CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

J2118

Project Title

The Effect of Concussion Bands Tested at Various Heights

Abstract

Objectives/Goals

We want to know the effectiveness of a concussion band to protect a player from a concussion while playing soccer. We think the results of this experiment will help our community by increasing the awareness of the options available to prevent head trauma. This information will help athletes of all levels by increasing safety.

Methods/Materials

Run the control tests by utilizing a deadfall to release the weight onto the force gauge from preset heights without the use of any protective device. Repeat the same test above but include a sweatband and then a 6mm concussion prevention headband. Test the experiment ten times per height in each category.

1 deadfall (self designed and manufactured)
1 5 pound weight
1 Storelli concussion headband
1 force gauge model HF500
1 Nike sweatband

Results

The impact the headware had in reducing the force measured was clearly observed. For example, when the weight was dropped 2" with no protection it measured 41.15 newtons and with the concussion band it measured an average of 27.84 newtons. Therefore, the concussion band reduced the force by 13.31 newtons. We also noticed the concussion band was more effective as the height of the drop increased. For example, while the force reduction was 13.31 newtons in the 2" tests, the concussion band reduced the force by 18.49 newtons in the same scenario but at the 5" height tests.

Conclusions/Discussion

We hypothesized since the material in readily available concussion bands is designed to absorb impact, their use will reduce more force than using non-specific headwear. Our data supported our hypothesis and provided additional insight. There is enough repetition in our data collection to make valid conclusions. The weight was dropped ten times at four heights for each variable: no protection, sweatband, and concussion band. We minimized the variables before we completed the experiments by designing and building a deadfall. Our data suggests the safety of athletes would increase if concussion bands were worn. Furthermore, the protection offered to the athlete increases with the severity of the impact experienced.

Summary Statement

Our project tests the effectiveness concussion bands have in relation to impact reduction.

Help Received

Allison Birkhead and Collin McCormick