

8-28-2022

A Comparison of Diet and Physical Activity Behaviors of High School Students in Duval County and Nationally: 2019 YRBS

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Recommended Citation

Luctama, Bethley; Bridges, Sydney; Kol, Kaitlyn; Sparkman, Jack; and Rodriguez, Judith (2022) "A Comparison of Diet and Physical Activity Behaviors of High School Students in Duval County and Nationally: 2019 YRBS," *Florida Public Health Review*: Vol. 19, Article 7.

Available at: <https://digitalcommons.unf.edu/fphr/vol19/iss1/7>

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A COMPARISON OF DIET AND PHYSICAL ACTIVITY BEHAVIORS OF HIGH SCHOOL STUDENTS IN DUVAL COUNTY AND NATIONALLY: 2019 YRBS

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Florida Public Health Review
Volume 19
Published August 28, 2022

Background: Establishing proper physical activity and dietary behaviors during adolescence is crucial because these habits will carry on with the individual into adulthood. Proper physical activity and nutrition reduce the risk of illness and ailments. **Purpose:** Identifying physical activity and dietary behaviors of adolescents in Duval County, FL, and the U.S. nationally. This study examines the differences between the Duval County and national samples using gender and grade comparisons. **Methods:** The study utilized data from the 2019 Youth Behavior Risk Survey for high school students. Analysis was conducted for eight questions encompassing both physical activity and dietary behaviors to examine differences between samples, specifically based on gender and grade. **Results:** The YRBS showed that as grades increased, physical activity for five or more days decreased. Ninth graders in Duval County: 72.7%, 12th graders in Duval County: 75.7%, 9th graders nationally: 50.9%, 12th graders nationally: 60.0%. Females are more likely to be overweight than males. Females in Duval County: 19.6%, Males in Duval County: 13.8%, Females nationally: 17.5%, Males nationally: 14.9%. As grade increased, the number of hours slept decreased. 9th graders in Duval County: 78.0%, 12th graders in Duval County: 87.2%, 9th graders nationally: 71.1%, 12th graders nationally: 83.0%. **Discussion:** For Duval County and the National level, strategies must be implemented to increase the rates of physical activity and improve dietary behaviors of high school students as well as increase physical activity by females and fruit and vegetable consumption by males. However, these interventions are especially important for Duval County where levels of inactivity and fruit and vegetable consumption were lower than at the National level.

Background | Dietary behaviors and physical activity patterns established during adolescence may become similar habits during adulthood (Palomäki, Hirvensalo, M., Smith, K., Raitakari, O., Männistö, S., Hutri-Kähönen, N., & Tammelin, T. 2018). For this reason, youth must begin to practice healthy habits early in life. Habits such as eating the recommended servings of fruits and vegetables, sleeping for an adequate number of hours, exercising regularly and limiting screen time are then likely to become lifestyle habits. Healthy lifestyle habits result in multiple health benefits, such as longevity and lowered risk of various illnesses. One study found that adults who maintained four or five healthy habits over five years had a two and a half times lower risk of cardiovascular disease and mortality than those who maintained an unhealthy

lifestyle (Hulsegge, Looman, M., Smit, H. A., Daviglus, M. L., van der Schouw, Y. T., & Verschuren, W. M. M. 2016).

Given the impact, physical activity and diet can have on an individual in the long term, it is important to explore how behaviors differ across demographics to identify problematic areas. The purpose of this study was to compare physical activity and dietary behaviors by gender and grade in Duval County (DC) high school adolescents to US National data. This study investigated the dietary behaviors and physical activity patterns among adolescents by utilizing the data from the 2019 Youth Risk Behavior Survey (YRBS). Eight different survey questions related to physical activity, diet, sleeping habits, and screen

usage were reviewed. The Social Determinants of Health (SDH) will be used to contextualize the following:

- Is there a difference between physical activity and dietary behaviors by gender?
- Is there a difference between physical activity and dietary behaviors for DC and US National reporting by gender?
- Is there a difference between physical activity and dietary behaviors by grade?
- Is there a difference between physical activity and dietary behaviors for DC and US National reporting by grade?

