

2013-2014 Student BMI, Physical Examination & Vision Evaluation Surveillance Report

January 2015



Department of Health & Human Services



N E B R A S K A



**2013-2014 School Health Program Data Project:
Student BMI, Physical Examination & Vision Evaluation
Surveillance Report**

Nebraska Department of Health and Human Services

Joseph M. Acierno, MD, JD, Director, Division of Public Health, Chief Medical Officer

Judy Martin Deputy Director Community & Environment Health

Paula Eurek, Administrator, Lifespan Health

Kathy Karsting RN, MPH, Supervisor Maternal Child Adolescent Health

Carol Tucker BSN, RN, NCSN, School Health Program

Junmin Zhou, PhD Student & Graduate Assistant

December 2014

Acknowledgements

We would like to thank all of the school nurses and other school staff who collected and submitted data for the 2013-2014 Student BMI Surveillance Project. This project would not have been possible without their time and commitment.

Table of Contents

Executive Summary.....

Introduction..... 1

Methods..... 2

Results..... 3

Conclusions.....11

References.....12

Executive Summary of BMI Data Collection

Introduction: Nebraska is now the 22nd most obese state in the nation. Nebraska's adult obesity rate is 28.6 percent, up from 23.9 percent in 2003 and from 11.3 percent in 1990. Nebraska childhood obesity rates range from 14.3% for 2-4 year olds to 13.8% for 10-17 year olds. - Robert Wood Johnson Foundation (<http://www.fasinfat.org/states/ne/>). Obese youth are more likely than youth at healthy weight to become overweight or obese adults, and therefore are more at risk for associated adult health problems. Due to the negative consequences of obesity, preventing its onset in childhood is an important public health goal.

Purpose: The purpose of the 2013-2014 Data Surveillance Report was to provide schools the opportunity to submit their student height and weight data and student compliance with required physical examinations and vision evaluations to DHHS staff with Epidemiologic support from the UNMC College of Public Health who would subsequently compile, analyze, and report the data. Resulting state-level prevalence estimates could then be used by schools & public health practitioners in their prevention planning and evaluation efforts.

Methods: In March 2014, notification letters were mailed to school administrators in all schools. Due to several methodological limitations, the data presented in this report are not weighted. Results are thus not generalizable to all Nebraska students, but only represent characteristics of students from schools that submitted data. Data was also collected on levels of compliance with the statutory requirement for evidence of a physical examination for Kindergarten and 7th grade students and for vision evaluation for Kindergarten students.

Results: Data was collected from a total of 21,784 students for the project during the 2013-2014 academic school year. The proportions of overweight and obese students respectively both declined (16.3% and 18.0%), comparing to 17.1% and 18.7% in the 2010-2011 academic school year. Differences in prevalence of overweight and/or obesity were observed by sex, grade level, and race/ethnicity. 96.9% of Kindergarten and 96 % of 7th grade students were reported to have submitted physical exams. 91.4 % of Kindergarten student were reported to have submitted vision evaluations.

Conclusions: The rates of children in both the overweight and obese categories declined from the 2010-2011 BMI data report. More students were in the overweight and obese categories in grades 7 & 10 compared to students in the grade 1. There were greater numbers of male students in the overweight and obese categories than females. Future efforts to compile, analyze, and report student BMI data in Nebraska continue to be warranted.

Introduction

The prevalence of overweight and obese children is at an all-time high for our nation. Obese adults are at increased risk for many health conditions, including hypertension, type 2 diabetes, coronary heart disease, stroke, certain cancers, obstructive sleep apnea and osteoarthritis. Obesity affects every body system in a negative manner.

The chances of a child who is overweight or obese continuing to maintain that status increases as the child ages. Overweight and obese children are more at risk for associated adult health problems compared to non-overweight or obese children. Some conditions that have in the past mostly affected adults, are now being seen in children. Due to the negative health—and ultimately, economic—consequences of obesity, preventing its onset in childhood is an important public health goal.

Surveillance of body mass index (BMI) is an important step in planning and evaluating childhood obesity prevention and control efforts. BMI is an important piece of the puzzle that makes up a person's health status. In Nebraska, current BMI screening efforts rely on voluntary reporting of BMI screening results by schools. Ideally, obesity prevalence estimates should be based on accurate height and weight measures. Surveys that are based on parent-reported child height and weight are less reliable for accuracy.

