Consensus on a netball video analysis framework of descriptors and definitions by the Netball Video Analysis Consensus group

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ABSTRACT

Using an expert consensus-based approach, a netball video analysis consensus (NVAC) group of researchers and practitioners was formed to develop a video analysis framework of descriptors and definitions of physical, technical and contextual aspects for netball research. The framework aims to improve the consistency of language used within netball investigations. It also aims to guide injury mechanism reporting and identification of injury risk factors. The development of the framework involved a systematic review of the literature and a Delphi process. In conjunction with commercially used descriptors and definitions, 19 studies were used to create the initial framework of key descriptors and definitions in netball. In a two round Delphi method consensus, each expert rated their level of agreement with each of the descriptors and associated definition on a 5-point Likert scale (1 – strongly disagree; 2 – somewhat disagree; 3 – neither agree nor disagree; 4 – somewhat agree; 5 – strongly agree). The median (IQR) rating of agreement was 5.0 (0.0), 5.0 (0.0), and 5.0 (0.0) for physical, technical and contextual aspects, respectively. The NVAC group recommends usage of the framework when conducting video analysis research in netball. The use of descriptors and definitions will be determined by the nature of the work and can be combined to incorporate further movements and actions used in netball. The framework can be linked with additional data, such as injury surveillance and microtechnology data.

KEY POINTS

- This is the first consensus process that defines the many components of netball specific activity using a diverse range of experts across physical, technical and contextual aspects of netball.
- This framework provides descriptors and definitions to standardise netball video analysis to improve the consistency of language used within the netball literature and future investigations.
- Video analysis data can be integrated with additional data sources (e.g., injury surveillance and microtechnology data), with confidence.
- The framework could assist in exploring theorical models to better understand movement dynamics and interactions between players (e.g., dynamical systems) in netball to inform injury prevention strategies.

INTRODUCTION

Netball is predominantly played by women and is among the most popular sports for women. Over 20 million people participate in netball, primarily in Commonwealth countries.[1] Netball is played across all ages, at the community level and in semi-professional and professional

leagues in Australia, New Zealand, South Africa and the United Kingdom. Despite the popularity and professional status in some countries, there is limited research on netball compared to other sports.[2] For example, sports such as rugby league and union, with lower participation numbers, (<500,000 and approx. 9.6 million players worldwide), have an established research evidence base.[3-5] Reasons may include increased research interest when the respected sports became professional or the bias towards men's sports in the sports science and sports medicine literature.[6]

Netball is predominantly an indoor court sport, with each team consisting of seven players, each with a specific playing position.[7] It is a high intensity, intermittent game, typically played for 60-minutes, over four 15-minute quarters, with each position restricted to specific court areas.[8] At some levels, netball is played outdoors on various playing surfaces (e.g., asphalt tarmac and artificial turf) and can be played for shorter durations. The physical actions of netball involve repeated jumps, accelerations, decelerations and changes of direction (COD),[9-12] which can expose players to an inherent risk of injury.[13-15] Ankle and knee injuries are the most prevalent injuries in netballers,[13] reported as 5.9 per 1000 player hours in varsity level netballers.[16] In a systematic review of ankle injuries within team sports, the incidence of ankle injuries during netball matches was 45.6 per 1000 person-exposure,[17] the highest of all sports reported. To prevent injuries, the mechanisms of injury need to be established, however the literature either does not provide clear definitions of actions or provides different definitions for the same action. For example, Davidson and Trewartha[18] define shuffling as *"a sideways movement of the body using a shuffling action of the feet";* while, Fox et al.[19] define a shuffle as *"A sideways, backwards, or on-the-spot movement requiring effort and shuffling movement of the feet".* Therefore, the standardisation and comparison between studies is problematic. Additionally, standardised definitions would assist in establishing the characteristics and demands of the game to support the development and use of sport science within the netball.

