth and maturation, allowing them to follow the same training program. Strength, speed, power, endurance, and coordination develop at similar rates in both genders throughout childhood (Beunen and Malina, 2008.) However, we also know that in the case of girls, the preadolescent growth spurt occurs around the age of 10, and they reach their peak growth around the age of 12, about two years earlier than boys. This leads us to pay more attention to this period in the U9 stage and not in the U11 stage, as is the case in male football (Beunen and Malina, 1988).

Regarding these differences, we will delve deeper into the supplementary training module, focusing more on strength training.

As for the neural system, it is known that its development occurs between 0 and 8-10 years old (up to 95% of neural development has already occurred by the age of 7-8) (Malina and Bouchard, 1991.) Before puberty, therefore, greater neural activation and adaptation can be achieved by focusing on agility, balance, coordination, and taking advantage of increased synaptic plasticity. During these early years, neural stimulation is more critical than muscular hypertrophy, which plays a more significant role in athletic development after puberty (Walters and Read, Estes, 2018.)

Therefore, during this time, if we focus training on cognitive/perceptual aspects, coordination, balance, among others, we stimulate the player at the neural level, and what they learn during

this stage will not be learned in the same way (with the same effectiveness/efficiency) at another age, even if we train them with greater volume or intensity.

All of this reinforces the idea of providing variability of stimuli in the practice of young players at these ages. Furthermore, if we analyse the theories that argue that early specialisation can be counterproductive to a player's later performance by hindering harmonious and balanced physical development or causing overuse injuries or other factors that affect the emotional-volitional structure such as emotional fatigue, stress, or lack of motivation, it would be beneficial to incorporate other types of sports practices in some training sessions. Alternatively, considering that the volume of practice sessions for a specific sport is limited, even if we are not aiming to reach the 10,000-hour mark as mentioned in the theory explained earlier, and unfortunately, the activities/games that children engage in during their leisure time barely require movement, it would be good to somehow introduce additional sessions of another sport.

From the peak growth period, the differences between boys and girls start to become more noticeable. The gain in muscle mass after the peak growth is much more pronounced in boys due to higher androgen concentrations during this stage, whereas in girls, this gain stabilises and is much lower.

Additionally, the percentage of body fat in girls is always slightly higher, but this becomes more pronounced during adolescence. Similarly, there are differences in terms of water content. We can see that boys have more water than girls, especially during adolescence, and we know that if there is more water, it is more difficult to get injured.

On the other hand, there have also been studies demonstrating the existence of biomechanical differences.

Biomechanically, several studies clearly show the difference between men and women in muscle activation patterns during basic motor skills. There are works that examine how gender and fatigue influence control strategies in terms of cushioning or comparing essential movements such as change of direction. During and after sexual maturation, women land and decelerate with less cushioning (less hip, knee, and ankle flexion) (Morencos Martínez, 2020, <https://barcainnovationhub.com/es/aspectos-diferenciales-de-la-fisiologia-femenina-en-los-deportes-colectivos-para-la-monitorizacion-de-la-carga/>)

This can also be related to the well-known higher incidence of anterior cruciate ligament (ACL) injuries in women (Sigward, Pollard, Havens, & Powers, 2012.) Therefore, the quality and quantity of training prior to the peak growth period becomes even more important. We will discuss the importance of strength training in the formative stages in more detail later in the supplementary training section, as it will be the foundation for a successful optimising training program.