Literature Review | Lowry, R., Michael, S., Demissie, Z., Kann, L., & Galuska, D. A. conducted a study exploring the associations between physical activity and dietary behaviors among high school students. They found that “Males were highly represented in the cluster with high levels of moderate-to-vigorous PA (MVPA) and low-quality diets, while females were highly represented in the cluster with low levels of MVPA and high-quality diets.” (Lowry, et al, 2015).

Williamson, Dilip, A., Dillard, J. R., Morgan-Daniel, J., Lee, A. M., & Cardel, M. I. found in another study focused on adolescents (aged 13-17) diet habits along with the respective SDH and found that “Socioeconomic status (SES) also significantly influences eating behaviors and low SES is associated with increased risk for obesity.” (Williamson, et al, 2020).

Horodyska, Luszczynska, A., van den Berg, M., Henriksen, M., Roos, G., de Bourdeaudhuij, I. & Brug, J. states, “Inadequate diet is related to an increased likelihood of developing obesity, increased susceptibility to diseases such as diabetes and cardiovascular diseases, reduced immunity, and reduced productivity. Therefore, as suggested by the World Health Organization (WHO) interventions and policies that focus on diet, physical activity, or sedentary behavior are in the main focus of various science disciplines, health organizations, practitioners, and policymakers.” (Horodyska, et al, 2015). The study explored policy and intervention methods and their effectiveness in combatting low levels of physical activity and diet in adolescents they observed. They identify three areas where changes need to be implemented: individual, social, and physical environment (Horodyska, et al, 2015).

Focusing on the implications of physical activity, Pate, Dowda, O'Neill, and Ward utilized a school-based physical activity intervention study to examine changes in physical activity, the difference between

genders, and grades. They found that physical activity declined from 8th grade to 12th grade (Pate, et al, 2007).

A study by Merlo, Jones, Michael, Chen, Sliwa, Lee, Brener, Lee, and Park found that establishing healthy dietary and physical activity patterns among youth is important in public health and prevention of chronic diseases. These findings show a need for multicomponent approaches, including policy and environmental changes to practice making healthy choices. (Merlo, et al, 2020).

In another study among adolescents, Rossett and Heo investigated the relationship between physical inactivity to obesity. Rossett and Heo referred to the 2013 Centers for Disease Control and Prevention (CDC) Youth Behavior Surveillance data “to examine how obesity and trying to lose weight are associated with: (1) <5 physically active days per week with ≥60 minutes physical activity; (2) playing with video computer games ≥3 hours per day on average; (3) no participation in any sports team in the past year; and (4) drinking soda ≥2 times per day.” (Heo, & Wylie-Rosett, J., 2020). They found that obesity was associated with physical inactivity in both genders.

Yu, Jahan-Mihan, Labyak, Sealey-Potts, Christie, Rodriguez, K Patterson, R Patterson, and Seabrooks-Blackmore compared the diets of adolescents in DC health zones using YRBS surveys from 2009, 2011, and 2013. They found that most respondents indicated consuming fruits and vegetables one to three times during the past seven days. There was low consumption of fruits and vegetables (Yu et al., Duval County Health Zone Data; Jacksonville City Council 2019 Charter Revision Commission).

Methods | The Youth Risk Behavior Survey is a part of the Youth Risk Behavior Surveillance System (YRBSS). It is a national health monitoring process of the CDC. It is administered on odd years and has a two-stage cluster design. Both middle schoolers and high schoolers participate in the survey, including students in DC in grades 6th through 12th. This study is specific for DC students in 9th and 12th grade. All their information is anonymous and confidential. The 2019 National YRBS Questionnaire contains 99 questions and the DC YRBS High School Questionnaire contains 91 questions. Questions 1-7 on both surveys pertain to demographics. The survey asks behavior-related questions on drug use, alcohol consumption, sexual behaviors, injuries and violence, diet and nutrition, and physical activity.

This study used the Data Analysis Tool provided by the YRBSS to examine eight different questions related to Diet, Nutrition, and Physical Activity. The

Data Analysis Tool is an interactive tool used to obtain the percentages of males/females and 9th/12th graders who selected yes or no to specific questions. It allows comparisons between DC data and National data.

