

# Targeted Education for School Staff on Electronic Nicotine Delivery Systems: A Nurse Led Intervention

Lindsey Boehm, BSN candidate and Dr. Lorraine Smith, DNP, RN | College of Nursing and Health Sciences, University of Wisconsin- Eau Claire



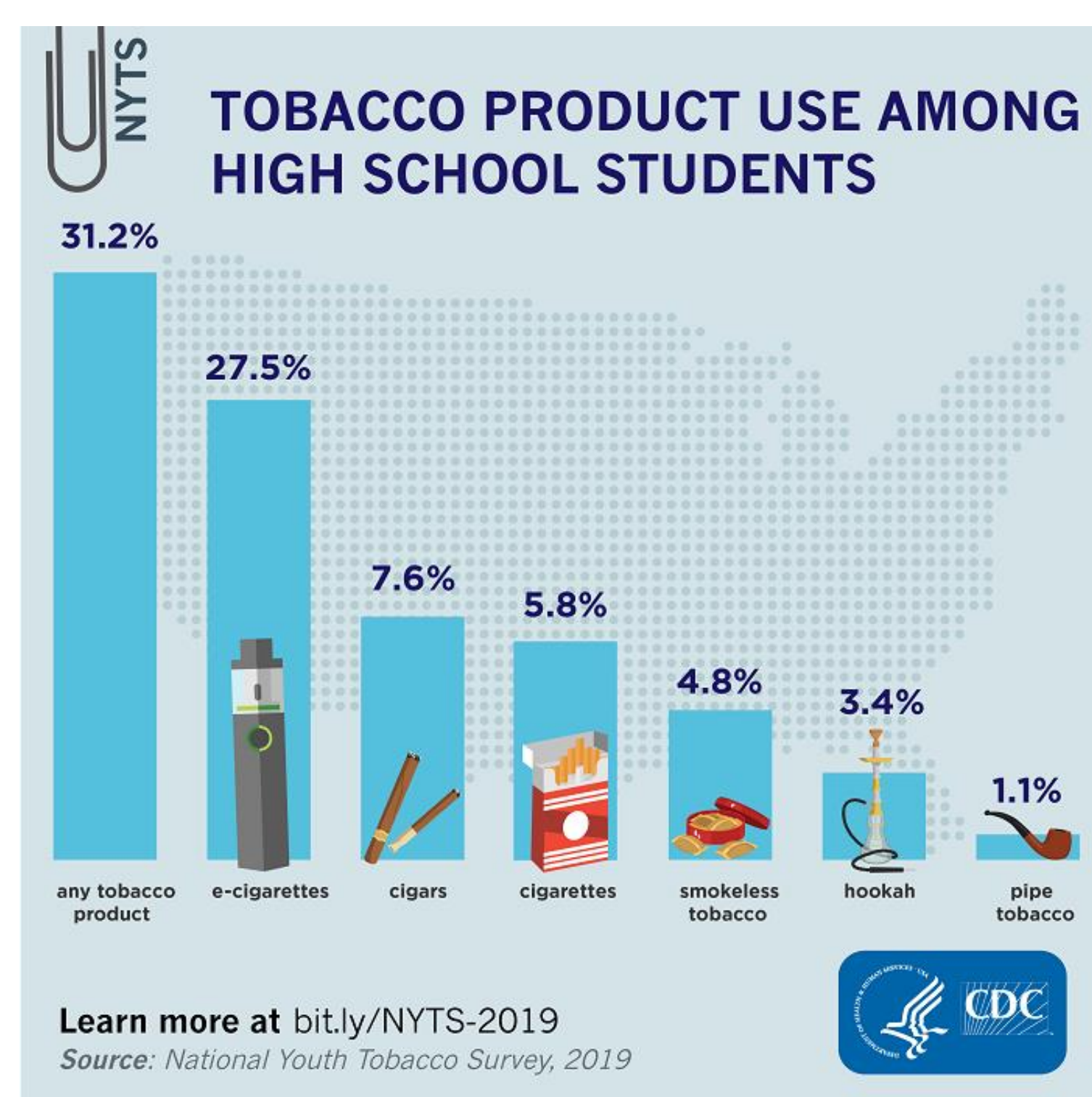
## ABSTRACT

There is a public health epidemic in adolescents' use of Electronic Nicotine Delivery Systems (ENDS), also known as electronic cigarettes, vaping products, or JUULs. However, little is known about the level of knowledge school staff have about ENDS. The purpose of this study is to identify knowledge strengths and deficits held by school staff about ENDS and examine the effectiveness of this nurse-led intervention. A descriptive, non-randomly selected pre-test/post-test design was used with 125 Wisconsin school staff. Results revealed further educational needs of school staff in areas of advertising trickery that entices youth, including the multiple flavors of ENDS products. Following the educational intervention, post-test results showed a significant overall improvement in participant knowledge scores. Recommendations include implementing nurse-led education about ENDS to a more diverse population of school staff. Providing nurse-led ENDS education to school staff offers an upstream, proactive approach to address this public health epidemic.

