

## Examining Electroencephalographic Activity Differences Between Goalkeepers and Forwards in Professional Football Players

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**Abstract :** Introduction: The investigation of brain activity in sports has become a subject of interest for researchers. Several studies have examined the patterns or differences in brain activity during different sports situations. Previous studies have suggested that the pattern of cortical activity may differ between different football positions, such as goalkeepers and other players. This study aims to investigate the differences in electroencephalographic (EEG) activity between the positions of goalkeeper and forward in professional football players. Methods: Fourteen goalkeepers and twelve forwards, all males between 19-28 years old, participated in the study. EEG activity was recorded while participants were sitting with their eyes closed for 5 minutes. The mean relative power of EEG activity for each frequency band was compared between the two groups using independent samples t-test. Findings: The study found significant differences in the relative power of EEG activity between different frequency bands and electrodes. Notably, significant differences were observed in the mean relative power of EEG activity between the two groups for certain frequency bands and electrodes. These findings suggest that EEG activity can serve as a sensory indicator for cognitive and performance differences between goalkeepers and forwards in football players. Discussion: The results of this study suggest that EEG activity can be used to identify cognitive and performance differences between goalkeepers and forwards in football players. However, further research is needed to establish the relationship between EEG activity and actual performance in the field. Future studies should investigate the potential influence of other factors, such as fatigue and stress, on the EEG activity of football players. Additionally, the use of real-time EEG feedback could be explored as a tool for training and performance optimization in football players. Further research is required to fully understand the potential of EEG activity as a sensory indicator for cognitive and performance differences between football player positions and to explore its potential applications for training and performance optimization in football and other sports.

**Keywords :** football, brain activity, EEG, goalkeepers, forwards

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