In other sports, video analysis frameworks are established to ensure consistency when coding match events for performance-based studies and interventions, and to identify injury risk factors and mechanisms.[20-23] For example, Hendricks et al.[24] used video analysis to understand the mechanisms of concussion injuries in youth rugby union to develop training interventions to decrease the risk of sustaining a concussive injury. In elite netball, video analysis has been used to identify landing from a jump as a mechanism for anterior cruciate ligament injuries.[15] Establishing a video analysis framework could assist in consistent reporting (e.g., of injury mechanisms and risk factors), as well as in establishing match characteristics and supporting performance analysis.[22] A recent consensus statement provided standardisation of the key actions and events in rugby union,[22] but similar statements do not

exist for netball despite the popularity of the sport. This is required in netball to ensure consistency in the development of netball-specific evidence-based sports science and sports medicine practices. The netball video analysis consensus (NVAC) group was formed to address the above-mentioned concerns with the aim to establish a framework of descriptors and definitions to improve the consistency and quality of video analysis research in netball.

METHODS

To develop the framework of descriptors and definitions, a two-phase process was used. A systematic review of literature was conducted in phase one, followed by a two round Delphi method consensus process by the NVAC group in phase two. The method used is in line with the previous video analysis framework consensus in rugby union.[22]

In phase one, the literature review was completed per the search terms used within the recent systematic scoping review by Whitehead et al.[2], which returned 957 articles. The search was updated to include papers until 20th April 2022, producing an additional 216 articles. This time-efficient method was used as an extension of the previous review from Whitehead et al.[2], by the same research group. Each publication was manually searched for any descriptors and definitions. Only publications that provided descriptors and definitions relating to the physical (e.g., player movement), technical (e.g., events occurring during match play) or contextual (e.g., additional match circumstances) aspects of netball were included. Nineteen articles were identified as having relevant definitions. These were reviewed by the initial research group (LM, BJ, SW, CJvR, FH) to create the starting framework and definitions. The initial research group discussed any descriptors that resulted in more than one definition in the literature, and a unanimous decision was made to determine which definition to include. Champion Data (Victoria, Australia) provided descriptors and definitions that are used commercially in elite netball. Champion Data is the official data provider to Netball Australia, Netball New Zealand and the timing, scoring and results provider to the Netball World Cup 2015, 2019, and 2023.[25] The initial research group added relevant terms not present in the literature or provided by Champion Data. Any additional terms were required to be agreed upon by the initial research group before inclusion. All definitions and descriptors were categorised into physical, technical or contextual aspects. The initial research group also established sub-categories (Figure 1) for further clarity.

Insert Figure 1 near here

In phase 2, the NVAC group was established. The NVAC group included 15 men and 17 women, senior and less-experienced investigators from a variety of disciplines and different ethnicities. Additionally, the NVAC group included investigators who were black, indigenous, people of colour and LGBTQIA+. The diversity of the group was not prospectively determined and did not consider socioeconomic status or people with disabilities. All experts forming the NVAC group are experienced in or affiliated to netball, or have extensive experience in consensus development. Although no official process was used to form the consensus group, consideration was given to inviting an equal number of experts from each field.[26] In addition, consideration was given to ensure the inclusion of multiple national governing bodies and countries, particularly those well-established within international netball. The research group also aimed to ensure representation of different standards of netball (e.g., international and elite) and different competitions (e.g., Suncorp Super Netball [Australia], ANZ Premiership [New Zealand] and Netball Superleague [United Kingdom]) to encompass any potential variation in terminology used. The expert group included both researchers (*n* = 5; 17%) and practitioners (medical staff [*n* = 5; 17%], netball coaches [*n* = 5; 17%], players [*n* = 3; 10%], performance analysts [*n* = 6; 21%] and strength and conditioning coaches [*n* = 5; 17%]), some of whom hold multiple roles (e.g., player and coach), with their primary role highlighted. The expert group was from various countries including Australia (*n* = 9; 31%), New Zealand (*n* = 3; 10%), South Africa (*n* = 4; 14%), and United Kingdom (*n* = 13; 45%).

A Delphi consensus method[27-29] was then used to develop the framework of descriptors and definitions collated in phase one. Two rounds of data were collected via an online survey (Qualtrics, Provo, USA). For round one, each member of the expert group independently rated their level of agreement for each of the descriptors and its definition within the framework on a 5-point agreement Likert scale (1 – strongly disagree, 2 – somewhat disagree, 3 –neither agree nor disagree, 4 – somewhat agree, 5 – strongly agree). Members of the group were also provided with the opportunity to add any suggestions or comments to the proposed framework, and each of the descriptors and definitions. Consensus was considered to have been reached if ≥80% of the group selected ‘strongly agree’.[28] Any descriptors and definitions that did not reach consensus were rephrased based on the comments, and any suggested additions to the framework were put forward for round two.

In round two of the consensus, a second round of agreement ratings were attained for the revised descriptors and definitions. Consensus was reached for each descriptor and definition if ≥80% of the group selected ‘somewhat agree’ and ‘strongly agree’. The level of agreement reached for each descriptor and definition in round two is reported as median

(Interquartile Range [IQR]). Additional supplementary terms that can be applied to the physical and technical actions to provide further detail are presented within the relevant table (e.g., to describe the direction or intensity of movement).

RESULTS

A total of 19 studies on netball provided physical (Table 1), technical (Table 2) or contextual descriptors (Tables 3 - 6) with definitions which were extracted to develop the framework. Thirty-five of the descriptors and their definition (plus 5 of the supplementary terms) reached agreement after round 1. The remaining 45 descriptors and definitions (and 5 supplementary terms) were re-rated in round two, with the addition of a further 14 descriptors and definitions included in round two following suggestions from the NVAC group made in round one. The median (IQR) rating of agreement was 5.0 (0.0) overall for the physical category; and 5.0 (0.0), 5.0 (0.0), 5.0 (0.0) for the locomotor, non-locomotor and jumping and landings physical sub-categories, respectively. For technical aspects, the overall mean rating of agreement was 5.0 (0.0); and 5.0 (0.0), and 5.0 (0.0) for the attacking and defensive sub-category descriptions and definitions. Within the contextual category, the overall mean rating of agreement was 5.0 (0.0); and 5.0 (0.0), 5.0 (0.0), 5.0 (0.0) and 5.0 (0.0) for the time-based, team information, court areas and additional information contextual sub-categories, respectively. Supplementary terms had overall agreement rating of 5.0 (0.0) (Tables 1 and 2).

Insert Tables 1-5

Insert Figure 2

Insert Table 6

DISCUSSION

This consensus aims to create a framework of physical, technical and contextual descriptors and definitions to standardise and improve the consistency of language used within the netball literature. The NVAC group recommends using these descriptors and definitions when conducting netball research incorporating any physical, technical or contextual element. The descriptors and definitions used should be determined by the aims of the study. Additionally, descriptors and definitions stated in different tables may be combined to

further describe an action or event in netball. For example, to describe a ‘step-change’ in netball, the definitions of ‘step’ (Table 1) and ‘change of direction’ (Table 1) can be combined. The supplementary terms located in Tables 1 and 2 can be applied to the relevant physical (Tables 1) and technical (Table 2) descriptors to provide further detail to the action. For example, the ‘shuffling’ (Table 1) action can be further described as ‘backwards shuffling’ using the direction of movement descriptor components (Table 1). Qualitative descriptive intensity components have been provided and can be applied to relevant physical aspects. Further research is required to provide quantitative thresholds for women athletes using microtechnology units.

The framework of descriptors and definitions can be used to assist with various aspects of netball research and is an important methodological advance for research in netball for return to play from injury/illness/leave, injury surveillance and the sports sciences. Developing a consensus statement defining the most common actions observed in netball contributes to a more stable methodological platform for people to conduct both academic research and practical/clinical experiments. For example, coaches, sports scientists and researchers alike will more easily compare findings, pilot novel interventions with appropriate evaluations and generalise pooled findings to the appropriate levels of granularity. Coaches and performance analysts will be able to map these characteristics across time, while this may allow skill acquisition specialists to improve the skills associated with specific sub-components of performance. Physiologist and strength and conditioning experts can explore mediating factors to these sub-components while refining and evaluating the training process. These data can also be integrated with epidemiological injury data that will inform the medical team. Recommendations and considerations from the NVAC group for the use of the descriptors and definitions to improve the quality of future research and practice are discussed below.

