

An assessment of student pharmacists’ knowledge of electronic cigarettes or vapes – A cross sectional study at one college of pharmacy

Ibrahim Alfayoumi ¹, Osama Aqel ¹, David R. Axon ¹

¹ University of Arizona College of Pharmacy



Background

- The use of e-cigarettes/vapes has increased over the past decade and is a timely and significant public health issue.¹
- E-cigarettes/vapes are advertised as a smoking cessation aid, and being healthier, cheaper, and more socially acceptable than conventional cigarettes, yet they can also lead to lung injury.¹⁻²
- There is limited published research regarding how healthcare professionals perceive the current use, status, and effectiveness of e-cigarettes/vapes.

Objective

- To assess the knowledge of e-cigarettes/vapes among student pharmacists at one United States college of pharmacy.

Methods

- All third- and fourth-year student pharmacists currently enrolled at the University of Arizona College of Pharmacy were eligible to participate in this cross-sectional survey (third year N=136, fourth year N=130).
- Students were asked to answer 20 multiple-choice knowledge questions developed from the Tobacco Prevention Toolkit,³ and two demographic items (gender, year).
- Each multiple-choice knowledge question was scored correct or incorrect, with one point assigned for a correct answer and no points for an incorrect answer. Total scores for knowledge items could therefore range between zero and 20.
- Differences in the proportion of students who correctly answered each knowledge item were compared between year groups using a chi-square test, while differences between year groups for total knowledge score were compared using a two-sample t-test.

| Table 1. Student pharmacists’ knowledge of e-cigarettes | | | |
|---|------------------------------------|-------------------------------------|---------|
| Knowledge Questions | Third-year (N=30) N (%) correct | Fourth-year (N=20) N (%) correct | p value |
| 1. E-Cigarettes/vapes _ have nicotine [Sometimes] | 13 (43.3) | 11 (55) | 0.0980 |
| 2. Nicotine [All the above] | 24 (80) | 15 (75) | 0.3972 |
| 3. A drop in nicotine levels causes the body to have strong cravings for nicotine [True] | 27 (90) | 18 (90) | 1.000 |
| 4. Nicotine causes increased heart rate, lung damage, acid reflux, inhibits your sex drive and [More health problems for those with diabetes] | 24 (80) | 16 (80) | 1.000 |
| 5. E-cigarette/vape pen flavors are fruit based and therefore not harmful [True] | 21 (70) | 14 (70) | 1.000 |
| 6. E-Cigarettes/vapes cause aerosols to enter the lungs, may contain nicotine, and causes ear/eye/throat irritation [Yes] | 27 (90) | 15 (75) | 0.0052 |
| 7. We know there are no health risks associated with the use of e-cigarettes/vapes [False] | 22 (73) | 12 (60) | 0.0461 |
| 8. E-cigarettes are devices that deliver nicotine and/or additives in the form of an [Aerosol] | 11 (37) | 6 (30) | 0.3150 |
| 9. E-cigarettes are also referred to as [All the above] | 22 (73) | 12 (60) | 0.0461 |
| 10. How many flavors of e-cigarettes are currently being sold? [15,000+] | 11 (37) | 3 (15) | 0.0005 |
| 11. Which of the following chemicals have been found in e-cigarettes/vape pens? [All the above] | 19 (63) | 10 (50) | 0.0688 |
| 12. The amount of nicotine in an e-cigarette pod is nearly equivalent to: (pod is the piece that contains e-juice) [1.5 to 2 packs of cigarettes] | 17 (57) | 11 (55) | 0.8087 |
| 13. Which of the following statements about e-cigarette's liquids are TRUE? [Some contain nicotine] | 14 (46) | 9 (45) | 0.8094 |
| 14. An e-cigarette/vape product with a 5% strength of nicotine is [Very high in nicotine] | 6 (20) | 2 (20) | 1.000 |
| 15. Which organs in the human body does nicotine affect? [All the above] | 24 (80) | 15 (75) | 0.3972 |
| 16. Vaping labs reports 7 ingredients in their pod e-juice. Independent scientists found how many chemicals in their pod e-juice? [59] | 10 (33) | 8 (40) | 0.3255 |
| 17. What about pod-based system advertisements makes it problematic for young people? [All the above] | 24 (80) | 15 (75) | 0.3972 |
| 18. How are pod-based systems marketed to young people? [All the above] | 26 (87) | 15 (75) | 0.0355 |
| 19. Market e-juices range from 0-25 mg per ml of nicotine, while one pod has at least _ mg of nicotine per pod [41.3 mg/ml] | 6 (16.7) | 3 (15) | 0.7420 |
| 20. What do we NOT know about pod-based systems? [All the specific ingredients & long-term effects of using it] | 27 (90) | 14 (70) | 0.0004 |

Results

- Thirty third-year and 20 fourth-year students completed the survey (19.5% response rate).
- Most respondents were female (60%).
- There was no significant difference between third- and fourth-year students for mean total knowledge scores (third year = 12.5±3.3, fourth year = 11.2±3.1, p=0.1780).
- There was a significant difference between third- and fourth-year students for items 10 and 20.

Conclusion

- These findings suggest there is a need for further education on e-cigarettes/vapes so that student pharmacists are well prepared to counsel patients on their use when they enter clinical practice.

References

1. Adhikari R, Koritala T, Gotur R, Malayala SV, Jain NK. EVALI - E-cigarette or vaping product use-associated lung injury: a case report. *Cureus*. 2021;13(2):e13541.
2. Rom O, Pecorelli A. Are e-cigarettes a safe and good alternative to cigarette smoking? *Ann N N Acad Sci*. 2015;1340:65-74.
3. Stanford Medicine. Tobacco Prevention Toolkit. <https://med.stanford.edu/tobaccopreventiontoolkit> (accessed 28 January 2022).