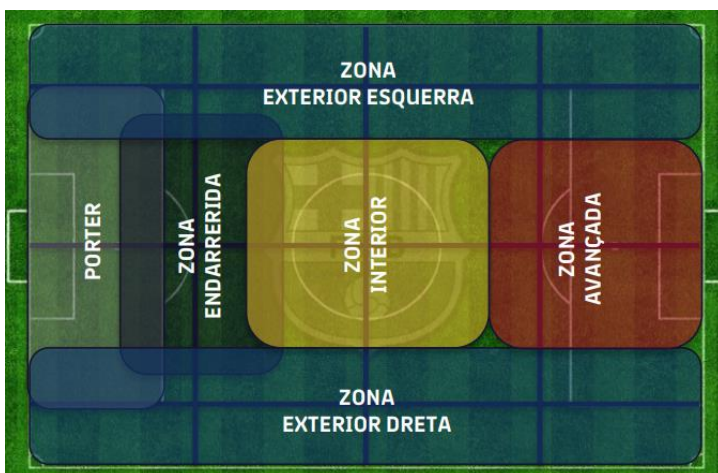
The difficulty or problem is that women's sports are growing at all levels, but we often start with the highest levels (contexts that are more professionalised) and then try to implement this professionalism downward. We find ourselves in a sort of inverted pyramid where many players, due to their talent and qualities, manage to reach the elite level but without a prior training process with sufficient volume and quality to withstand the demands of current competition. Therefore, there is a high number of injuries among young players in high-performance contexts.

#### 4.5.4 Positional Specificity

For players in the U9 age category competing in 7-a-side football, it would be interesting to expand positional specificity to three preferred occupation zones (POZs), which are understood as **static spatial references that highlight the players' locations on the field**, as explained in the "*Idea del Joc*" of FC Barcelona's youth development program. These zones do not refer to the specific player's position within the used game system but rather represent the goalkeeper zone, the back zone (positions occupying the central back area of the field), the inside zone (positions occupying the central area of the field), the outside zone (positions occupying the wing areas of the field), and the advanced zone (positions occupying the advanced central area of the field.) As shown in the following image, these zones are understood in the same way in both 11-a-side and 7-a-side football.

From the children's stage onward, the player's position or role gradually becomes more defined. However, without disregarding the significant transition from playing in a smaller space with fewer players to playing on an 11-a-side field, there is still an interest in ensuring that the player experiences and practices playing in different positions that include, at least, two preferred occupation zones (POZs.) From the U15 age category, where positional specificity is highest, it is reduced to one POZ.

Image 5: Preferred Occupation Zones (POZ)



Source: Exposición formación interna. Documento Idea de juego, 2020.

Zona exterior Esquerra	Outside left zone
------------------------	-------------------

Portería	Goal
zona lejana	Far zone
Zona interior	Inside zone
Zona avanzada	Advanced zone
zona exterior trasera	Outside back zone

The fact that the player does not specialise in a specific position until advanced stages is justified by understanding that practicing in different POZs expands the player's repertoire, enables seamless adaptation to varying game contexts, and optimises the socio-affective structure. The latter enhances empathetic and assertive communication among players, allowing them to experience and understand what their teammates go through during gameplay. Similarly, practicing different positions stimulates the conditional structure differently. The physical demands on a midfielder are not the same as those on a defender or forward. However, these differences between positions are less pronounced in 7-a-side football than in 11-a-side, where greater specialisation in a specific zone is sought.

#### **4.5.5 Didactic Procedures (PSS) Based on the Game Strategy**

To practice the game strategy of FC Barcelona in the formative stages, the didactic procedures carried out, from less to more specificity, are as follows:

On the one hand, there are communicative games that aim to optimise communication among teammates (through passing.) They focus on specific aspects of the position (gesture and profile) and the situation (space and time.) Attention is given to the self-conformation of player structures (especially coordinative, cognitive-socioaffective.) The procedures within this category include:

- Passing game: A pre-established sequence (with variability) of interactions between players through passing in 2x2-4x2 field units (reduced or medium space) with predetermined space occupation and references to the distances between players. Active or passive recovery players may or may not participate.
- Rondos: Practicing interactions between players with short distances between them through passing with one or more players. The objective is to regain possession with players positioned in a very reduced space (<1x1 field unit.)
- Coordination games: Situations of finishing or directionality where interactions are practiced in reduced situations (up to 4 players in 7-a-side and up to 6 players in 11-a-side) in a medium-sized space (<3x3 field units.) For example, waves of 3v2.
- Possession games: Practicing multidirectional interactions that occur continuously and freely in terms of space occupation and movement in a reduced or medium-sized space (<2x2 or 2x2.) Two teams participate with or without neutral players.