In Nebraska, height and weight measures are a standard component of routine school health screenings and will be mandatory starting in the 2014-2015 school year. The

DHHS School Health Program estimates that at least three-quarters of Nebraska schools have been collecting such information on an annual basis for some or most students. The mandate for school health screenings also includes minimum qualifications for screeners to help improve accuracy and consistency in the screening process.

In 2004, the Overweight Among Nebraska Youth project was the first attempt to coordinate such data statewide. During the 2002-2003 academic school year, data were collected on 40,154 students in grades K-12 from 234 Nebraska schools. For the first time ever, this project provided accurate and generalizable estimates of childhood obesity in Nebraska. Unfortunately, due to staffing and funding limitations, the project was not repeated. The 2010-2011 Youth BMI Surveillance Project was also limited by lack of reporting data by all school districts across the state.

The purpose of the 2013-2014 Student BMI Surveillance Project was to again provide schools the opportunity to submit their student height and weight data to DHHS staff along with Epidemiology support from the UNMC College of Public Health who would subsequently compile, analyze, and report the data. The resulting state-level prevalence estimates could then be used by schools and public health practitioners in their prevention planning and evaluation efforts. The following report summarizes the methods and results from this project.

Method

In March 2014, notification letters were e-mailed to school administrators serving all public and non-public schools with at least one student in grades 1, 4, 7 or 10. In addition, an email was distributed on the school nurse listserv by the DHHS School Health Program Manager.

The letters described the purpose of the project and provided directions for accessing the project website where school personnel could download or view instructions for completing a data collection form; download the data collection form. The completed data form could then be submitted by email to a designated library in the DHHS SharePoint system and is not accessible to the public and is password protected.

The data collection form used for this project was a modified version of the Centers for Disease Control and Prevention (CDC) Children's BMI Tool for Schools. The Excel spreadsheet was modified for this project to include nine additional data fields: student race, student ethnicity, school name, school city/county, contact name, and contact phone number, collection of data for compliance with

required physical examinations for students entering Kindergarten or the beginner grade and students entering 7th grade, and data for vision evaluation for students entering Kindergarten. The CDC Children's BMI Tool for Schools is an Excel spreadsheet intended for use by school and other professionals who want to compute Body Mass Index (BMI)-for-age for a group of up to 2,000 students. The spreadsheet computes BMI and BMI percentiles for individual students in a school using height and weight measurements, sex, date of birth, and date of measurement information that are entered. It provides a school summary of students' BMI-for-age categories and graphs for prevalence of overweight and obesity, and prevalence of overweight and obesity by sex. The BMI tool does not require any identifying information on the individual child. Data are reported only in aggregate format.

Weight status categories for calculated BMI for-age percentile ranges are outlined in Table 1. These categories are from the CDC and are based on national expert committee recommendations*.

*Table 1. CDC weight status categories for children and teens **

http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html#interpreted%20the%20same%20way

Weight status category	<i>Percentile range</i>
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

In April 2014, an email reminder was sent to all schools that had either not already submitted data by that time, or had not been identified as a school that had closed, refused to participate, or was otherwise unable to provide the requested data. A total of 25,313 students for whom data was submitted for the project compared to data from 25,303 students in the 2010-2011 report. The number of students for whom data were obtained represent 25% of

students enrolled in the grades of interest statewide.

Due to several methodological limitations, the data presented in this report are again not weighted. Results are thus not generalizable to all Nebraska students, but only represent characteristics of students from schools that submitted data. However, results reflect data from geographically diverse schools.

Results of BMI data collection

Characteristics of respondents:

Information for a total of 21,784 students was collected statewide, with 217 incomplete records (total of 21,567 complete records). As indicated in Table 1, few students (121) were from the Kindergarten (only 0.6%), comparing to other grades (24.8% for 1st grade, 27.5% for 4th grade, 25.6% for 7th grade and 21.5% for 10th grade, respectively). There were more male students (51.3%) than female students (48.7%). In terms of race / ethnicity, White (Non-Hispanic) students dominate our survey sample (61.3%). Hispanic students account for 17.3% of total sample. It is