Results | In this study, the authors analyzed data using the variables gender and grade. They observed data for eight questions from the 2019 YRBS survey for adolescents in DC and US National (Table 1).

The first YRBS question identified individuals who were not active for at least 60 minutes per day on five or more days the week before taking the survey. The data illustrates that DC (74.1%) had almost 20% more adolescents who were not physically active on 5 or more days compared to National (55.9%). For both DC and National data, it was found that the percentage of adolescents who were not physically active increased with grade level and females tended to be less physically active than males. For DC, 68.7% of males were not physically active on 5 or more days compared to 78.6% of females. For National data, 47.2% of males were not physically active for 5 or more days compared to 64.7% of females (Table 2). For DC, 72.7% of 9th graders and 75.7% of 12th graders were not physically active on 5 or more days compared to 50.9% of 9th graders and 60.0% of 12th graders nationally (Table 3).

The next question relating to physical activity asked students if they did not participate in at least 60 minutes of physical activity on at least 1 day in the week before the survey. For the DC sample, 29.6% of females and 23.8% of males did not participate in physical activity for at least 1 day. For National data, 19.6% of females and 14.4% of males did not participate in physical activity for at least 1 day (Table 2). There was about a 10% difference between DC (26.9%) and National (17.0%) totals for those who did not participate in physical activity for at least 1 day. Again, in both DC and National data, the percentage of adolescents who are not physically active increased with grade level, and females tended to be less physically active than males. For DC, 27.4% of 9th graders and 27.8% of 12th graders were not physically active on at least 1 day compared to the 13.6% of 9th graders and 19.7% of 12th graders nationally (Table 3).

The next question identified adolescents who did not play on at least one sports team during the 12 months before the survey. Females who did not participate in a sport for DC were 57.4% and 45.4% nationally, whereas males who did not participate in a sport in DC were 53.0% and 39.8% nationally (Table 2). The total percentage of individuals who did not play on a sports team for DC is 55.0% compared to 42.6% nationally. In both National and DC data, the percentage of individuals not participating in a sport increased with

grade and more females did not participate in a sport than males. Also, 38.1% of 9th graders and 50.2% of 12th graders in the DC sample did not participate in a sport compared to 9th graders, 53.5%, and 12th graders, 60.9%, nationally (Table 3).

The last physical activity-related question was the number of adolescents who played video or computer games or used a computer 3 or more hours per day. It was found that 41% of youth in the DC sample and 46% of youth nationally spent 3 or more hours on a computer/video game. In addition, 38% of females in DC and 44.6% of females nationally played video or computer games or used a computer 3 or more hours per day compared to the 44.9% of males in DC and 47.5% of males nationally (Table 2).

For the YRBS question identifying adolescents who did not eat fruit or drink 100% fruit juices during the 7 days before the survey was analyzed 11.3% of students from DC did not eat fruit compared to 4.9% nationally. More males (14.1% in DC and 7.7% National) did not eat the fruit in comparison to females (8.6% in DC and 4.9% National) (Table 2). Consumption of fruits and fruit juices decreased with increasing grades for both DC and nationally (11.3% in DC and 6.3% National) (Table 3) and for vegetables (12.1% in DC and 7.9% National) (Table 3).

The second diet question asked how many adolescents did not eat vegetables in the 7 days before the survey (green salad and potatoes—not including French fries, chips, or fried potatoes). The results for vegetable consumption followed the same pattern for fruit consumption. Data suggest that more adolescents in DC (12.1%) did not consume vegetables in comparison to National (7.9%). It was found that more males (15% in DC and 9.4% National) did not eat vegetables in comparison to females (9.3% in DC and 6.3% National) (Table 2).

To gauge the overall impact of dietary behaviors, this analysis compares percentages of adolescents, for National and DC, who responded to a question about being overweight (students greater than or equal to 85th percentile but less than 95th). Totals matched up approximately even (DC at 16.7% and 16.1% for National). However, more females (19.6% for DC and 17.5% for National) were overweight than males (13.8% for DC and 14.9% for National) (Table 2).