Integration with additional data sources

Video analysis in netball can be integrated with data from external sources, such as injury surveillance and wearable microtechnology data. Video data can supplement injury surveillance data (e.g., count and classification) to provide in-depth information, such as identifying injury mechanisms to further understand the injury risk factors and inform prevention strategies.

The use of wearable microtechnology within elite netball is increasing, with developments in the technology enabling research into the movement characteristics through the use of Local Positioning Systems (LPS) and Inertial Measurement Units (IMU) with accelerometer-

derived ‘load’ metrics at the elite level in Australia.[10 30 31] However, it is limited compared to other team sports such as rugby league, rugby union and soccer which extensively utilise Global Navigation Satellite Systems (GNSS).[4 10 32] Given that netball is played indoors at the elite level, GNSS cannot be used and LPS is required. However, the cost and set up of LPS currently limit its use and practicality across different environments. If the use of LPS continues to grow within elite netball, the locomotor and intensity of movement definitions (Table 1) could be further developed to include objective thresholds. To provide more insight into netball, microtechnology data can be used concurrently with video analysis data to provide further information and context when quantifying the movement characteristics and monitoring of external workload rather than analysing data in isolation.[33] Integration of video analysis data with injury surveillance and microtechnology data will further enhance the understanding of netball and also standardise the reporting of netball literature.

Quality of video footage

While video footage in netball continues to develop in many countries, the quality of video footage varies widely. This may be due to the limited resources and personnel available. Video footage can range from setups with multiple angle options, suitable vantage points and high-quality resolution to compromised setups (e.g., one camera angle with a low vantage point). Additionally, it is not uncommon to have no video footage below the professional level. These limited resources for recording may have a direct impact on analysis. Where possible, matches (and training) should be filmed using at least one camera from behind the goal post from a vantage point that can capture the whole court. If this is not possible, filming can be undertaken from the side of the court in line with the centre circle, from a suitable vantage point. Mount the camera on a tripod for stability and position the lens to have the ball and where possible, at least half of the court in view. All players that can enter the centre third should be in view at the centre pass, as well as the Goal Shooter of the team in possession (and Goal Keeper of the team out of possession). If additional cameras are available, these should be setup to increase the coverage of all players’ movement in and out of possession. Out of possession movement can be important for assessing injury mechanisms and analysing physical demands of the game. The software used to analyse the footage should allow control over the time lapse during the recording to assess movements. Each coded instance should be saved into a database. The recording should allow frame by frame and slow-motion viewing, with the ability to pause and rewind if required for detailed analysis.[34] Furthermore, computer vision techniques using pan, tilt and zoom cameras are emerging, which automatically classify movements and player actions. Therefore, these definitions may help with the emergence of this technology in netball.

Dynamical systems

Video analysis can be used to assist in the use of dynamical systems in team sports.[35] Identifying interactions between players and the opposition based on spatial positioning and recognising patterns within the play and formations can be advantageous.[35-37] Whilst there are developments in research and practical application of dynamical systems in sports, such as soccer,[38] limited research exists on dynamical systems in netball. Recently, a semi-automated process has been used to understand player passing combinations and locations in netball[37] as well as the use of computer vision to define player locations using video footage.[39] Further developments in automated camera systems may also provide accurate external load data, thus providing one integrated system for physical, technical and tactical data. The use of video analysis with dynamical systems in netball is an area of future research, to support performance and assist in understanding injury mechanisms and risk factors. Video analysis can also be used to assist in using dynamical systems to understand skill-based, technical and tactical aspects of training sessions and be combined with microtechnology data and physical demands of training session findings.[10 31] This consensus statement could be used in future research to further inform and develop the use of dynamical systems with video analysis to study complex and dynamical movement interactions in netball.

Limitations

The framework can be applied to all levels of netball and focuses on a sport which is played predominantly by women, including in many low- and middle-income countries therefore has the potential to impact the health of women athletes. The NVAC group includes both athletes and coaches, however, most of the experts currently work in high-performance netball and there is no representation from countries which may be less well resourced. There may thus be potential bias in the recommendations and considerations for the descriptors and definitions within this consensus statement. Consideration was given to include an approximately equal number of experts from each field of work (researchers [*n* = 5; 17%]; medical staff [*n* = 5; 17%]; netball coaches [*n* = 5; 17%]; players [*n* = 3; 10%]; performance analysts [*n* = 6; 21%] and strength and conditioning coaches [*n* = 5; 17%]), multiple national governing bodies and countries, representation of a range of standards within netball and different competitions to minimise any potential limitation. Additionally, given the rapid progression of netball and developments in technology, further descriptors and definitions may need to be added to the framework or updated as netball advances to ensure the framework remains up to date.