- Positional games: Similar to possession games, but in a more reduced space (1x1) with predetermined positions and alternating between all players' locations.

On the other hand, there are competitive games that aim to optimise team communication in a specific game context (positioning and organisation) through the game strategy (redistribution, repositioning, and regain.) These games focus on interactions among players (intervention, mutual assistance, and cooperation.) Within this group, we have:

- Situational games: These involve practicing interactions with optimal distances for the game strategy in a predetermined context (field organisation and area.) Players already occupy a specific zone and adhere to a position. Two teams compete with or without neutral players. The objective is to maintain possession of the ball or reach a specific space. The dimensions are larger (2x1, 1x2, or 2x2 field units) compared to communicative games.
- Matches: This entails practicing interactions in a specific context (field organisation and area) that respects the internal logic of the game. In 7-a-side, a minimum of 5 players are positioned on the team, and in 11-a-side, a minimum of 7 players are positioned.

In addition to these procedures, within the optimising training, circuits or games with a more conditional nature are included to practice different areas of strength (movements, fights actions, ball actions, and jumps.) They are more decontextualised or included in the initial parts of the session as part of activation.

For U11 teams competing in 7-a-side leagues, coaches are advised to allocate a minimum of 15% of total training time to rondos and a minimum of 30% to positional games. In the 11-a-side categories, the aim is to allocate a minimum of 10% to rondos, a minimum of 15% to positional games, and at least 20% to situational games, which includes passing games with a freely determined percentage of usage.

All these procedures, as seen in the structured microcycle module, stimulate the player's conditional structure in different ways. Coaches should take this into account. The objective is not only to design sessions based on the objectives related to the intended game strategy to be transmitted and practiced but also to consider how to modulate or distribute the loads throughout the microcycles. The idea is to optimise the player's conditional and bioenergetic structure in the most specific and suitable way. This prepares them to compete under the best conditions and prevents potential injuries due to mismanagement of training stimuli.

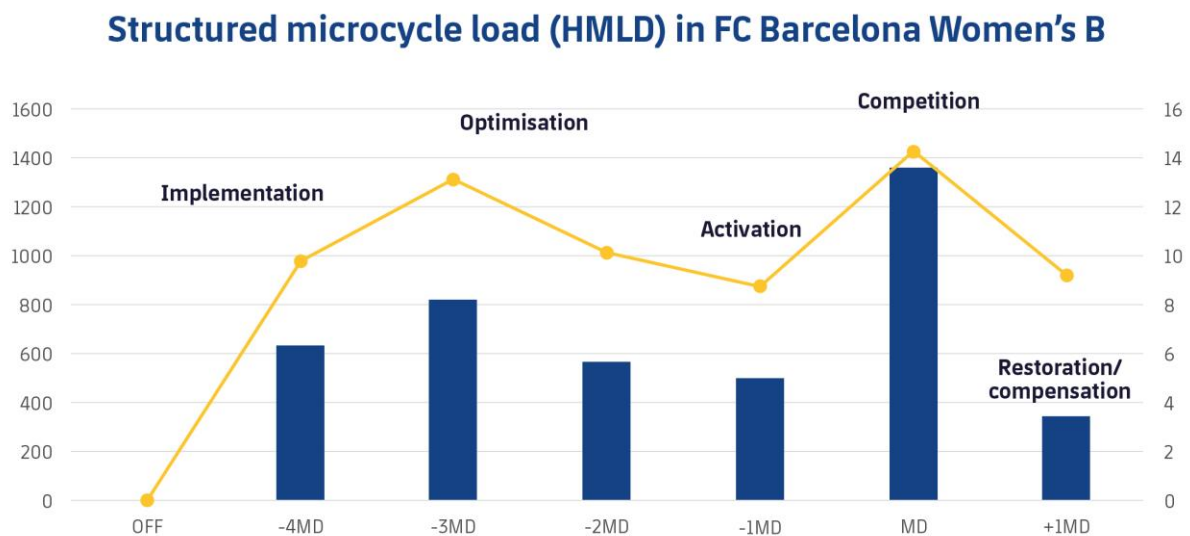
#### **4.5.6 Structure of the Microcycle**