The final question pertained to the number of adolescents who did not get 8 or more hours of sleep on average. For DC and National data, the number of individuals not getting adequate sleep increased with grade. For DC, 78% of 9th graders and 87.2% of 12th graders did not get adequate sleep. Nationally, 71.1%

of 9th graders and 83% of 12th graders got adequate sleep (Table 3).

Discussion | Males and females in DC high schools had higher levels of physical inactivity than nationally, but inactivity was higher for females in both DC and at the national level. Inactivity also increased with higher grade levels. Identification and implementation of physical activities that are of interest to students of different genders and grade levels both within the school and in community-based settings are needed as are video games with an interactive component that promotes physical activity and especially appeals to males.

This study's finding that nationally and for DC females were less physically active than males aligns with the study by Pate which found that physical activity in adolescent girls decreased as grades increased (Pate, Dowda, M., O'Neill, J.R., & Ward, D. S., 2007). This may be related to level of body satisfaction, perceived athleticism, social appearance, and societal standards regarding athletics for men and women (Ariol, M. 2019; [Csizma](#), K.A., [Wittig](#), A.F., [Schurr](#), K. 1988).

National and DC data also indicate that physical activity decreases as grades increase. This may be related to the added responsibilities upper-class high school students face (e.g., they are more likely to hold jobs and be preparing for life after high school). There is a difference in the number of DC students who are physically active in compared to nationally. This can suggest a lack of access to sports, public parks, or gyms. This relates to the SDH regarding the neighborhood and physical environment - having limited access to parks, playgrounds, or even walkable sidewalks.

As for whether students "did not participate in at least 60 minutes of physical activity on at least 1 day," both the National and DC data show females are less active than males. This outcome may be related to lower social acceptability for females in sports as compared to males ([Csizma](#), K.A., [Wittig](#), A.F., [Schurr](#), K. 1988). Percentages for adolescents who are not physically active are higher in DC than in the National.

The data on whether adolescents "did not play on at least one sports team during 12 months before the survey" indicates that for both National and DC there were more females who did not play on a sports team than males and were not physically active for 60+ minutes on 5 or many days of the week. More female adolescents did not play on a sports team in DC than the National average. Some possible factors may be the level of access and the funding in schools for sports. From the community and social context, DC

may be less likely to have community engagement and social integration.

DC and National data indicated that females played fewer video games than males. The slight decrease in time spent playing computer games or using a computer, three or more hours per day as the grades increase may be related to increased responsibilities and the amount of free time available for gaming. However, more research is needed to examine the correlation between weight and screen time by gender. Kenney conducted a study that found a correlation between obesity and screen time; but the YRBS results indicated females were more overweight than males despite them playing fewer video games (Kenney, E.L., Gortmaker, S.L., 2016).

Males and females in DC high schools had lower levels of fruit and vegetable consumption than nationally but consumption of fruits and vegetables was low for both DC and nationally. DC females had higher levels of overweight despite eating more fruits and vegetables than males. Overweight among DC females needs examination beyond consumption and physical activity to include sleep and stress. Education for students in high schools and as part of extracurricular activities should include weight management, food choice, and healthy preparation of liked fruits and vegetables.

For "did not eat fruit or drink 100% fruit juices during the 7 days before the survey" more males did not eat the fruit in comparison to females. For National and DC there is a slight increase in the percentage of individuals not eating fruit from 9th to 12th grade. DC data shows a decrease in the percentage of individuals not drinking fruit juices in 9th to 12th grade. DC is below the national average in fruit consumption. Yu also found that in DC there is low fruit consumption (Yu, Z., et al 2016).

Similarly, it was found that there was low consumption of vegetables in DC. As grades increase, there is an increase in vegetable consumption. This can be a result of limited educational knowledge of nutrition. Education on the significance of dietary choices and improved food access needs improvement.