Conclusion

The aim of this consensus statement was to create a framework of descriptors and definitions to standardise and improve the consistency of language used within netball literature. The nature of the netball research being conducted will determine which of the recommended descriptors and definitions will be used. Additionally, descriptors and definitions can be combined to provide further details of movements and actions used within netball. The framework can link video analysis data with additional data sources, such as microtechnology and injury surveillance data. This can assist in further understanding injury mechanisms and risk factors in netball, and support sport science research and practice.

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Table 1. Physical aspects descriptors and definitions by locomotor, non-locomotor and jumping and landing sub-categories

Descriptor	Definition
	Locomotor
Walking*	Moving at a speed slower than jogging or running, by placing one foot in front of the other, never having both feet in the air at the same time
Jogging*	Slow running, at a constant pace without sudden acceleration
Running*	Moving at a more rapid pace than walking or jogging, with elongated strides and moments in each step where both feet are off the ground
High speed running**	Moving at a more rapid pace than running, but below maximal speed
Sprinting*	Running at near-maximal, or maximal, speed
Acceleration	A visible increase in velocity
Deceleration*	A visible decrease in velocity
Shuffling*	Repeated stepping and shifting weight to one foot and planting the opposite foot closer to the stepping foot, keeping the feet close to the ground and to each other with minimal displacement of the trunk (e.g., backward or lateral shuffling)
Step*	Planting the opposite foot from the landing foot, where the landing foot remains in contact with the ground until the moving foot is planted
Step-run**	A step where the player keeps the momentum of movement in the direction that they were travelling (e.g., receiving a pass on the move and releasing the ball before the next foot touches the ground)
	Non-locomotor
Standing*	Stationary with no locomotor activity of the lower limbs
Bouncing*	Continuous movement on the balls of the feet, simultaneously or alternately, with the feet remain in contact or close to the ground
Change of direction*	Whole body movement with a sudden change in direction of travel
Dodge*	Deceptive change(s) in direction
Pivot	A movement where the player with the ball swivels either on the heel or on the ball of the landing foot while this foot maintains contact with the ground
Twist*	A movement where a player rotates the body but the foot (or feet) remains fixed (i.e., do not swivel)
Turn in air*	Player rotates whole or part of the body while in the air to land facing a different direction
Roll**	A movement of rotations where the player turns their back to the opposition player to move in a different direction

Collision**	Direct contact by a player on another player, resulting in a visible change in trajectory movement of at least one of the players
	Jumping and landing
Jump*	A movement of vertical and/or horizontal displacement taking off from both feet
Hop	A single leg jump where the landing occurs on the same leg used for take-off
Leap	A single leg jump where the landing occurs on the opposite leg used for take-off
Double leg land*	Landing simultaneously on two feet, at or closer than shoulder width apart, following a jump
Split land*	Landing simultaneously on two feet, further than shoulder width apart, following a jump
Single leg land*	Landing on one foot following a jump
	Supplementary terms – Direction of Movement *(Can be used in addition to physical descriptors)*
Forwards/backwards	Movement in an anterior (forwards) or posterior (backwards) direction relative to the player
Lateral	Movement in a side-to-side (medio-lateral) direction relative to the player
Rotation	Movement about the body's longitudinal axis, resulting in the player facing a different direction
Vertical*	Movement in an upward or downward direction
Diagonal*	Movement that occurs across multiple planes of motion (e.g., at a 45˚ angle, forwards/backwards and lateral)
	Supplementary terms – Intensity of Movement *(Can be used in addition to physical descriptors)*
Low*	Subjective or objective description of the intensity of the movement performed by the player
Medium*	Subjective or objective description of the intensity of the movement performed by the player
High*	Subjective or objective description of the intensity of the movement performed by the player