When it comes to the structure of a microcycle in the U11 age group, it does not make much sense to talk about load distribution based on competition days, as the volume and cumulative load throughout the week are not very high. What is important, however, is to ensure variability of stimuli, as mentioned before.

Managing loads becomes much more meaningful as we approach the first team. From the U13-U15 age groups, the training volume increases, which coincides with the characteristics of the players. As we saw earlier, this stage is delicate, especially if the previous training volume or coadjuvant work during the pre-growth spurt stages were low.

In the season of formative teams, microcycles usually maintain their structure since there is no weekly match. In the case of the reserve team, the following dynamics, typical of the structured microcycle and explained in previous modules, are usually followed:

**Image 6: Distribution of Load (HMLD) during the Microcycle in FC Barcelona Women’s B (2022)**



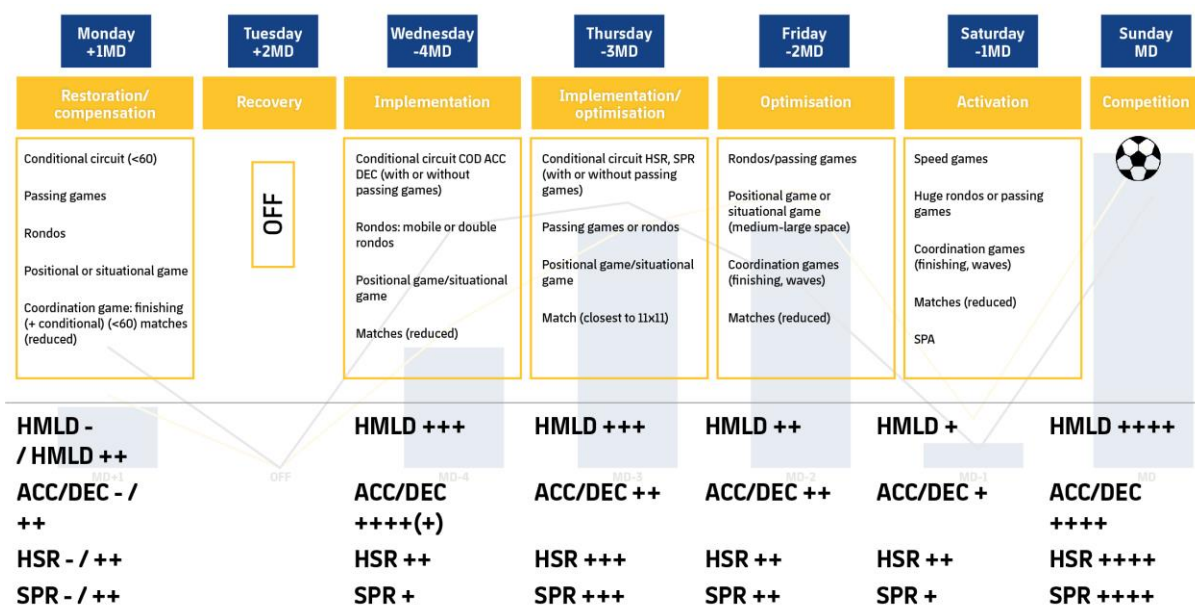
Source: own elaboration.

Carga microciclo estructurado (HMLD) en FC Barcelona Femenino B	Structured microcycle load (HMLD) in FC Barcelona Women’s B
Implantación	Implementation
Optimización	Optimisation
Activación	Activation
Competición	Competition
Restauración/compensación	Restoration/compensation

The U15-U17 team trains one day less (4 days) and the U13 team trains two days less (3 days), so the volume is lower, although the load distribution is adjusted to follow the same idea.

