

BMI Changes in High School Football Linemen Transitioning From Senior Year to College

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ABSTRACT: An elevated Body Mass Index (BMI) has been linked to increasing risk factors for developing cardiovascular disease and other life threatening conditions such as diabetes. In addition, the rate of this increase can intensify risk factors and increase the difficulty of weight loss. **OBJECTIVE:** To identify BMI increases among the 2005 graduating class of 5A and 6A high school football lineman as they enter into a Division I college program during the 2006 season. **METHODS:** Rosters from 2005 High School (HS) seniors in the Wichita area and incoming 2006 freshmen in Division I college football programs (COL) were used to retrieve the height and weight of linemen. These values were then used to determine height and weight of the incoming class of 2006 linemen. This data was used to determine the BMI (wt / ht²) of each athlete; comparisons were made between the HS and COL linemen regarding BMI risk factor stratifications. **RESULTS:** A significant difference between all categories was reported, the height difference between the groups was 2 inches (increase of 2.7%, $p \leq 0.05$), weight increased by 34 pounds (increase of 13.3%, $p \leq 0.01$). BMI of lineman increased by 8.4% (28.69 ± 3.71 to 31.31 ± 3.38). **CONCLUSION:** Results suggest that football lineman shifted from a BMI classification of 'overweight' in high school to a classification of 'category I obesity' during their transition from high school to their first collegiate weigh-in. The rapid gain in weight increases the athletes' risk factor levels from low to moderate in a matter of months.

INTRODUCTION

The largest epidemic facing the American healthcare system to date is obesity. Our society has grown increasingly larger from generation to generation and along with that come certain burdens of responsibility whether financial or otherwise. Explanations for this increase include inactivity of all demographics [1], youth diet content [2] and even current technology [3]. An opposite angle to explaining the obesity issue is to look at the emphasis put upon young athletes to be 'bigger' than their predecessors. Professional level sports have displayed trends towards larger and stronger athletes within the last twenty years [4] and youth sports are no different. Athletes in size

related sports such as football have been shown to routinely be in the 75th percentile or above in both height and weight charts within their respective age groups [5]. This is one major sport in which the physicality and strength [6] of an athlete can outweigh one's talent and skill which can lead to an overemphasis on un-natural size and weight gains. The transition from high school to college can be very trying for a young athlete, especially if pressured by a coach to become larger than he/she was previously. Weight gain is typically directly associated with one's freshman year [7] but is compounded for athletes with the growing pressure of coaches and administrators to turn an investment on a scholarship. This is also the time period in which a youth develops habits which will guide them through their adult lives, diet and exercise being two key areas in which these habits form. By tracking weight gain of high school football players into college this research hopes to expose a key characteristic of the nation's health epidemic and to hopefully awaken a culture obsessed with athletic size and strength.

DISCUSSION

This study takes place in Kansas and follows the high school graduating class of 2005 into their first year of college (2006). Rosters from large class high school football programs in and around the Wichita area were accumulated; height and weight data from the 'size' positions (lineman, linebackers, defensive ends) was then recorded (HS). The mean height of these athletes was 72.57 ± 2.3 inches with the mean weight of 215.34 ± 32.4 lbs (Table 1). The same data was then retrieved from two Division I football programs in Kansas (KU, KSU) for the incoming class of 2006 freshmen (COL); mean height was 74.59 ± 2.2 inches while the mean weight was 248.15 ± 32.0 lbs. These results were used to formulate Body Mass Index (BMI) for each athlete within their respective group (HS= 28.69 ± 3.7 , COL= 31.31 ± 3.3).

$$\text{BMI} = (\text{body weight (lb)} \times 703.1) / \text{height (in)}^2$$

Data from the two groups were compared using one-way ANOVA with Tukey's post hoc. Data are expressed as means \pm S.D. Significance was set at $p < 0.05$. The statistical analyses were performed using SPSS (version 10.0.5; SPSS Inc. Headquarters, Chicago, Illinois, U.S.). The results of the BMI calculations were then compared between the outgoing seniors and the incoming freshmen to show any changes in overall body composition (Figure 1). Although height numbers increased slightly, weight measures increased to a level that raised the classification of the athletes from 'overweight' into the 'obese' stratification. This jump came with a higher risk of cardiovascular disease as well as predictors for diabetes and other such problems according to the National Institute of Health [8]. The data also displays an alarming amount of weight gain in the mean of the data, nearly 35 lbs. was added to these athletes in just under a year's time. The noticeable characteristic of this rise is the amount of physical activity these individuals are performing on a daily basis [9], meaning dietary habits were greatly adjusted. These athletes are performing sport specific movements on a daily basis, usually exceeding recommended activity duration, which means if these eating habits continue after the sport is over the athlete will gain at a very rapid rate. This is the factor that leads to adult obesity and puts the strain on the American healthcare system.

Figure: 1

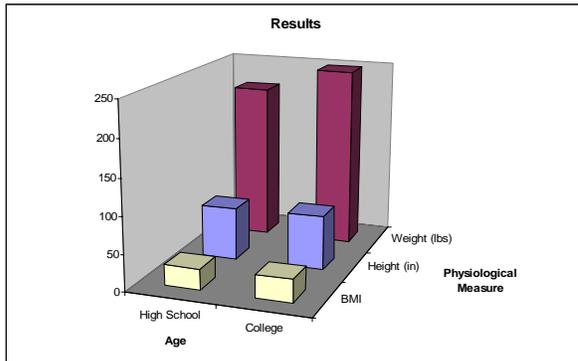


Table: 1

| Measure | High School | College |
|---------------------------|-------------------|-------------------|
| BMI (wt/ht ²) | 28.69 \pm 3.7 | 31.31 \pm 3.3 |
| Height (in) | 72.57 \pm 2.3 | 74.59 \pm 2.2 |
| Weight (lbs) | 215.34 \pm 32.4 | 248.15 \pm 32.0 |

Values presented as means \pm SD.

Conclusions

Results of this study show a significant increase in BMI in football players transitioning from high school to college athletics. The increase in risk

factors for cardiovascular disease and diabetes also exists as the athletes BMI increases. This suggests that without a change in habit or an intervention, the athlete is at an increased risk to develop health problems as a result of the pressures of this size-driven sport. It is worth noting that the authors understand the value coaches, recruiters, and even football fans find in larger players; we simply suggest, based on the rapid increase in weight documented, that players, parents, and coaches should be better educated on the increased risks involved with rapid weight gain.

Acknowledgements

The data from this research could not have been accumulated without the time and effort of the participating high school football programs in the Wichita area. This includes the respective athletic directors, coaches, administrative assistants and athletic training staff. The collegiate statistics were also a direct result of thorough team websites and rosters for which appreciation is extended to the media relations and marketing departments of those respective universities.

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