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Table 2. Technical aspects descriptors and definitions by attacking and defensive sub-categories

Descriptor	Definition
	Attacking
In possession (Attack)	The team with the ball in play at any given time
Two-handed pass	Release of the ball from one player to another player using two hands
One-handed pass	Release of the ball from one player to another player using one hand
Fake Pass	Player makes passing action but does not release the ball
Two-handed catch	Receiving the ball in two hands
One-handed catch	Receiving the ball in one hand
Shot	Directing the ball towards the ring in an attempt to score a goal; restricted to the positions of Goal Shooter and Goal Attack
Goal	A shot at goal during match play that is successful; restricted to the positions of Goal Shooter and Goal Attack
Supershot*	A goal scored from a distance between 3 to 4.9 metres from the post, in the last five minutes of each quarter. Relevant to specific competitions.
Rebound (Attacking)*	The team in-possession regather the ball after an unsuccessful shot on goal
Feed into circle*	A pass from outside the goal circle to a Goal Attack or Goal Shooter that is positioned entirely within the goal circle, that does not directly precede a shot
Feed into circle with shot*	A feed into the circle, that directly precedes a shot
Goal Assist*	The final pass to the Goal Attack or Goal Shooter directly to a goal being scored
Centre Pass*	A restart in play from the centre circle, at the start of each quarter after each goal, taken alternatively by the Centre of each team
Centre Pass Receiver*	The player, of the team in possession, who receives the ball from the centre pass within the centre third
Unforced turnover*	When possession changes because a player on the team in-possession makes an error or infringement that results in a restart in play
General play turnover*	When possession changes team and play continues (e.g., an interception)
Infringement	Action contrary to the rules, penalised by the umpire
Throw-in	A pass from outside of the court to re-start play, after the ball has been deemed out of court by the umpire

	Defensive
Out of possession (Defence)*	The team that does not have the ball at a given time, when the ball is in play
Marking*	Actively defending a play who is in possession of the ball
Off-ball marking*	Actively defending a player who is not in possession of the ball
Interception*	When a player from the team out of possession takes possession via a catch, or a deflection and a pick-up by the same team, from an opposition pass
Deflection*	When a player from the team out of possession of the ball touches the ball and changes the course, motion or speed of the ball
Rebound (Defensive)*	The team out of possession regather the ball after an unsuccessful shot
Pick-up*	When a player from either team secures possession of a loose ball
Loose ball**	When the ball is not in controlled possession by either team but is still in play
Block**	When a Goal Defence or Goal Keeper deflects a shot that prevents a goal
	Supplementary terms – Outcome *(Can be used in addition to technical descriptors)*
Successful	Accomplishing the desired aim or outcome
Unsuccessful	Not accomplishing the desired aim or outcome

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Table 3. Contextual aspects descriptors and definitions by time-based sub-category

Descriptor	Definition
	Time-based
Quarter	A period of play within the match. Options: **Quarter 1** **Quarter 2** **Quarter 3** **Quarter 4**
Half**	A period of play within the match, in which there are 2 halves. Options: **First half** **Second half**
Playing time	The length of time elapsed in a quarter of half, not including stoppages
Extra time	An additional period of time used when the scores are tied at full-time, and a winner is required
Quarters played	The number of quarters a player has taken to the court regardless of the time spent on the court during the quarter
Minutes played	The total number of minutes a player has played the match for
Time in possession (minutes)	The total time each team has possession of the ball while the ball is in play
Time in possession (%)**	The total percentage of time each team has possession of the ball while the ball is in play
Time-out*	Time is paused during a match by an umpire for a designated tactical halt in play, determined by one of the playing teams. Relevant to specific competitions.
Injury stoppage	Time is paused during a match by an umpire due to an injury on court
Other stoppage	Time is paused during a match by an umpire for any reason, other than an injury stoppage or a time-out
Quarter-time**	An interval between Quarter 1 and 2, and between Quarter 3 and 4
Half-time**	An interval between Quarter 2 and 3, or between two halves

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Table 4. Contextual aspects descriptors and definitions by team information sub-category