Next, a model scheme is presented to illustrate how the loads are distributed in the reserve team with respect to the different phases of the microcycle and the previously explained didactic procedures or PSS. The different load variables that are prioritised in each session are highlighted.

Image 7: Structured Microcycle Scheme PSS and Load Variables



Source: own elaboration.

Lunes	Monday
Martes	Tuesday
Miercoles	Wednesday
Jueves	Thursday
Viernes	Friday
Sabado	Saturday
Domingo	Sunday
Restauración/compensación	Restoration/compensation
Recuperación	Recovery
Implementación	Implementation
Optimización	Optimisation
Activación	Activation
Competición	Competition
Circuito condicional	Conditional circuit
Juego de pases	Passing games
Rondos	Rondos
Juego de posiciones o situación	Positional or situational game
Juego coordinativo: finalizaciones (+ condicional) (<60) partidos (reducidos)	Coordination game: finishing (+ conditional) (<60) matches (reduced)
Circuito condicional COD ACC DEC (con o sin juego de pases)	Conditional circuit COD ACC DEC (with or without passing games)
Rondos: móviles o dobles rondos	Rondos: mobile or double rondos
Juego de posición/juego de situación	Positional game/situational game
Partidos (reducidos)	Matches (reduced)
Circuito condicional HSR, SPR, (con o sin juego de pases)	Conditional circuit HSR, SPR (with or without passing games)

Juego de pases o rondos	Passing games or rondos
Juego de posición/juego de situación	Positional game/situational game
Partido (lo más cercano a 11x11)	Match (closest to 11x11)
Rondos/juegos de pases	Rondos/passing games
JP o JS (espacio medio/grande)	Positional game or situational game (medium-large space)
Juegos coordinativos (finalizaciones, oleadas)	Coordination games (finishing, waves)
Partidos (reducidos)	Matches (reduced)
Juego de velocidad	Speed games
Rondo gigante o juego de pases	Huge rondos or passing games
Juegos coordinativos (finalizaciones, oleadas)	Coordination games (finishing, waves)
Partidos (reducidos)	Matches (reduced)
ABP	SPA

The objective of working with the youth academy of a club is to optimise the players' performance to enable them to compete in the first team. Therefore, the work in the reserve team (a steppingstone to the first team) where many players are required to play or train with the first team or will soon be fully integrated into the first team, should be aimed at preparing the players in all aspects. The important thing is that they can handle the demands of training and competition in the first team with the utmost confidence. Therefore, efforts should be made to provide increasingly similar loads to those experienced in the context of the first team. It is obvious that it is impossible to completely replicate them due to differences in experience and skill level of the players, the volume of competition (which is much higher for the first team due to their participation in various competitions), resources, and conditions for training at a professional level, and so on.

One solution to expose the players to volumes and intensities of load that are increasingly similar to what they will encounter at the elite level could be to introduce friendly or training matches per week in some microcycles. This way, they can adapt to the stimuli of playing two matches in a week and experience a higher level of competitive load.