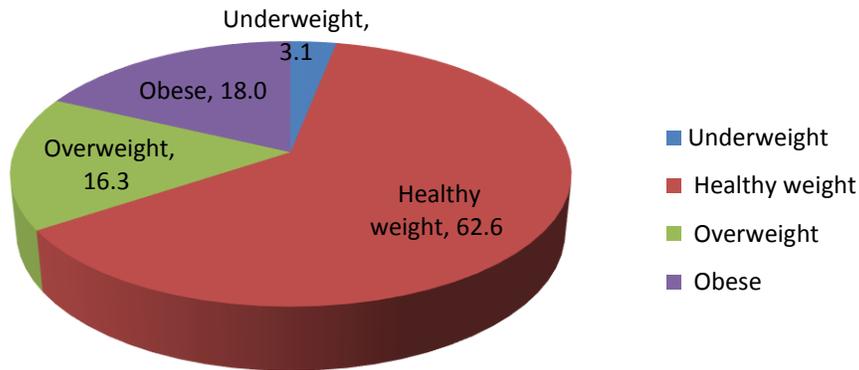
worth mentioning that races / ethnicities of a number of students were still unknown (9.7%, or 2090 students).

Overall prevalence:

In 2013-2014, the proportions of overweight and obese students declined (16.3% and 18.0%), comparing to 17.1% and 18.7% respectively in the 2010-2011 academic school year.

Figure 1 shows the percentage of distribution of students in the 2013-2014 sample across all weight categories.

Figure 1. Weight status among respondents

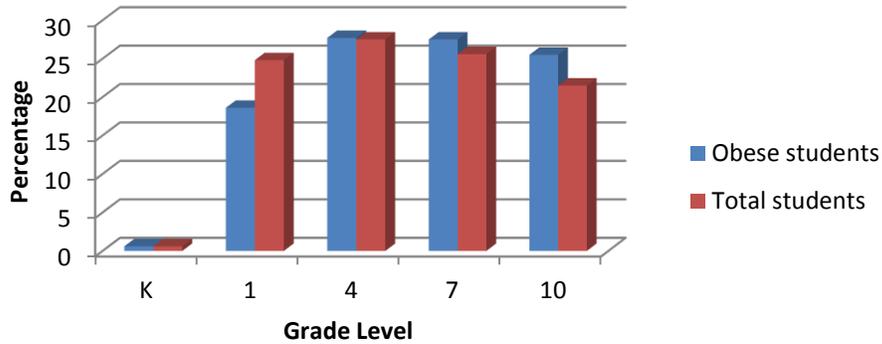


Prevalence of Obesity:

As indicated in Table 2, a total of 3,883 students were obese at the time of survey. To understand the prevalence of obesity among each explanatory variable, Chi-square tests were performed. For example, in Grade Level, the difference of obesity among each grade level is significant ($\chi^2=114.3$, $p<0.001$). Similarly, differences in gender and races are also statistically significant ($p<0.001$ as well).

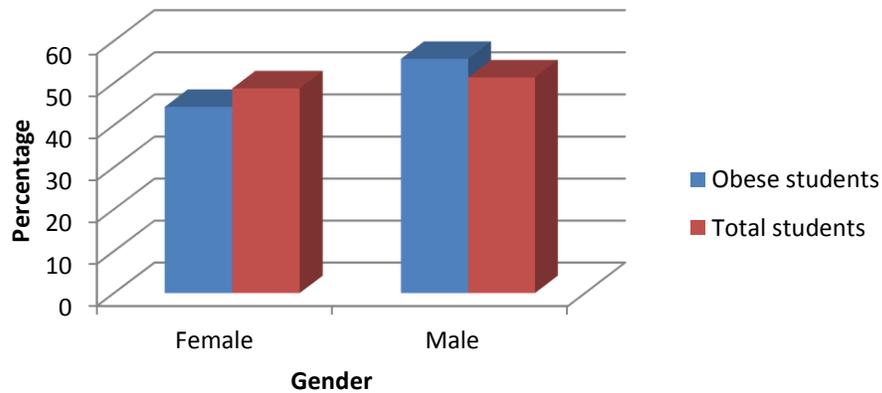
To understand the prevalence of obesity among each explanatory variable, Chi-square tests were performed. For example, in Grade Level, the difference of obesity among each grade level is significant ($\chi^2=114.3$, $p<0.001$). Similarly, differences in gender and races are also statistically significant ($p<0.001$ as well). As shown in Figure 2, as the grade level increases, students were more likely to be obese (If the proportions of grade levels in total students is used as average, obese students were below average in grade 1, and were above average in grade 7 and 10).

