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Improving Youth and Community Health Through Nicotine Pouch Education

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Problem Identification

Ever since nicotine pouches entered the US in 2016, their use has been steadily rising nationwide. Sales of nicotine pouches have increased more than six times between August 2019 and March 2022. This is in line with a broader trend of increasing use of smokeless products as they are more discrete and often flavored. For these reasons, they also pose unique challenges. According to a local guidance counselor, "I personally feel as though the production of these fun flavors purposefully targets teenagers and young adults."

A nationwide survey in 2024 showed 1.8% of middle and high school students reported currently using nicotine pouches. The 2016 community need assessment from Silver Hill Hospital in Fairfield County Connecticut showed "less than 40% of respondents felt that prevention, education and outreach regarding mental health and/or substance abuse occurs

frequently enough in the community." According to Catalyst CT, a local behavioral health organization, there has been rising use of smokeless tobacco in Southwestern Connecticut with Zyn being the most popular. In fact, ZYN is manufactured by Phillip Morris International, a Stamford-based company.

As these products become more popular, it is important that providers are informed about how these products compare with other forms of nicotine. It is also important that providers can identify motivations for use and can help promote safe use habits and harm reduction through motivational interviewing.

This project addresses two AHEC focus areas Behavioral Health Integration and Medical Practice Transformation.

Public Health Cost

The cost of rising nicotine use on public health cannot be overstated, particularly the cost on youth.

Among the four largest brands, over 800 million pouches were sold in the first three months of 2022. While quantitative local data is not available, local organizations such as Catalyst CT (which services Southwestern Connecticut) report seeing a qualitative rise in nicotine pouch use. As per one local librarian, “I feel like in the last couple years, I have seen a growing number of people coming in and using nicotine pouches while working.”

Nicotine pouches are most used by young adults aged 18–24 which is a vulnerable population. Firstly, nicotine harms brain development, which continues until about age 25.

During adolescence, nicotine also harms the parts of the brain that control attention, learning, mood, and impulse control. Nicotine is highly addictive, and the adolescent brain is prone to addiction.

One high school guidance counselor also relayed the unique challenges of withdrawing from nicotine for youth and how it can lead to the overprovision of healthcare; “as their parents were not aware of their nicotine use in the first place and therefore had no reason to believe that their child was experiencing nicotine withdrawal, they instead feared that their child was extremely sick for an unknown reason.”

Community Perspectives

Emerging Use

High School Guidance Counselor

"Teens who use nicotine experience intense physical and psychological symptoms (e.g., restlessness, feelings of anxiety, depressive symptoms, changes to their sleep and appetite)... There is a definite trend among students who use nicotine products being in my office for poor grades, academic dishonesty, and behavioral problems such as talking back, being aggressive with peers, and cutting class."

Current Nicotine Pouch User

"I feel like so many people my age use nicotine pouches. I see people in the library using them and know many of my friends also use them. Lots of people I know see it as a less harmful alternative to smoking that can be done more discretely. I am personally scared that there may be adverse effects on my mouth, lungs, and heart, but I honestly have no clue how their health effects compare to vaping or smoking."

Barriers

High School Guidance Counselor

"Nicotine use only harms children, and while keeping their nicotine use a secret from their parents is a developmentally predictable behavior for the age group, it only exacerbates the negative effects of the substance on their lives."

Current Nicotine Pouch User


"I first started using nicotine in high school when I used my friend's vape. Since then, I have explored various nicotine products, and I currently use Zyns [nicotine pouches] because of their ease of use and how discrete they are. I have tried to stop using them and I know it would be better for my health if I quit, but it is so convenient I frequently find myself going back to use."

Intervention and Methodology

Using the most up-to-date information that I can find regarding nicotine pouch use and health effects, I will create an informational handout on the health impacts of nicotine pouches and how they compare to other forms of nicotine use. I will also include local resources that support patients who use nicotine pouches for provider reference.

To reinforce important points, I will give them a brief, follow-up quiz on the most important takeaways from the handout.

NICOTINE POUCHES
By Alexander Vitale, Larner College of Medicine Class of 2027



What are Nicotine Pouches? What is in them?
Nicotine pouches are oral cellulose products that deliver nicotine absorbed through the gums. Nicotine pouches (like ZYN and VELO) contain nicotine that is chemically synthesized or extracted which distinguishes it from older tobacco pouches (like Snus and Skoal) which contain tobacco leaf. Thus, these products have less compounds in them. Yet, pouches still commonly contain hazardous materials such as formaldehyde, chromium, and nitrosamines [Formaldehyde is typically only detected at low levels and may not be a considerable health risk]. Typical range of strength is 3mg to 15mg. 4mg pouch has approximately the absorbed nicotine of 1 cigarette.

Benefits from cigarettes?
Nicotine pouches are considered a lower-risk alternative tobacco product that may reduce some health risks and exposure to toxic and cancer-causing chemicals found in cigarettes. Yet, nicotine in any form is still an addictive chemical.

Regulated?
Some of these products are authorized by FDA to meet the statutory public health standard, but no nicotine pouches are approved to help people quit smoking. Advocates point to role in harm reduction, but other FDA-approved nicotine replacement therapies are pharmaceutical-grade and have stricter quality standards. Due to lack of regulation, there is a wide variety of pharmacokinetics in the pouches with different pH and chemical profiles that change absorbability.

Caution for patients with children!
There has been a steady rise in pediatric hospitalizations secondary to accidental nicotine pouch exposure. Often marketed as tobacco-free to imply less health risk but risks still exist!

Vulnerable populations
Pregnancy: Nicotine is toxic to developing fetuses and is a health danger for pregnant women.
Young adults/youth: Nicotine can harm brain development, which continues until about age 25. Using nicotine during adolescence can harm the parts of the brain that control attention, learning, mood, and impulse control. Nicotine is highly addictive, and the adolescent brain is prone to addiction.

Rising use
Entered the U.S. market in 2016. Use is more common in males, younger adults, and people with history of smoking/vaping. Smokeless tobacco products on the rise, more popular because flavored and discrete. In 2024, 1.8% of middle and high school students reported currently using nicotine pouches. Sales of nicotine pouches increased 6x August 2019 to March 2022.

Long-term effects?
Many long-term effects of nicotine pouches on oral and cardiovascular health are unknown. However, studies show that they can deliver high nicotine doses that tax the cardiovascular system. High-dose 20-30mg nicotine pouches can raise heart rate and blood pressure as much as cigarettes. With lower doses showing more mild effects. Nicotine is vasoconstrictive and poses biggest risk to cardiovascular system as sustained exposure can strain on heart and blood vessels. Possibly increasing risk of hypertension, heart attack, heart disease, and stroke. Furthermore, carcinogens and chromium has been found in nicotine pouches, which can deteriorate gum tissue and increase risk for periodontal diseases.

Motivations for use?
Common reasons for use include an attempt to quit/reduce smoking or vaping, avoidance of odor, curiosity of flavor or "buzz".

Local Resources to Support Recovery
<https://icommittoquitct.com/>
CT Quitline: 1-800-QUIT-NOW
For adolescents with concurrent vape use: <https://vapefreect.org/> or text text VapeFreeCT to 88709

Brief Quiz

- How is nicotine delivered via nicotine pouches?
 - Directly through the gums
 - Ingested in the stomach
 - Inhaling fumes
- Are nicotine pouches an FDA-approved nicotine replacement therapies?
 - Yes
 - No
- What populations are most vulnerable to harmful effects of nicotine [SELECT ALL]?
 - Elderly
 - Youth
 - Patients who are pregnant
 - Men
- Approximately what percentage of middle and high schoolers report current nicotine pouch use?
 - 0.5
 - 2
 - 4
 - 10
- Which of the following is NOT a common reason for nicotine pouch use?
 - Attempt to quit/reduce smoking or vaping
 - Avoidance of smoke odor
 - Improve cardiovascular fitness
 - Curiosity of flavor or "buzz"

Results and Reflections

Providers are already seeing a growing number of patients, young and old, who use nicotine pouches. This intervention will help reinforce and update their knowledge of the latest science on health effects of this emerging trend. It equips them with the resources they need not only to refer patients externally, but to motivationally interview patients to make a change in habits to improve health. Hopefully, with this education, providers will feel empowered to discuss this topic with patients and promote stigma-free community health.

If I had more time to fine tune this intervention, I would want to follow up post-intervention after a doctor has talked with a patient who uses nicotine pouches and see whether they thought that information was helpful and how it could be improved. The biggest challenge that I faced was getting community partners to talk about this topic. Nicotine use, particularly among youth, is often something that is taboo and it was hard to get perspective of those who are serving them as they are too often under-resourced. Furthermore, the true scope of the problem may be obfuscated by youth underreporting which contrasts with what is being qualitatively seen by those who interact daily with adolescents. Specific local data was also hard to find as this is nascent, albeit rapidly-growing, market.

Future Directions

This project could be taken in many directions to build upon the intervention. Most simply, it could be expanded to other family medicine or behavioral health clinics in the region. Also, speaking directly to more current users and programs that support those struggling with nicotine use issues to get their perspective is crucial to understanding motivations and best ways that doctors can provide support. In this vein, the intervention itself may be adapted for use as a patient handout that could be given directly to patients. It would also be interesting to talk to local retailers of nicotine pouches and see what trends they are seeing.

From talking with the providers, they were very appreciative of the update, and this is a good model for other interventions that address emergent health topics that are being seen in clinic.

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