

Player Online Questionnaire- The impact of colour vision deficiency on participation and progression in sport

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Introduction

Colour-blindness or colour vision deficiency (CVD) affects approximately 1 in 12 men and 1 in 200 women, making it more difficult for those with CVD to differentiate between colours. Considering the world is now heavily reliant on colour this must pose problems for individuals with CVD in their day-to-day life, education, work and hobbies. As such, a questionnaire was sent out to explore if athletes with CVD believed that it had had an impact on their participation and progression in sport and life generally.

Methods

A questionnaire was shared with those who participate in sport in the United Kingdom, Portugal, Netherlands, Iceland, Denmark, Spain and Romania to gain an insight into how CVD may have affected people in their sport, combined with what participants think could and has been done to support those with CVD. Table 1 shows the sample size and basic demographic information from the valid responses across countries.

Table 1. Responses by Country and Basic Demographic Information

Country	Sample Size	Biological Sex at Birth	Age Range in Years
United Kingdom	7	7 Males	25-59
Iceland	45	21 Males 24 Females	14-37
Denmark	26	26 Males	14-61
Spain	2	2 Females	28-29
Romania	2	2 Males	42-54

If you are colour-blind, has this affected you in your sport?

County Level Footballer:

"Problem to see teammates, opponents, and the referee. Passed to the linesman!"

UK Spectator:

"Issues with spectating some teams i.e. dark blue/black/red stripes in football are difficult to distinguish"

UK County Level Cricketer:

"Difficult to see red cricket ball out of trees"

Icelandic National Footballer:

"Yes. Gave to an opponent in football when the person was wearing an orange vest, but I was in green. I also gave it to the... wrong person... Difficult to separate this quickly into peripheral vision."

Danish Recreational Footballer:

"Problems seeing differences in exercise equipment"

Romanian Professional Footballer:

"Yes. During the game. If the opponent has a green kit and their opponents are in red it is difficult to distinguish, especially at night."

All participants who indicated that they had some form of CVD indicated that it had impacted on them in sport. This could be due to the equipment, environment, or pitch markings. For example, participants identified particular problems with red and green kit clashes, the use of red cones, cricket balls and a lack of contrast in relation to pitch markings. These same problems also negatively affected participants as spectators, for instance, watching Wales-Ireland play rugby in red and green for those with CVD the kits can look the same. Additionally, some participants identified that their CVD slowed their reaction times and caused them to have problems with gauging space and who is in their peripheral vision, as it takes them longer to identify the kit colours. All of this identifies that the use of colour, particularly colours that are not dissimilar in contrast need to be carefully considered.

Has there been any provision in sport to help you with your colour-blindness and, do you feel this is sufficient?

UK Club Level Cyclist:

"No provision- did not really mention it to anyone"

UK Regional Level Rugby Player:

“Once a coach became aware, there was a short term change then back to using red cones”

UK Recreational Footballer and Skier:

“In training we’d avoid me having to go by cones I couldn’t see. Otherwise no, never asked if difficult during games and if struggling would be subbed off rather than being helped by bibs that would help me see. Skiing nothing in place other than asking for help planning appropriate difficulty route and memorising as piste maps too small to label. Not sufficient at all.”

Interestingly, the vast majority of participants indicated that there was no provision, or none that they were aware of. If there was a change, this change was only made in the short-term. Therefore, provision for CVD in sport needs to be improved greatly and on a long-term basis.

If you do not feel this is sufficient, what other suggestions would you make to improve provision?

UK Regional Level Footballer:

“Biggest issue is kit clashes. Needs always to be dark v light”

UK Footballer:

“A general awareness of the issue from coaches. So they set up with consideration for colour blind players”

Icelandic Professional Footballer:

“Have clear rules for the choice of shirt (dark vs light) and shorts. This applies both in games but also during training (have red, yellow and blue vests, but not yellow/green/orange)”

Danish Recreational Footballer:

“Information for coaches on how to address the challenges”

Collectively, those with CVD identified that awareness of CVD needs to be raised, particularly in terms of kit clashes. For example, they identified that perhaps one team should always wear white, or maybe use patterns rather than just block colours for bibs and kits. Pitch markings should also always be clearly contrasted and the colour of balls in sports should also be considered.

Has having a colour vision issue affected you in other areas such as, education or workplace?

UK Recreational Level Footballer:

“Yes, in both education and employment there is a negative impact any time colour is used as the only means of communication. For example when various line graphs, pie charts, bar charts etc with a colour key are used to communicate information. Any use of red to communicate one thing and green to communicate another thing are impossible to distinguish”

Danish Professional Footballer:

“Yes, I can't be a police officer or a pilot.”

UK County Level Rugby Player:

“Yes. Struggled with the colour spectrum in science at schools and was just seen as being difficult. Colour coded charts etc in work is also just laughed at by colleagues and managers”

UK Cricketer:

“Not permitted to drive on airfields or even consider flying training. More recently lots of trouble in colour-coded reports (red, amber, green).”

Danish Recreational Footballer:

“Problems in distinguishing between the colours in graphs, charts, etc.”

Most participants indicated that, yes, CVD has affected them in other areas, including education, work, hobbies and clothes. For example, some struggled with the use of colours in questions and charts at school, which impacted on their ability to answer questions. Some also identified that CVD prevented them from certain careers including joining the police and becoming a pilot. Others identified that CVD prevented them from carrying out certain tasks at work, such as identifying if colour samples are the same and the use of PowerPoint presentations.

Conclusion

CVD is problematic for spectators and those who participate in sport. For example, it can impact on their ability to distinguish between teammates and opponents, slow their reaction time and peripheral vision efficiency. The general consensus is that CVD can impact on all areas of life including education, work and sport. Sport specifically needs to be more inclusive of CVD in the long-term by raising awareness of CVD and the problems associated with it including kit clashes. The danger is that individuals who face challenges due to CVD may drop out of sport and thus miss out on the physical, psychological and social well-being benefits of physical activity.

If you would like to help develop our knowledge of impact and provision then the questionnaire can be accessed here:

<https://forms.gle/ydp59iwLJDbFaNnq5>