Figure 2. Comparison of distribution of obese students by grade to total distribution of students by grade.

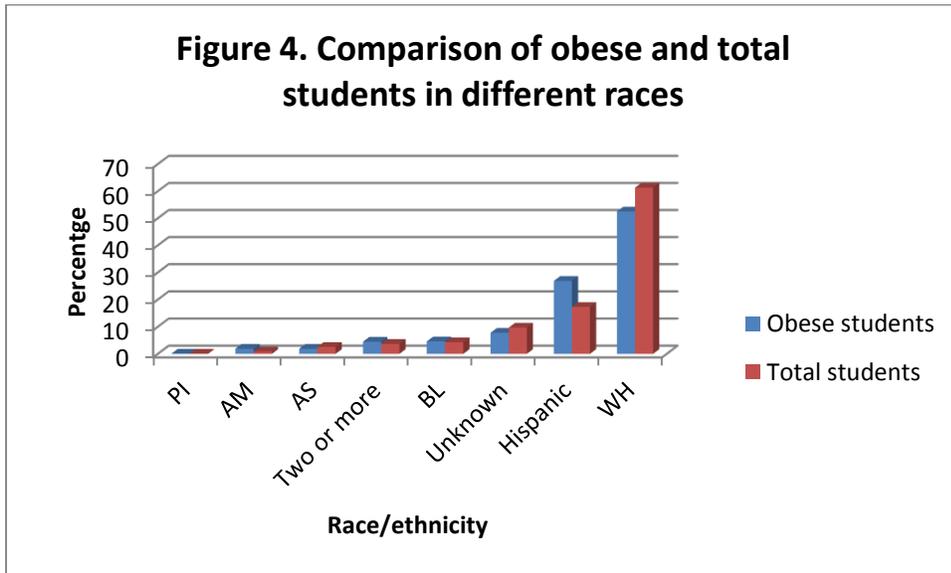


Similarly, based on information from Figure 3, male students were more likely than females to be obese.

Figure 3. Comparison of obese students by gender to total students by gender



In Figure 4, students who are Native American (AM), have two or more origins (Two or more), or who are Hispanic, are more likely to be obese than are Asian (AS) and White (WH) students.

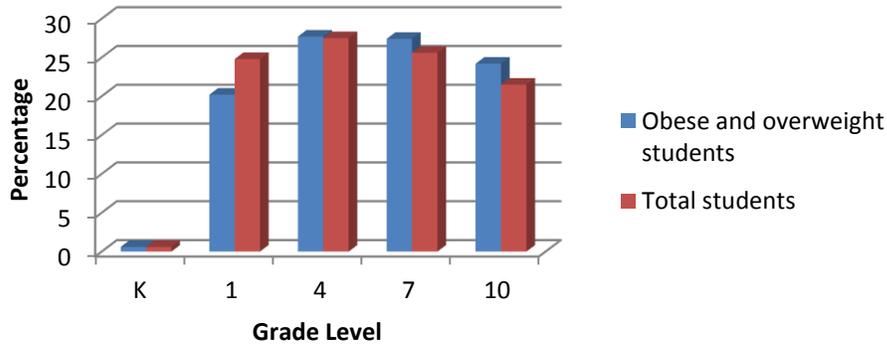


Prevalence of obesity and overweight:

As indicated in Table 3, total 7399 students were reported as obese or overweight at the time of survey. To understand the prevalence of obesity and overweight among each explanatory variable, Chi-square tests were performed. For example, in Grade Level, the difference of obesity among each grade level is significant ($\chi^2=149.9$, $p<0.001$). Similarly, differences in gender and races are also statistically significant ($p<0.01$ and $p<0.001$ respectively).