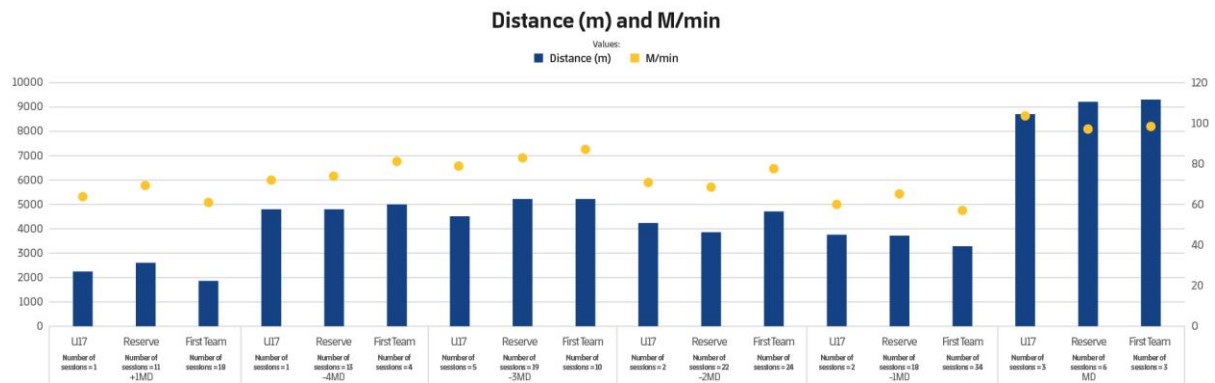
Thanks to GPS technology, which allows us to monitor training and match loads, we can obtain objective feedback or information on how the training process is progressing. In the case of formative football, based on the objective we mentioned, we could use this data to determine if by focusing on the conditional structure, we are generating training stimuli that approximate those encountered in the subsequent age category. This way, we can achieve a progressive adaptation to the demands of training and competition throughout different stages, with the aim of developing players who can reach the first team in the best possible condition without compromising their performance.

The following graphs provide an example of the data we can extract from the main external load variables based on the type of session in the first team, reserve team, and U17 team during

the 21-22 season, from September to mid-March. Except for the U17 team, which did not have GPS technology until December. The reserve team also had a limited number of devices, so the sample size is much smaller both in terms of sessions and the number of participating players. Therefore, the data is not conclusive. Regarding the number of players in the sample, for the first team, it includes all players who participated in the session. For the reserve team, data was recorded for 3-4 players in most sessions and for all participants in some sessions. In the case of the U147 team, the sample consists of only one player in sessions.

For the matches, the first team and the reserve team include all players who played for 90 minutes. In the U17 team, data was only recorded for 4 players who played 80 minutes in one match (matches in this category consist of two halves of 40 minutes.) In the other two matches, data was collected for only one player who played 80 minutes.

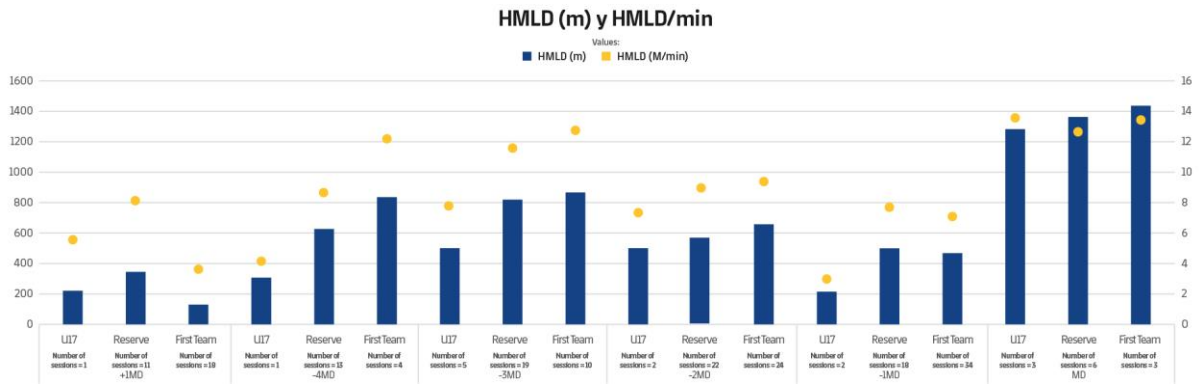
**Image 8: Distance (m) and M/min**



Source: own elaboration.