Results regarding overweight revealed that for National and DC a higher percentage of females than males were overweight. "Were overweight (Students greater than or equal to 85th percentile but less than 95th)." For National and DC data, the percentage of individuals who were overweight slightly decreased as grades increased. Females are more overweight than males, although they eat more fruits and vegetables. Therefore, more research needs to be conducted on the

causes of overweight, such as stress. Tajik et al. conducted a study and found that females are more overweight than males due to stress (Tajik, E., Zulkefli, N. A. M., Baharom, A., Minhat, H. S., & Latiff, L. A. 2014).

The data showed that for both National and DC data, a large number of females compared to males did not get eight hours of sleep. Similar to physical activity, DC and National data indicate that the percentage of individuals not getting eight hours or more increased as grades increased, and it may be related to an increase in responsibilities.

The data highlights the low consumption of vegetables and fruits in DC. Some applications that can be done to help increase the consumption of vegetables and fruits would be more grocery stores in food deserts, better public transportation, or home delivery services. The lower rate of females' physical activity can be addressed by having public schools accommodate the same number of sports teams for males and females.

At the community level access to healthy food options in schools and nearby areas and safe spaces for a range of different physical activities can be promoted through public policy and action.

Table 1. *Youth Risk Behavior Survey Demographic Characteristics for Duval*

	National	Duval County, FL
<i>Gender</i>	<i>No. (%)</i>	<i>%</i>
Male	6,641 (50.6)	49
Female	6,885 (49.4)	51
<i>Grade</i>	<i>No. (%)</i>	<i>%</i>
9 th	3,637 (26.6)	27
10 th	3,717 (25.5)	26
11 th	3,322 (24.2)	23
12 th	2,850 (23.5)	23
Ungraded		1
Total Sample Size	13,677 (100)	100

Table 2. *Dietary and Physical Activity Behaviors by Gender in Duval and National*

		US National			Duval County, FL		
#	Question	Males	Females	Total	Males	Females	Total
1	Were not physically active for e at least 60 minutes per day on 5 or more days Were not physically active at least 60 minutes per day on 5 or more days	47.2% (44.6-49.9) 6,371	64.7% (62.2-67.2) 6,710	55.9% (53.7-58.1) 13,220	68.7% (66.1-71.2) 1,663	78.6% (76.2-80.8) 2,043	74.1% (72.3-75.8) 3,792
2	Did not participate in at least 60 minutes of physical activity on at least 1 day	14.4% (12.8-16.2) 6,371	19.6% (17.6-21.9) 6,710	17.0% (15.4-18.7) 13,220	23.8% (21.6-26.1) 1,663	29.6% (27.0-32.4) 2,043	26.9% (25.2-28.7) 3,792
3	Did not play on at most lone sports team during the 12 months before the survey	39.8% (36.6-43.1) 4,748	45.4% (42.0-48.9) 4,954	42.6% (39.6-45.7) 9,787	53.0% (50.4-55.7) 1,634	57.4% (54.8-60.0) 2,030	55.0% (53.1-57.0) 3,733
4	Played video or computer games or used a computer 3 or more hours per day	47.5% (45.4-49.6) 6,338	44.6% (42.4-46.8) 6,703	46.% (44.4-47.9) 13,177	44.9% (42.2-47.7) 1,667	38.% (35.7-40.7) 2,058	41.% (39.3-43.3) 3,810
5	Did not eat fruit or drink 100% fruit juices during the 7 days before the survey	7.7% (6.3-9.3) 6,037	4.9% (4.2-5.8) 6,369	6.3% (5.4-7.3) 12,529	14.1% (12.2-16.3) 1,666	8.6% (7.3-10.1) 2,058	11.3% (10.1-12.7) 3,805
6	Did not eat vegetables in the 7 days before the survey (green salad and potatoes—not including French fries, chips, or fried potatoes)	9.4% (8.1-10.8) 5,675	6.3% (5.5-7.2) 5,973	7.9% (7.1-8.7) 11,757	15.0% (13.1-17.2) 1,643	9.3% (7.8-11.0) 2,058	12.1% (11.0-13.4) 3,780
7	Were Overweight (Students greater than or equal to 85 th percentile but less than 95 th)	14.9% (13.5-16.4) 5,964	17.4% (15.7-19.4) 6,176	16.1% (14.9-17.5) 12,140	13.8% (11.9-15.9) 1,657	19.6% (17.5-21.9) 1,984	16.7% (15.2-18.4) 3,641
8	Did not get 8 or more hours of sleep on average	76.2% (74.5-77.7) 6,307	79.7% (77.6-81.6) 6,659	77.9% (76.3-79.4) 13,105	81.0% (78.6-83.2) 1,656	85.2% (83.3-87.0) 2,039	83.0% (81.4-84.5) 3,778