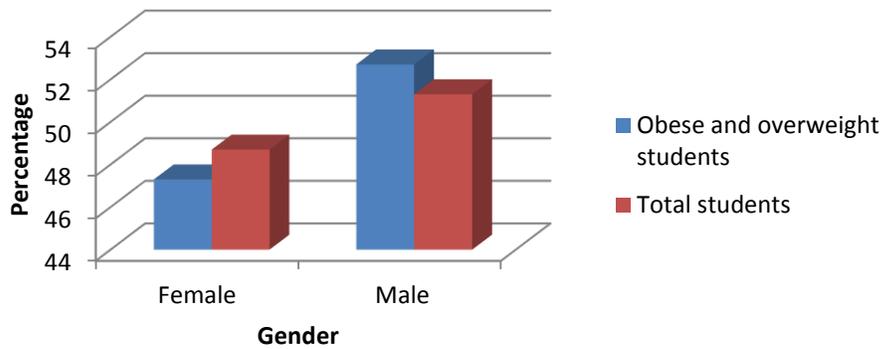
To further explore the relationship between explanatory variables and obesity and overweight, comparison of obese and overweight students to total students were made. As shown in Figure 5, as the grade level increases, students were more likely to be overweight or obese. Obese and overweight students were lower than proportionate representation by grade in grade 1; and higher than proportionate representation by grade in grades 7 and 10.

Figure 5. Comparison of distribution of obese and overweight students by grade to total distribution of students by grade.



Similarly, based on information from Figure 6, male students were more likely than females to be overweight or obese.

Figure 6. Comparison of distribution of obese and overweight students by gender to total distribution of students by gender.



In Figure 7, students who are Native American, have two or more origins, or are Hispanic were more likely to be overweight or obese compared to students who are Asian and White.

Figure 7. Comparison of distribution of obese and overweight students by race to total distribution of students by race

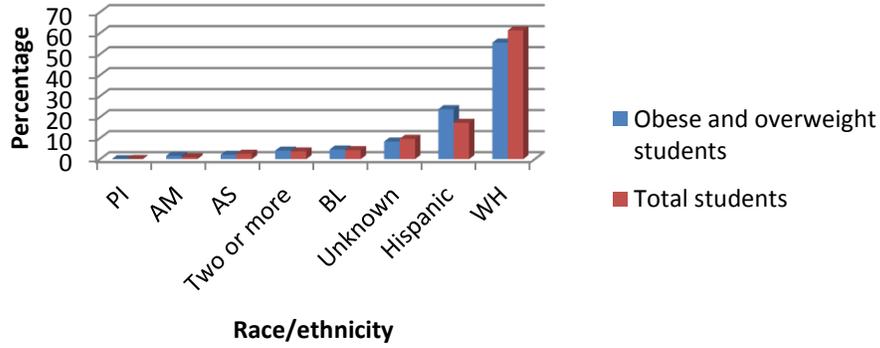


Table 1 Characteristics of participants

Explanatory Variables	Number	Percentage
Grade level		
K	121	0.6
1	5348	24.8
4	5937	27.5
7	5522	25.6
10	4639	21.5
Gender		
Female	10513	48.7
Male	11054	51.3
Race		
PI	11	0.1
AM	204	0.9
AS	570	2.6
Two or more	792	3.7
BL	938	4.3
Unknown	2090	9.7
Hispanic	3741	17.3
WH	13221	61.3

Note: 1. Total sample is 21567.

2. AM: Native; AS: Asian; BL: Black; PI: Pacific Islander; WH: White; Two or more: has two or more origins

Table 2 Prevalence of obesity among Nebraska students, 2013-2014

Explanatory Variables	Number	Percentage	Chi-square
Grade level			$\chi^2=114.3^{***}$
K	25	0.6	
1	724	18.6	
4	1076	27.7	
7	1069	27.5	
10	989	25.5	
Gender			$\chi^2=38.0^{***}$
Female	1719	44.3	
Male	2164	55.7	
Race			$\chi^2=385.6^{***}$
PI	2	0.1	
AM	72	1.9	
AS	74	1.9	
Two or more	175	4.5	
BL	177	4.6	
Unknown	302	7.8	
Hispanic	1043	26.9	
WH	2038	52.5	

Note: 1. Total sample is 3883.

2. ***: $p < 0.001$

3. AM: Native; AS: Asian; BL: Black; PI: Pacific Islander; WH: White; Two or more: has two or more origins

Table 3 Prevalence of obesity and overweight among Nebraska students, 2013-2014

Explanatory Variables	Number	Percentage	Chi-square
Grade level			$\chi^2=149.9^{***}$
K	45	0.6	
1	1492	20.2	
4	2046	27.7	
7	2024	27.4	
10	1792	24.2	
Gender			$\chi^2=9.6^{**}$
Female	3499	47.3	
Male	3900	52.7	
Race			$\chi^2=422.8^{***}$
PI	3	0.0	
AM	118	1.6	
AS	153	2.1	
Two or more	303	4.1	
BL	337	4.6	
Unknown	619	8.4	
Hispanic	1760	23.8	
WH	4106	55.5	

Note: 1. Total sample is 7399.

2. ***: $p < 0.001$; **: $p < 0.01$

3. AM: Native; AS: Asian; BL: Black; PI: Pacific Islander; WH: White; Two or more: has two or more origins

Results of Compliance with Required Physical Examinations and Vision Evaluations:

54 schools (5.3%) have reported information on kindergarten physical exams and vision exams as well as 7th grade physical exams. No previous data reports on levels of compliance by Nebraska schools in this area exist.

For kindergarten physical exams, data on total 2426 students were collected. Among them, 96.9% reported that they had physical exams, and 0.9% did not have such exams, while 2.1% waived the exams.

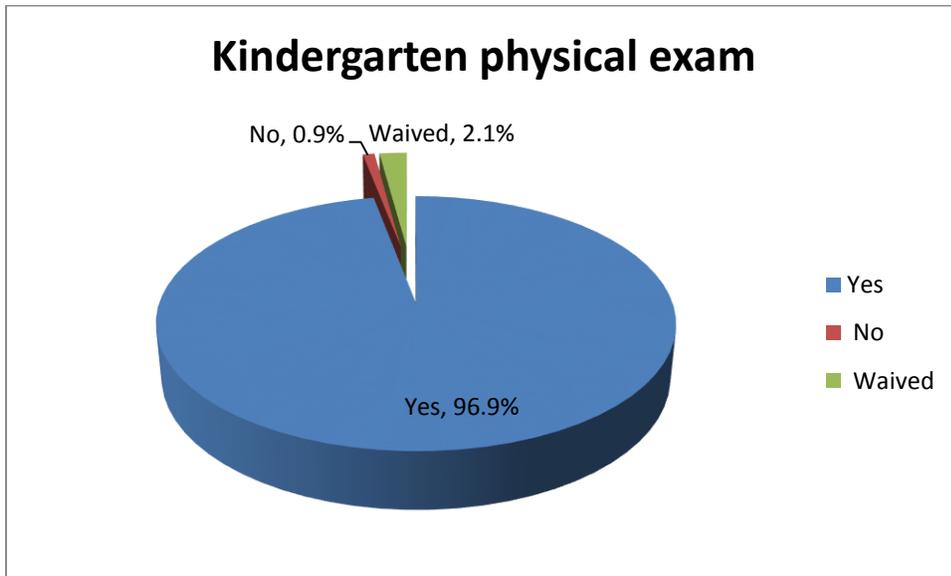
Kindergarten physical exams:

Yes: 2352 (96.9%)

No: 23 (0.9%)

Waived: 51 (2.1%)

Total: 2426



Information on physical exams among 2,110 7th grade students was identified. 96.0% had physical exams, and 2.2% did not, while 1.8% waived such exams.