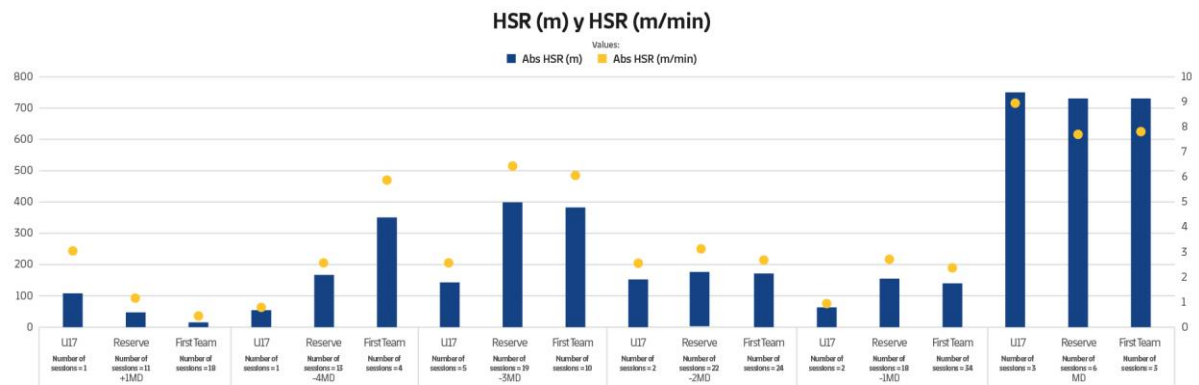
Distancia (m) y M/min	Distance (m) and M/min
Valores	Values
N sesiones	Number of sessions
Juvenil	U17
Filial	Reserve
Primer equipo	First Team

**Image 9: HMLD and HMLD/min**



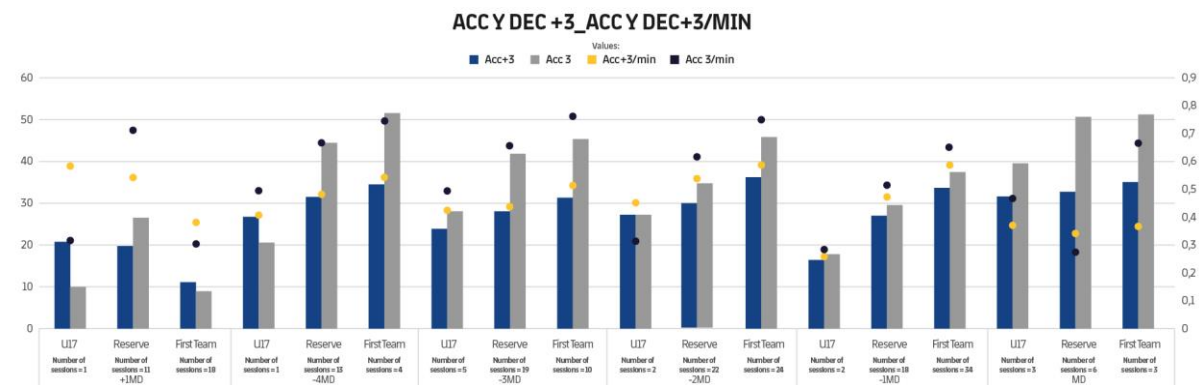
Source: own elaboration.

Image 10: HSR (m) and HSR(m/min)



Source: own elaboration.

Image 11: ACC and DEC+3 and DEC+3/min



Source: own elaboration.

To better interpret the data, it is important to consider that, as explained in previous modules, microcycles in the first team are quite different. Many +1 type sessions are also -2 or -3. In some cases, when there is no midweek competition, double sessions are conducted on the same day. And as we know, the volume of competition is higher when weeks with double matches

are linked, although this is not shown in these graphs, it does influence the dynamics of the loads and the total load to which the players are exposed.

Studying external load through GPS devices is still challenging in lower categories of women's football due to the previously mentioned lack of resources. Nevertheless, it is important that as these resources are implemented, more studies and research are conducted on the external and internal load in women's teams, not only at the professional level but also in the formative stages, to improve the training process, better manage workloads, and ultimately enhance the performance of the players from these stages.

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