Descriptor	Definition
	Team Information
Team*	A group of players forming one side in the match
Starting team**	The group of 7 players that take to the court for each team at the start of the match
Player	A member of the team
Substitutions	When a player moves from the team bench to replace a player on court
Team change*	When a player in an on-court position changes playing position
Location	The venue at which the match is taking place. Options: **Home:** The team in question are playing at their own venue **Away:** The team in question are playing at the venue of the opposing team **Neutral:** The match is being played at a venue that does not belong to either of the teams involved
Match standard*	The level of the match taking place. Options: **International:** National representative teams **Elite:** Professional or semi-professional at senior level, or representative at age grade. Highest level of playing standard in a country that has a semi-professional or professional competition. **Sub-elite:** The tier below elite competition, or the highest playing level in countries that do not have a semi-professional or professional competition. **Education:** School, college or university competition **Recreational:** All competition below sub-elite **Other**

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Table 5. Contextual aspects descriptors and definitions by court areas sub-category

Descriptor	Definition
	Court Areas
Goal circle locations*	Refer to Figure 2a. Distance 1 – **Post**: Any shot taken ≤ 1 metre from the goal post Distance 2 – **Short**: Any shots taken >1 metre and ≤ 3 metres from the goal post. These can be categorised as Left, Mid or Right. Distance 3 – **Long**: Any shots taken >3 metres and ≤ 4.9 metres from the goal post. These can be categorised as Left, Mid or Right. Location of the shot is based on facing the goal post
Court locations*	Refer to Figure 2b. NB: the goal circles are not included in the court location areas
Side line	The two longer sides that form the perimeter of the court
Goal line*	The two shorter sides that form the perimeter of the court
Transverse line	Two lines parallel to the goal lines, dividing the court into three equal areas
Goal circle	A semi-circle of radium 4.9 meters, located at both ends of the court, with the centre point being the mid-point of the goal line
Centre circle	A circle 0.9 meters in diameter located in the middle of the court
Goal third*	The area of the court between the goal line and the closest transverse line that contains the goal circle that the team in-possession can shoot within
Centre third	The middle area of the three equal court areas
Defensive third**	The area of the court between the goal line and the closest transverse line that contains the goal circle that the opposing team can shoot within
Court surround**	The area immediately around the court

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Table 6. Contextual aspects descriptors and definitions by additional information sub-category

Descriptor	Definition
	Additional Information
Match outcome	The result of the match. Options: **Win:** The team in question finish the match with more points than the opposition **Draw:** Both teams finish the match with the same number of points **Loss:** The team in question finish the match with less points than the opposition **No Outcome:** There is no official match outcome due to any circumstance
Score	The number of points scored by each team in the match at particular point
Final score	The total number of points scored by each team at the end of the match
Venue*	The type of venue where the match takes place. Options: **Outdoors:** The match takes place outside, fully uncovered **Indoors:** The match takes place indoors, in a fully enclosed venue **Other**
Environmental*	The weather conditions at the match venue, at the start time of the match - **Temperature:** The temperature expressed in degrees Celsius (˚C) **Relative Humidity:** The relative humidity (RH) expressed as a percentage (%RH) **Wind:** The wind speed expressed in kilometres per hour (km/h) **Rain:** The measurement of rainfall expressed in millimetres (mm)
Playing surface*	The type of surface the match is being played on. Options: **Wooden sprung** **Wooden (non-sprung/unknown)** **Vinyl** **Artificial turf** **Rubber** **Concrete** **Grass** **Asphalt Tarmac** **Other**
Medical attention	A player was removed from court for medical attention or medical personnel was required on court to attend to a player
Footwear*	The type of footwear worn by a player. Options: **Court trainer:** trainers specifically designed to be worn on an indoor court **Non-court trainer:** trainers not specifically designed to be worn on an indoor court (e.g., running shoes) **Other**
Time of day	The local time of day the match starts in 24-hour time format (HH:MM: SS)
Competition**	The official name of the league, of the match being played (e.g., Suncorp Super Netball, Netball Superleague)

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529 Figure 1. Chart of the categories, subcategories and descriptors included in the consensus
530
531
532 Figure 2. Diagram of the goal circle (a) and court (b) locations, within the contextual category
533 and court areas sub-category (Table 5)
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