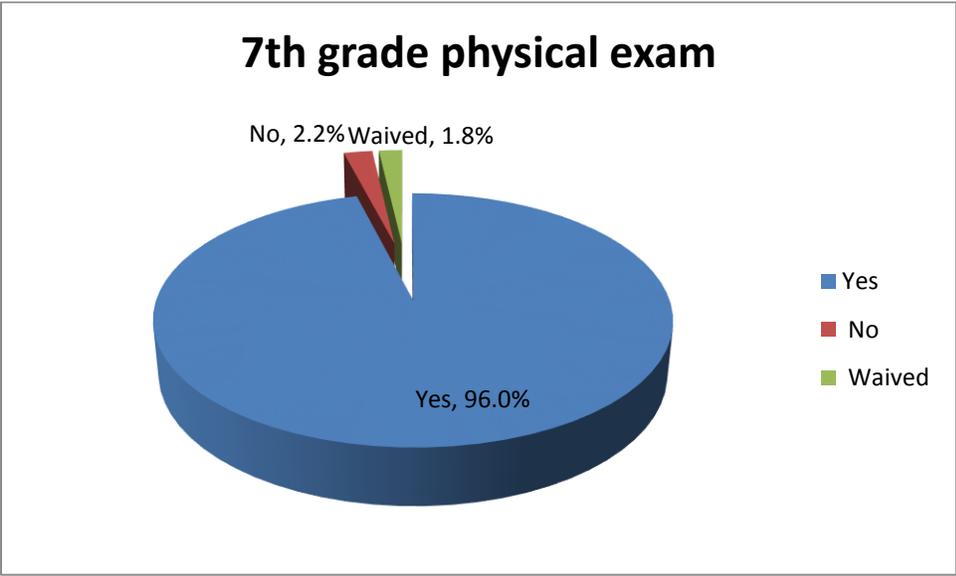
7th grade physical exams:

Yes: 2025 (8.1% of total enrolled in 7th grade)

No: 47 (2.2%)

Waived: 38 (1.8%)

Total: 2110



Among 2405 kindergarten students, 91.4% of them experienced vision exams, while 5.1% did not have and 3.5% waived.

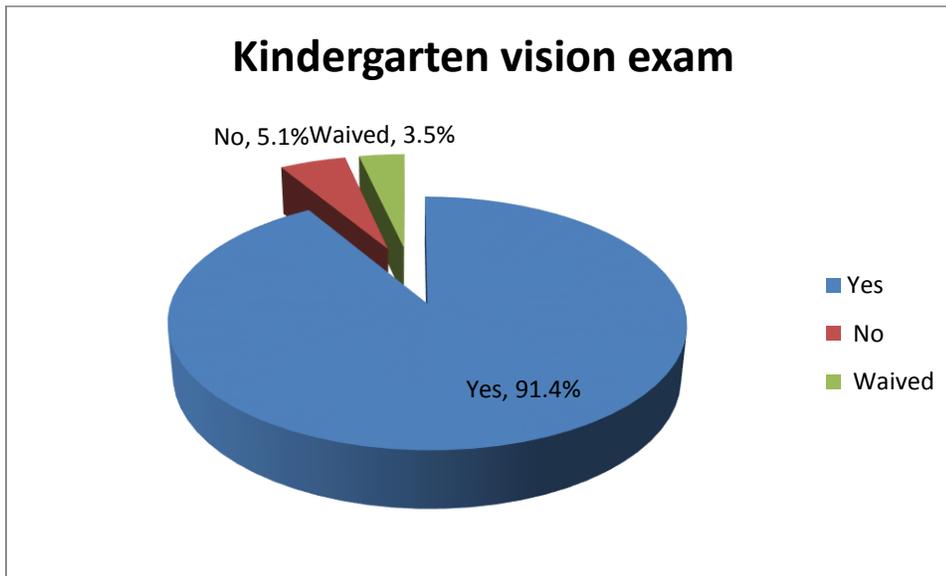
Kindergarten vision exams:

Yes: 2198 (91.4%)

No: 123 (5.1%)

Waived: 84 (3.5%)

Total: 2405 (9.7% of total enrolled in Kindergarten statewide)



Conclusions

Discussion of BMI data

This data project provides an estimation of the prevalence of children in Nebraska public schools who are in the overweight and obese categories as indicated by school health screening results. The reported results came mainly from students in grades 1, 4, 7, & 10. Of the BMI results reported there were 51.3% male students and 48.7% female students. Although 63.1% of reports were on White (Non-Hispanic) students, Hispanic students account for 17.3% of total enrollments. It is worth mentioning that

racess / ethnicities of a number of students were still unknown (9.7%, that is 2090 students).

The sample size represents students from 5.3% of Nebraska public schools and 22% of total enrollment in target grades.

Interventions in the school setting to alleviate childhood obesity should be on the side of prevention rather than treatment. This requires knowledge and skill development for students and families in the areas of healthy nutritional and physical activity choices as well as providing healthy

meals, snacks and opportunities for physical activity during the school day.

State level surveillance is needed to monitor trends and investigate risk factors.

Monitoring BMI status among public school students on a regular basis allows all stakeholders to better understand the implications of unhealthy BMI status and track progress using accurate data from schools.