## INTRODUCTION

### BACKGROUND

- ENDS include electronic cigarettes (e-cigarettes) and vaping products, such as JUUL, blu, and Phix.
- Between 2011 and 2015, use of ENDS among middle and high school students increased by over 900% (Centers for Disease Control and Prevention [CDC], 2020).
- By 2020, 19.6% of high school students (3.02 million) and 4.6% of middle school students (550,000) reported current e-cigarette use (Cullen et al., 2020)
- In Wisconsin, where this study was conducted, 45.4% of high schoolers reported having tried vaping and 20.6% reported use of ENDS in the past 30 days (Wisconsin Department of Public Instruction, 2019).



Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion  
[https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/youth\\_data/tobacco\\_use/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm)

## RESEARCH QUESTIONS

1. What knowledge deficits do school staff have about ENDS?
2. What knowledge strengths do school staff have about ENDS?
3. How did the pre-test scores compare to the post-test scores?

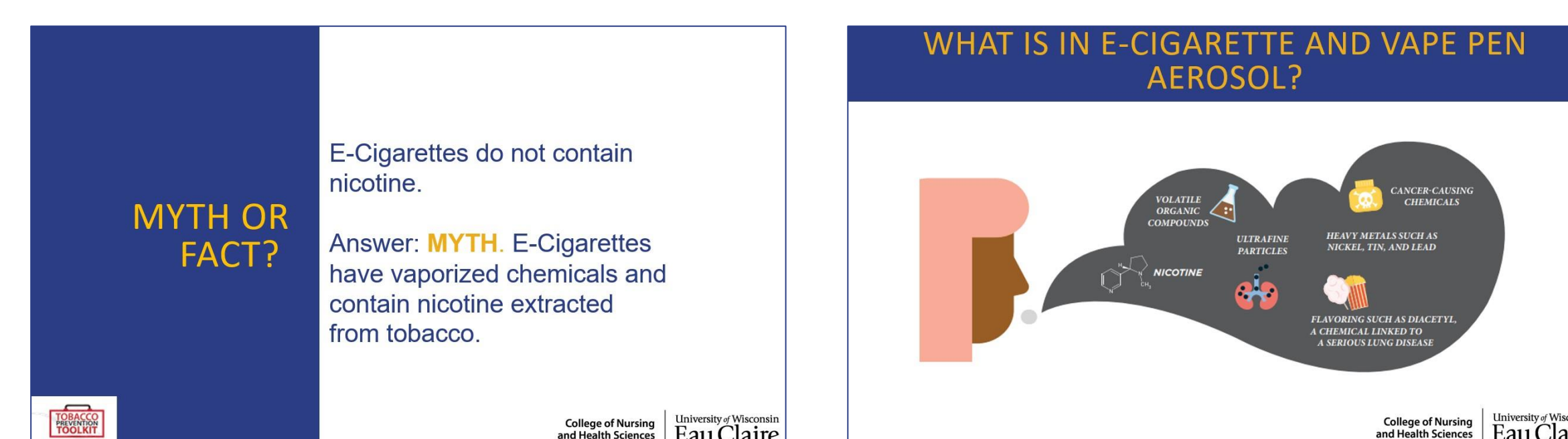
## MATERIALS AND METHODS

### PRESENTATION AND ENDS KNOWLEDGE ASSESSMENT INSTRUMENT

The evidence-based presentation used information and official statistics from the CDC, FDA, Stanford Medicine, and journals. With permission from Stanford Medicine, the educational resources in their Tobacco Prevention Toolkit (2020) were adapted for the presentation. The Stanford Tobacco Prevention Toolkit is a research-based, evidence informed educational resource that is free for the public. The pre- and post-test instruments were designed using 20 multiple choice and true/false questions obtained from the Stanford Tobacco Prevention Toolkit.