Table 3. *Dietary and Physical Activity Behaviors by Grade in Duval and National*

		US National			Duval County, FL		
#	Question	Grade 9	Grade 12	Total	Grade 9	Grade 12	Total
1	Were not physically active for at least 60 minutes per day on 5 or more days Were not physically active at least 60 minutes per day on 5 or more days	50.9% (47.7-54.1) 3,523	60.0% (57.2-62.7) 2,782	55.9% (53.7-58.1) 13,220	72.7% (69.0-76.1) 1,036	75.7% (71.7-79.4) 685	74.1% (72.3-75.8) 3,792
2	Did not participate in at least 60 minutes of physical activity on at least 1 day	13.6% (11.7-15.9) 3,523	19.7% (16.9-22.8) 2,782	17.0% (15.4-18.7) 13,220	27.4% (24.3-30.7) 1,036	27.8% (23.9-31.9) 685	26.9% (25.2-28.7) 3,792
3	Did not play on at least one sports team during the 12 months before the survey	38.1% (24.6-41.8) 2,608	50.2% (46.0-54.3) 2,073	42.6% (39.6-45.7) 9,787	53.5% (49.5-57.5) 1,024	60.9% (56.8-64.8) 675	55.0% (53.1-57.0) 3,733
4	Played video or computer games or used a computer 3 or more hours per day	46.5% (43.2-49.8) 3,513	45.5% (42.3-48.7) 2,769	46.% (44.4-47.9) 13,177	44.0% (40.1-47.9) 1,036	41.0% (37.3-44.8) 692	41.% (39.3-43.3) 3,810
5	Did not eat fruit or drink 100% fruit juices during the 7 days before the survey	6.0% (4.7-7.7) 3,360	6.5% (5.3-8.0) 2,638	6.3% (5.4-7.3) 12,529	12.4% (10.0-15.3) 1,042	10.6% (7.9-14.2) 685	11.3% (10.1-12.7) 3,805
6	Did not eat vegetables in the 7 days before the survey (green salad and potatoes—not including French fries, chips, or fried potatoes)	8.5% (7.2-9.8) 3,183	7.5% (5.9-9.4) 2,440	7.9% (7.1-8.7) 11,757	14.5% (12.2-17.2) 1,040	10.2% (7.6-13.5) 686	12.1% (11.0-13.4) 3,780
7	Were Overweight (Students greater than or equal to 85 th percentile but less than 95 th)	15.7% (13.7-17.8) 3,196	15.5% (13.6-17.7) 2,598	16.1% (14.9-17.5) 12,140	16.5% (13.8-19.5) 984	15.9% (12.6-19.9) 665	16.7% (15.2-18.4) 3,641
8	Did not get 8 or more hours of sleep on average	71.1% (68.5-73.6) 3,479	83.0% (80.7-85.0) 2,767	77.9% (76.3-79.4) 13,105	78.0% (75.0-80.7) 1,033	87.2% (83.6-90.1) 687	83.0% (81.4-84.5) 3,778

References |

- Ariol, M. (2019) *Differences in Perfectionism, Social Appearance Anxiety, and Body Dissatisfaction Between College Aged Athletes Vs. Non-Athletes*. Publication No. 27546025. Doctoral Dissertation, Barry University. Proquest Dissertations and Theses database. ProQuest Dissertations Publishing, <https://www.proquest.com/docview/2318150092?pq-origsite=primo>
- Csizma, KA, Wittig, AF, & Schurr, KT. (1988) Sport stereotypes and gender. *Journal of Sport and Exercise Psychology*. 10(1), 62-74. <https://doi.org/10.1123/jsep.10.1.62>
- Heo M, Wylie-Rosett J.(2020) Being obese versus trying to lose weight: Relationship with physical inactivity and soda drinking among high school students. *The Journal of school health*. 90(4):301-305. doi:10.1111/josh.12879
- Horodyska, K, Luszczynska, A, van den Berg, M, Hendriksen, M, Roos, G, De Bourdeaudhuij, I, & Brug, J. (2015). Good practice characteristics of diet and physical activity interventions and policies: an umbrella review. *BMC Public Health*. 15(1):19-19. doi:10.1186/s12889-015-1354-9
- Hulsegge G, Looman M, Smit HA, Daviglus ML, van der Schouw YT, Verschuren WMM. (2016) Lifestyle Changes in Young Adulthood and Middle Age and Risk of Cardiovascular Disease and All-Cause Mortality: The Doetinchem Cohort Study. *Journal of the American Heart Association*. 5(1) , e002432. doi:10.1161/JAHA.115.002432
- Jacksonville City Council 2019 Charter Revision Commission. November 8, 2019 Subcommittee Meeting | Urban Services District Duval County Health Zone Data. <https://www.coj.net/city-council/charter-revision-commission> Accessed August 6, 2022.
- Kenney EL, Gortmaker SL. (2016) United States Adolescents' Television, Computer, Videogame, Smartphone, and Tablet Use: Associations with Sugary Drinks, Sleep, Physical Activity, and Obesity. *The Journal of Pediatrics*. 182:144-149. doi:10.1016/j.jpeds.2016.11.015
- Lowry, R, Michael, S, Demissie, Z, Kann, L, & Galuska, DA (2015). Associations of physical activity and sedentary behaviors with dietary behaviors among US high school students. *Journal of Obesity*. May 2015:876524-876528. doi:10.1155/2015/876524
- Merlo, CL, Jones, SE, Michael, SL, Chen, TJ, Sliwa, SA, Lee, SH, ... & Park, S. (2020) Dietary and Physical Activity Behaviors Among High School Students - Youth Risk Behavior Survey, United States, 2019. *Morbidity and Mortality Weekly Report Supplements*. 69(1):64-76. doi:10.15585/mmwr.su6901a8
- Palomäki, S, Hirvensalo, M, Smith, K, Raitakari, O, Männistö, S, Hutri-Kähönen, N, & Tammelin, T. (2018) Does organized sport participation during youth predict healthy habits in adulthood? A 28-year longitudinal study. *Scandinavian Journal of Medicine & Science in Sports*. 28(8):1908-1915. doi:10.1111/sms.13205
- Pate RR, Dowda M, O'Neill JR, Ward DS. (2007) Change in physical activity participation among adolescent girls from 8th to 12th grade. *Journal of Physical Activity & Health*. 4(1):3-16. doi:10.1123/jpah.4.1.3
- Tajik E, Zulkefli NAM, Baharom A, Minhat HS, Latiff LA. (2014) Contributing factors of obesity among stressed adolescents. *Electronic Physician*. 6(1):771-778. doi:10.14661/2014.771-778.
- Underwood, JM, Brener, N, Thornton, J, Harris, WA, Bryan, LN, Shanklin, SL, ... & Dittus, P. (2020). Overview and methods for the youth risk behavior surveillance system—United States, 2019. *Morbidity and Mortality Weekly Report Supplements*. 69(1):1-10. doi:10.15585/mmwr.su6901a1
- Williamson VG, Dilip A, Dillard JR, Morgan-Daniel J, Lee AM, Cardel MI. (2020) The Influence of Socioeconomic Status on Snacking and Weight among Adolescents: A Scoping Review. *Nutrients*. 12(1):167-. doi:10.3390/nu12010167
- Yu, Z, Jahan-Mihan, A, Labyak, CA, Sealey-Potts, C, Christie, C, Rodriguez, J, Seabrooks-Blackmore, JJ, Patterson, K, Patterson, R. (2016) Duval County 2009, 2011, and 2013 Fruit and Vegetable Intake by Health Zone: Data from the Youth Risk Behavior Survey. *Florida Public Health Review*. 13:29-36.