As the School Health Screening Rules & Regulations are implemented starting in the 2014-2015 school year, more accurate and consistent data will be available. BMI data as well as minimum qualifications for screeners is mandated by TITLE 173 CONTROL OF COMMUNICABLE DISEASE CHAPTER 7 SCHOOL HEALTH SCREENING, PHYSICAL EXAMINATION, AND VISUAL EVALUATION*. There is also an Exception clause that allows the parent/guardian to take the child to the private medical provider to have the screenings done and a statement returned to the school verifying the mandated screenings have been done.

Discussion of Compliance with Required Physical Examinations and Vision Evaluations

Among the sample reporting, 96% of required entry physicals for Kindergarten and 7th Grade were complete with 1.8 – 2.1% of these physicals being waived by a parent/guardian. Only 0.9 of Kindergarten and 2.2 of 7th Grade students were not in compliance with the physical exam requirement.

*

<http://dhhs.ne.gov/publichealth/MCAH/Documents/173NACChapter-07final.pdf>

Kindergarten vision exam compliance was 94.9%. 100% compliance is desirable, and more efforts are needed for vision evaluation for Kindergarten students. Vision evaluation can be done by an Optometrist or by MD, OD, PA or APRN when the child receives a Kindergarten physical exam. A parent/guardian can legally waive the requirement for Kindergarten vision evaluation, but information on waived vision evaluations was not collected in this project.

Limitations of the Data Project

Data reporting is voluntary. The sample is non-representative and cannot be generalized to the whole state. This data collection does not contain data on the socioeconomic status or geographic location of students and so does not reflect the effects of poverty or geographical tendencies for obesity such as rural versus urban localities.

Implications for School Nursing Practice

School nurses and other school staff are encouraged to calculate and monitor their students' BMI. The data in aggregate can be used in discussions with community leaders, policy makers, and school board members about the importance of preventing overweight and obesity conditions among youth in their community, and the significance and impact of healthy food and activity environments at school. With quality data, schools are also more likely to obtain funding to support policy and environmental interventions designed to improve nutrition and physical activity levels among students.

School nurses can take action to raise awareness about environments that prevent children from being active such as lack of opportunity for physical activity in the neighborhood. School nurses can raise

awareness about barriers to healthy food including lack of income or knowledge of how to get assistance, lack of transportation,

lack of adequate storage facilities in the home such as a refrigerator or containers that will keep pests out of the family's food supply or the means to prepare the food such as a stove, oven or microwave oven or even access to electricity or other sources of power or running water.

School nurses have knowledge of the impact of unhealthy BMI's and the expertise to encourage prevention of BMI outside the healthy range.

Both the rates of children in the overweight and obese categories declined from the 2010-2011 BMI data report. Male students are more likely to be in the overweight and obese categories than female students.

References

- Bryan, Charity, PhD, Broussard, Lisa, DNS, RN, CNE, Bellar, David, PhD; *Effective Partnerships How School Nurses and Physical Education Teachers Can Combat Childhood Obesity*; January 2013 NASN School Nurse
- Justus MB1, Ryan KW, Rockenbach J, Katterapalli C, Card-Higginson P.; *Lessons learned while implementing a legislated school policy: body mass index assessments among Arkansas's public school students*. J Sch Health. 2007 Dec;77(10):706-13.
- Kim, Hee Soon PhD, RN, FAAN, Ham, Ok Kyung PhD, RN, MCHES, Jang, Mi Na MSN, RN, Yun, Hyun Jung MSN, RN, Park, Jiyoung MSN, RN (2014) *Economic Differences in Risk Factors for Obesity Among Overweight and Obese Children*; The Journal of School Nursing Vol. 30, #4, August 2014 pages 281-291.
- Welch, Erica PhD; 2010-2011 Youth BMI Surveillance Project Report

Although there are fewer Nebraska students in the overweight and obese categories compared to the 2010-2011, there are still health implications for those students who are in the overweight and obese categories. School nurses can be a positive influence in schools and communities to help continue the decline in the number of Nebraska students who are in the overweight and obese categories.

School nurses can be more proactive in communicating with a parent/guardian of an incoming Kindergarten or 7th Grade student by informing of the options for getting physical exams and vision evaluations.