Combine Anthropometric and Physical Performance Predictors of Professional Basketball Rookie Free Throw Accuracy

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ABSTRACT

It is suggested that stronger basketball players and players with larger hands have poorer free throw percentages. However, research suggests stronger individuals have better force steadiness. **PURPOSE**: Therefore, the purpose of this study was to analyze the relationships between free throw percentage and anthropometric and physical performance metrics of National Basketball Association (NBA) players. **METHODS**: Using nbastatR, NBA draft combine data from 2000 to 2020 and respective NBA rookie season player data was scraped. Players who attempted at least 30 free throws were analyzed. Free throw percentage was predicted by the three performance variables and five anthropometric variables: lane agility, bench press performance, and vertical jump height and weight, body composition, height, wingspan, hand length, and hand width. Alpha of 0.05 was used for all statistical analysis. Each variable was correlated with free throw percentage. Multiple regression models were ran and the most parsimonious model was identified. **RESULTS**: There were significant correlations between free throw percentage and the following variables: wingspan (r=-0.4), weight (r=-0.35), hand length (r=-0.34), height (r=-0.32), lane agility (r=-0.24), bench press performance (r=-0.17), and hand width (r=-0.16). The full multiple regression model yielded an R^2 value of 0.20 but the only significant predictor was wingspan (p=0.0164). The most parsimonious prediction model only contained wingspan as a predictor (R^2 =.16, p<0.001). **CONCLUSION**: The strongest predictor of free throw percentage was wingspan, although the relationship strength was weak. When wingspan was accounted for, no other variables were related to free throw percentage. Therefore, the frequent assumption that stronger athletes and athletes with larger hands are poorer free throw shooters is not supported. This relationship does not suggest a causal effect of longer limbs on free throw percentage. Due to the advantage in rebounding and defensive performance, athletes with bigger wingspan have, shorter players with shorter limbs may be required to be more accurate shooters to earn a career in the NBA. However, no research has been done on the effect of limb length to movement accuracy. Future research should investigate the effect of limb length on movement accuracy.