### PROCEDURE

The purpose and procedures of the study were given verbally and in writing to all attendees. Participants signed the consent form, completed the pre-test, and submitted them prior to the beginning of the presentation. The 45-minute presentation was delivered to all attendees, with time for questions and discussion. Presentation topics included relevant statistics, basic vaping devices, health effects, advertising, and recommendations for talking with students about vaping. After the presentation, participants completed the post-intervention assessment and submitted it to the nurse researchers.



Examples of slides presented

## RESULTS

### QUESTION 1: WHAT KNOWLEDGE DEFICITS DO SCHOOL STAFF HAVE ABOUT ENDS?

#### At Pre-Test:

- 9.4% of participants could correctly identify the number of ENDS flavors
- 17.2% correctly identified 18- to 25-year-olds as the target audience of ENDS companies' advertisements
- 24.2% correctly responded that e-cigs are devices that produce nicotine and/or additives in the form of an aerosol (most respondents indicating vapor)
- 31.9% knew that one JUUL pod has at least 41.3 mg of nicotine per pod

### QUESTION 2: WHAT KNOWLEDGE STRENGTHS DO SCHOOL STAFF HAVE ABOUT ENDS?

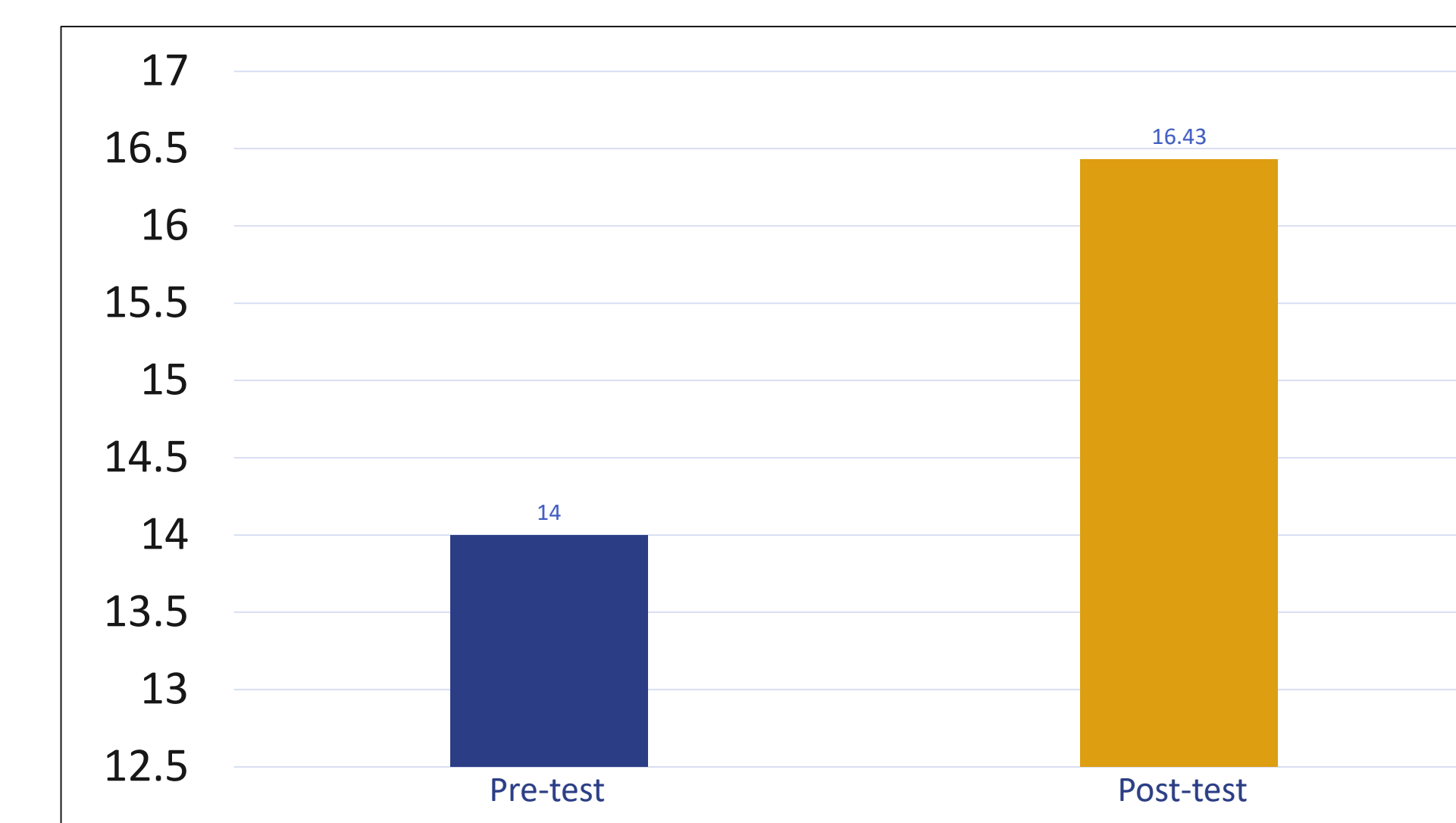
#### At Pre-Test:

- Most respondents knew that nicotine is an addictive stimulant that changes brain chemistry (97.7%)
- Respondents scored well on pre-test scores related to aerosols flavors
- Respondents knew that fruit-based e-cig/vape pen flavors can be harmful (96.9%)

### QUESTION 3: HOW DID THE PRE-TEST SCORES COMPARE TO THE POST-TEST SCORES

- As a group, the school staff demonstrated an average improvement of 2.43 points (out of 20) from pre- to post-test.
- A paired-t-test showed a significant difference between pre- and post-test scores,  $t(121) = 14.5$ ,  $p < .001$ .

### Comparison of Average Scores



## DISCUSSION

Our supposition that school staff would have increased knowledge of ENDS after participating in an interactive educational presentation was supported. The average increase in correct responses was 2.43 points (out of 20) from pre- test to post- test, a 12.2% increase. This finding is consistent with results from the Baer, et al. (2021) pilot study which found that middle and high school teachers' knowledge of ENDS increased following an educational workshop. Our findings, combined with the Baer et al. findings suggest that education can be a powerful tool for correcting misperceptions about ENDS.

School staff surveyed had strengths in their awareness of the prevalence of ENDS use among youth. This sample's mean estimate for the percentage of high-school students who use vapes or e-cigarettes was 37.01%. The actual percentage of high-school students who reported use of ENDS in 2020 was 19.6% (Cullen, et al., 2020). The participants' overestimation of the prevalence of ENDS use suggests that the school staff in this study were aware of the prevalence of vaping among high schoolers.

### Providing Education to Youth Directly

In addition to providing our educational intervention for over 100 school staff, we were also able to deliver education directly to youth with funding from the Gritzmacher Science Education Fellowship Award. We provided a virtual presentation about vaping and e-cigarettes to two after school clubs as well as a local juvenile detention center, reaching over 20 area youth. The sessions were free, and no data were collected on the youth.

### ACKNOWLEDGEMENTS

The authors pay special tribute to Dr. Diane Marcyjanik, who was an esteemed colleague, educator, and mentor. She initiated and led this project until she passed away unexpectedly and far too early in life. The authors also thank Dr. Rosemary Jadack for her consultations and expertise in data analysis and we thank Stanford Medicine colleagues for allowing us to adapt content in their Tobacco Prevention Toolkit for purposes of this research. Lastly, we thank the funders of the James R. Larson and Vicki Lord Larson Undergraduate Research Fellowship Award and of the Gritzmacher Science Education Fellowship Award for their financial support of this project.



Dr. Diane Marcyjanik

### REFERENCES

- Baer, C.M., Khoushine, M.A. & Dobbs, P.D. (2021). Tobacco prevention education for middle school and high school educators. *Health Education Journal*, 80(1), 16-27. <https://doi.org/10.1177/0017896920950344>
- Centers for Disease Control and Prevention. (2020). *Youth and tobacco use*. Retrieved from [https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/youth\\_data/tobacco\\_use/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm)
- Cullen, K.A., King, B.A., Neff, L.J., Park-Lee, E. & Wang, T.W. (2020). E-cigarette use among middle and high school students – United States, 2020. *Morbidity and Mortality Weekly Report*, 69(37), 1310-1312. <http://dx.doi.org/10.15585/mmwr.mm6937e1>
- McCoy, Katherine. 2019 Wisconsin Youth Risk Behavior Summary Report. Madison: Wisconsin Department of Public Instruction, 2020. [https://dpi.wisconsin.gov/sites/default/files/mccs/sswp/pdf/YRBS\\_2019\\_Summary\\_Report\\_DPI\\_Web\\_Version.pdf](https://dpi.wisconsin.gov/sites/default/files/mccs/sswp/pdf/YRBS_2019_Summary_Report_DPI_Web_Version.pdf)
- Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. (2020). Youth use of tobacco products in any form is unsafe. Retrieved from [https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/youth\\_data/tobacco\\_use/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm)