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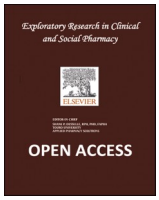

Parent perspectives on the design, implementation, and use of the parent *E*-cigarette and vaping educational resource (P-EVER)

Olufunmilola Abraham [a,*], Zachary Paulsen [b], Evan Slonac [b], Jenny Li [b]

[a] University of Kentucky College of Pharmacy, Department of Pharmacy Practice & Science, 789 S. Limestone Street, TODD 292K, Lexington, KY 40536, USA
[b] University of Wisconsin-Madison, School of Pharmacy, Social & Administrative Sciences Division, 777 Highland Ave, Madison, WI 53705, USA

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ABSTRACT

Background: Adolescent use of e-cigarettes has been recognized as a significant public health concern as rates of adolescent vaping increase. As evidence of respiratory damage and other health concerns continue to emerge, educational resources for parents are critical in combating the vaping epidemic. A vaping educational tool can serve as a resource that parents of adolescents can reference to learn about e-cigarette use and how to address this topic with their families.

Objective: The purpose of this study was to examine parents' perspectives on the design and use of an educational infographic (Parent *E*-Cigarette and Vaping Educational Resource; P-EVER) to inform parents of adolescents and their families about e-cigarette use, risks, and quitting resources.

Methods: Parents who had an adolescent aged 12 to 18 years were recruited through community pharmacies in Wisconsin through recruitment fliers, emails, and word of mouth between February and June 2023. Participants reviewed the vaping educational handout in a semi-structured interview that was recorded and transcribed verbatim. Two members of the research team independently coded each transcript using NVivo software to conduct inductive thematic analysis. Bi-weekly meetings were held to refine codes, develop the master codebook, and identify prevalent themes (intercoder reliability - 0.83).

Results: Thirty-five parents were interviewed between February and June 2023. Four themes were identified: vaping awareness, P-EVER content and implementation, pharmacist's role, and barriers to pharmacist intervention on vaping. Participants believed the vaping educational handout was an effective resource for disseminating information to parents of adolescents. Responses highlighted the importance of providing educational resources to initiate conversations surrounding health risks to adolescents.

Conclusion: Pharmacists played a crucial role in successfully disseminating the P-EVER education tool to parents of adolescents. Future work is required to determine effective interventions for pharmacists and adolescents to discuss the topic of vaping awareness and safety.

1. Background

Originally intended as a smoking cessation tool, electronic cigarettes (e-cigarettes) and vaping have undergone exponential growth since their introduction to the United States in 2007.[1] The number of e-cigarette products available in the United States increased from 453 in June 2021 to 2023 in June 2022.[2–4] These devices typically have a power source that heats an "e-liquid" into a vapor for inhalation.[4–6] *E*-cigarettes often have the appearance of common household objects such as a pen, flash drive, or traditional tobacco products.[4–6] The e-liquid can contain an array of dangerous ingredients such as nicotine, tetrahydrocannabinol (THC), and flavoring components, as well as other harmful chemicals like propylene glycol, formaldehyde, and heavy metals.[4–6]

Although current e-cigarette use among middle and high school students has fallen from 14.1 % in 2022 to 10.0 % in 2023, e-cigarettes remain the most common tobacco product used by adolescents.[3,7] Among adolescents who vape, 25.2 % of users report daily use.[3,7] Over 2.1 million middle and high school students reported current use of e-cigarettes in 2023, with 89.4 % reporting use of flavored products.[2,7,8] The FDA took action to limit the appeal of flavoring by banning flavored e-cigarette products, excluding menthol and tobacco flavors, and raised

* Corresponding author.
E-mail address: olufunmilola.abraham@uky.edu (O. Abraham).

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the minimum age limit to use tobacco products from 18 to 21 years of age.[9] However, despite these actions, there are still many e-cigarette products and flavored products accessible to young people.[5]

Negative health effects are associated with vaping, ranging from lung injuries and hospitalizations related to alveolar damage to inflammatory reactions and pneumonia.[3–5,10] Other consequences of e-cigarette use include worsening mental health and brain development in adolescents, as well as burns or related injuries from defective batteries and device explosions.[6,8,11] There is mixed evidence that e-cigarettes can be used as a tobacco cessation method in adults, but there is still insufficient evidence to support use by adolescents due to associated risks.[4,10,12] Though there are minimal proven long-term consequences of vaping due to the relative recency of e-cigarette research, the body of literature on vaping health risks continues to grow.[3,4]

Many resources have been developed to educate adolescents to combat the rise of e-cigarette use, but it is especially important to also inform parents of adolescents about the risks of vaping and how that can affect their children.[13,14] Many parents may experience discomfort or uncertainty when addressing these topics with their children, which may contribute to misconceptions about the acceptability and safety of e-cigarette use.[15–17] Effective interventions can be made to help parents of adolescents become educated on important information regarding the potential health effects of vaping, how to discuss topics such as peer pressure, and how to quit e-cigarette use.[15]

There is a need for targeted educational interventions to be disseminated among parents of adolescents on the issue of e-cigarettes and vaping.[18] Pharmacists are easily accessible, community-based healthcare professionals and educators who are often involved in

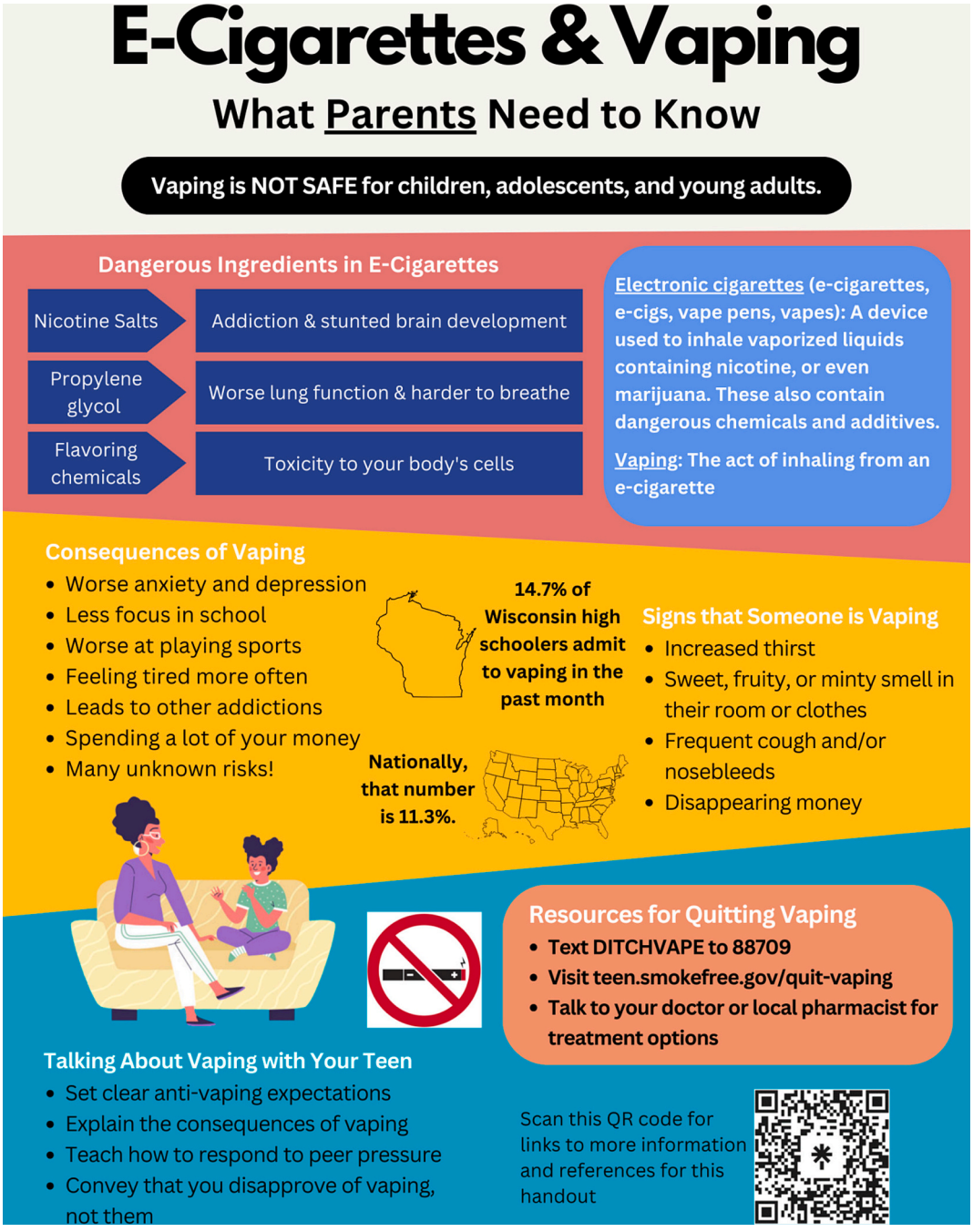

Fig. 1. The Parent E-cigarette and Vaping Educational Resource (P-EVER).

promotion of tobacco cessation through provision of cessation medications and health education dissemination. The American Society of Health-System Pharmacists has a policy position that states pharmacists should discourage e-cigarette use and educate the public on the health risks that vaping poses.[19] However, there are currently no standardized pharmacist-provided interventions on adolescent e-cigarette use in pharmacy practice.[20]

To fill this gap, the research team developed an educational infographic tool entitled "*Parent E-cigarette and Vaping Educational Resource*" (P-EVER) for pharmacists to provide information on important topics related to vaping and access to additional resources (See Fig. 1). The P-EVER tool was designed based on feedback from pharmacists, adolescents, and parents. The P-EVER was created to provide evidence-based information in a way that is easily accessible and understandable to parents, which they could share with their children who may be exposed to vaping.

The P-EVER tool is built from existing resources for vaping from the Centers for Disease Control, the CATCH My Breath Parent Toolkit, Beaumont Health, Truth Initiative, and Smokefree.gov Initiative.[6,11,15–17] The P-EVER provides definitions for e-cigarettes and vaping, dangerous chemicals in e-cigarettes, consequences of adolescent vaping, statistics on adolescent e-cigarette use, signs that someone is vaping, how to talk with an adolescent about vaping, and resources for vaping cessation. The references as well as other additional resources were also linked in a QR code at the bottom of the infographic.

1.1. Objective

The purpose of this study was to examine parents' perspectives on the design, implementation, and use of the P-EVER to inform parents of adolescents and their families about e-cigarette use, risks, cessation resources, and communication tips with adolescents. Additionally, the study explored parents' perspectives on the role of pharmacists in addressing adolescent vaping.

2. Methods

2.1. Study design

This study was granted approval by the university's institutional review board (protocol number 2022–1117). Parents of adolescents were interviewed in this study to gather their perspectives on the P-EVER and how pharmacists could impact and prevent youth e-cigarette use. The study team developed the semi-structured interview guide based on interview guides the study team developed for previous research in vaping and a study on pharmacist perspectives of an opioid safety serious game.[21] The interview guide underwent multiple revisions and pilot testing among three study team members. Interviews asked participants open-ended questions regarding general knowledge and perceptions of adolescent vaping, feedback on the P-EVER, and the overall role of pharmacists in addressing adolescent vaping with adolescents and parents in their communities.

2.2. Participants and recruiting

From January to May 2023, participants were recruited through community pharmacies in Wisconsin using various methods. One method included using recruitment flyers which were distributed to twelve different pharmacies. This recruitment flyer contained information on eligibility for this study, time commitment, compensation, and a QR code linked to an interest form in Qualtrics, a surveying tool. The pharmacy staff were encouraged to distribute these flyers to any of their patients who may be eligible to participate. Over four separate weeks, one study team member also distributed flyers in person at three of the twelve different pharmacies, sharing the flyer with any patient who may be eligible to participate or might know someone who would be eligible. Flyers were also shared through passive means of sitting on a counter or posted on a wall or window in the pharmacy for any patient to pick up or read through.

Additionally, recruitment emails were sent via email newsletters from two pharmacies, with one pharmacy distributing the recruitment email four times via their email newsletter, and the other twice. The recruitment email included the same information as the recruitment flyer, with a website link to the consent form in Qualtrics for this study, as opposed to the interest form QR code shown on the physical recruitment flyer.

Eligible participants were any parents with an adolescent child aged 12 to 18 years old, who were also willing to participate in this study, lived in Wisconsin, spoke and understood English, and had access to a device with a webcam that supported Zoom Video Communications. The adolescent's risk of vaping or use of e-cigarettes was not an eligibility criterion for this study. Potential participants who completed the interest form from the QR code on the recruitment flyers were contacted via email up to 3 times to complete the consent form. Participants who consented were then contacted up to 3 times to schedule a study session.

2.3. Data collection

One study team member interviewed all participants virtually via Zoom at the time and location of the participant's choosing. Study sessions were conducted virtually to provide added convenience and easier access for participation. Each participant was interviewed individually, with all interviews ranging from 17 to 45 min (average 28 min). To gather feedback on the P-EVER, the interviewer sent the participants a link to a Google Drive PDF version of the infographic. Interviews were audio- and video-recorded through Zoom, and then transcribed verbatim for thematic and data analysis. Upon completion of the study session, participants were given a $30 Amazon e-gift card as a shared incentive for both the parent and adolescent, who also participated in the larger study. Results from the adolescent participants have been published.[22]

2.4. Data analysis

All interviews were analyzed by two study team members. An inductive and deductive approach was applied by all analysts to derive content and thematic analysis. A master code book was referenced, and bi-weekly meetings were held throughout the coding process to minimize wording discrepancies. An intercoder reliability kappa score of 0.83 was then calculated measuring how similar the two sets of codes were to each other. The two team members individually came up with themes and sub-themes for the codes using thematic analyses to allow the most prevalent themes and ideas to emerge from the data. NVivo 2020 was used for analysis. The team members, along with the primary investigator, then met to compare and decide on the final themes and sub-themes of which the codes should be grouped.

3. Results

A total of 35 parents participated in this study, with most recruited from in-person recruitment flyers at their pharmacy (25 of 35; 71.4 %), with the rest recruited from the pharmacy email newsletters (8 of 35; 22.9 %) or word of mouth (2 of 35; 5.7 %). Table 1 characterizes the demographics of the study participants. The average age of participants was 35 years old, and 83 % of participants identified as female. The most common level of education completed was a bachelor's degree, with 43 % of parents having graduated from college. On average, parents had 2.7 children of various age ranges.

Four main themes were extrapolated: (1) vaping awareness, 2) P-EVER content and implementation, (3) pharmacist's role, and (4) barriers to pharmacist intervention on vaping. Table 2 provides verbatim quotes along with a summary of the themes and sub-themes.

Table 1
Descriptive statistics of pharmacist ($N = 35$).

Demographic Characteristics	n (%)
Average Age (SD) in years	45.7 (5.9)
Gender	
Female	29 (82.9 %)
Male	6 (17.1 %)
Racial and Ethnic Identity	
White	32 (91.4 %)
Non-white	3 (8.6 %)
Language Spoken	
English	34 (97.1 %)
Multiple	1 (2.9 %)
Education	
High School/Ged, No College	4 (11.4 %)
Associate Degree	4 (11.4 %)
Bachelor's Degree	14 (42.9 %)
Master's Degree	7 (20 %)
Professional/Doctoral Degree	5 (14.3 %)
Marital status	
Married or Living as Married	29 (82.9)
Not Married	6 (17.1)
Number of Children (SD)	2.7 (1.56)
Income	
<$75,000	6 (17.1)
$75,000 - < $100,000	4 (11.4)
$100,000 - < $150,000	8 (22.9)
>$150,000	17 (48.6)

Abbreviation used: SD, standard deviation.

3.1. Theme 1: vaping awareness

3.1.1. Prior vaping knowledge

Many parents had a basic understanding of the topic of vaping, especially in terms of vaping's addictive nature and health risks. Parents were also aware of some key similarities between vaping and traditional cigarettes, notably recognizing nicotine as a shared component. Their understanding highlights that vaping is not inherently safer for adolescents than smoking cigarettes, acknowledging the similar negative effects they share and some unique effects specific to vaping. Parents also recognized the marketing tactics surrounding vaping, particularly the use of appealing flavors and aromas targeted at younger audiences. The P-EVER works to build on the fundamental knowledge that many parents already have.

> "They had all these like, 'Fruity Pebbles' and all these different flavors, like kind of almost targeting towards high school kids or younger kids." – Parent 10.

> "I know that originally, I think, it was intended to help people quit cigarettes, but it seems to have taken on a life of its own and creating more addiction." – Parent 30.

3.1.2. Perceived vaping prevalence

While many parents were uncertain about the exact prevalence of vaping among adolescents, they universally acknowledged its widespread occurrence in youth. After reviewing the reported statistics on adolescent vaping in Wisconsin from the P-EVER, parents perceived the statistics as a conservatively low estimate, understanding the limited reliability of reported statistics and likely underrepresented scale of the problem, as these numbers were self-reported by adolescents. Parents recognized schools as the primary environment where vaping commonly occurs, which they observed themselves or anecdotally from their

Table 2
Main themes, subthemes, and verbatim quotes.

Theme	Subtheme	Verbatim Quote
1. Vaping Awareness	Prior Vaping Knowledge	"They had all these like, 'Fruity Pebbles' and all these different flavors, like kind of almost targeting towards high school kids or younger kids." – Parent 10
	Perceived Vaping Prevalence	"Well, I'm going to say high schoolers, it's got to be 50–75% of kids who have tried it and might be using it." – Parent 25
	Contributing Factors to Adolescent Vaping	"I think it's an out, to try to cope with whatever they may be dealing with at the time, or they think it's cool, so they're doing it. I think that's the bigger issue: they think it's cool, so that's why they're doing it." – Parent 7
2. P-EVER Content and Implementation	Initial Reactions to the P-EVER	"I think it gives you a lot of information. But it's like, easily, it's easy to read, so it's kind of nice, because it's not too much information, but it's helpful." – Parent 10
	P-EVER Utility	"I also like the resources for quitting. I had not seen the 'Text DITCHVAPE,' I have not seen that. I actually wrote it down." – Parent 35
	P-EVER Revisions	"One of the things that would be, in particular to me, would be how to teach kids to say, 'No, thank you', to someone who's being offered a vape." – Parent 25
	P-EVER Dissemination	"At school, number one. Pharmacy, I mean, I think it's helpful. Doctor's office, also, they should be, like, discussing that with, with people." – Parent 21
3. Pharmacist's Role	Perceived Role of the Pharmacist	"I think it's just like, with COVID testing and, and now, like more vaccines are given in the pharmacy, like I just feel like the pharmacy is so much more accessible, and we're in there more often than we ever used to be like, several years ago." – Parent 16
	Pharmacist Interactions with Adolescents	"I think, if [teens are] just there to like, pick something up for their, with their parents, probably not all that receptive. I think if there was a way- I know some pharmacists do some outreach. If there was a way to, like, have the pharmacist come into health class, you know, and talk to the group of kids at the local school." – Parent 30
	Pharmacist Interactions with Parents	"Um, probably like, an 80% of parents, of wanting to listen. And wanting- and I think that's good, because then they could either, you know, bring that information home to their child and talk to them about it." – Parent 27
4. Barriers to Pharmacist Intervention on Vaping	Barriers with Adolescents	"I think one of the major challenges with [teens] talking to anybody, right, is they don't want to get in trouble." – Parent 15

(*continued on next page*)

Table 2 (*continued*)

Theme	Subtheme	Verbatim Quote
	Barriers with Parents	"I didn't know that talking to your pharmacist [about vaping] was a choice, was an option." – Parent 4

children.

"Well, I'm going to say high schoolers, it's got to be 50-75% of kids who have tried it and might be using it." – Parent 25.

"When I talk to my children, it feels like, it, it's so common that, 'Everybody does it, Mom,' you know, like, and it's, it just doesn't seem right." – Parent 27.

3.1.3. Contributing factors to adolescent vaping

Parents highlighted peer pressure and the need for children to fit in as significant contributing factors to the surge in youth vaping. Parents also believed that adolescents were willing to try vaping as they considered it safer than smoking cigarettes and perceived minimal long-term health consequences. Along with this, parents stated that adolescents can be very clever with their methods to hide these vaping products, making it hard to recognize when they are vaping.

"I think it's an out, to try to cope with whatever they may be dealing with at the time, or they think it's cool, so they're doing it. I think that's the bigger issue: they think it's cool, so that's why they're doing it." – Parent 7.

3.2. Theme 2: P-EVER content and implementation

3.2.1. Initial reactions to the P-EVER

Parents acknowledged the P-EVER's clarity, brevity, and readability, considering it an asset for parental guidance on vaping. The inclusion of a QR code linking to supplementary information provided convenient access to additional vaping resources and gave parents the flexibility to explore topics at different levels of detail. Among the different topics presented in the P-EVER, the section highlighting the signs of vaping stood out as the first to capture the readers' attention due to its location on the infographic and the quality of information. Providing relevant strategies to recognize and discuss adolescent vaping was greatly appreciated by parents who were looking for ways to address this difficult topic with their families.

"I think it gives you a lot of information. But it's like, easily, it's easy to read, so it's kind of nice, because it's not too much information, but it's helpful." – Parent 10.

"I like that there's a scan thing there, plus also, like, websites and stuff for, like, if you want to quickly just pop into whatever, instead of having to do a Google search for like, valid information." – Parent 13.

3.2.2. P-EVER utility

The P-EVER was stated to provide detailed insights into harmful chemicals present in e-cigarettes and how these relate to vaping-associated health consequences. Parents highlighted that the P-EVER was effective in clarifying confusing points, such as the distinctions between e-cigarettes and vape pens, and could be used as a tool to reference in the future. The resources provided were appreciated, noting their ability to cater to different levels of understanding from foundational knowledge to more comprehensive materials found in the QR code. The variety of information in different sections also gives parents an opportunity to present select topics to their children.

"The consequences of vaping, I thought, were really helpful too, because they are clear and to the point, and kind of talk about things that resonate with kids, like, worsening their ability to play sports." – Parent 24.

"I also like the resources for quitting. I had not seen the 'Text DITCHVAPE,' I have not seen that. I actually wrote it down." – Parent 35.

3.2.3. P-EVER revisions

Parents expressed interest in different ways to enhance the P-EVER. Common suggestions were to include a section about the ways adolescents may conceal vaping devices, alternative contents in vaping products such as THC, and a comparison between vaping and smoking risks. Furthermore, parents recommend that the P-EVER include additional effective communication strategies for vaping-related conversations. Parents also emphasized the necessity of including a section on long-term and severe risks associated with vaping.

"So, I think, besides just the e-cigarettes, I think the vaping, you know, with marijuana should be emphasized because, you know, it's hard to distinguish." – Parent 14.

"One of the things that would be, in particular to me, would be how to teach kids to say, 'No, thank you', to someone who's being offered a vape." – Parent 25.

3.2.4. P-EVER dissemination

The dissemination of the P-EVER in various settings can be a proactive step in addressing the growing concerns surrounding vaping and its associated health risks. Parents suggested that the educational handout should be readily available in pharmacies as well as recreational facilities, doctor's offices, schools, other community health centers, and digital formats such as social media. Parents stated that it would be valuable to receive the P-EVER along with their medications as a take-home resource to ensure that the information reaches households, however, dissemination strategy into specific pharmacies would be best addressed individually, as the most effective method of implementation varies by pharmacy environment.

"At school, number one. Pharmacy, I mean, I think it's helpful. Doctor's office, also, they should be, like, discussing that with, with people." – Parent 21.

"I think it would be great to keep doing [anti-vaping] commercials, and I think they should also be doing pop-ups on TikToks, Twitters, Facebook, Snapchats, anything that catches parents' eyes." – Parent 9.

"I definitely feel like having a little, a little poster or a pamphlet or something by the drop-off station, that somebody could glance at or take to review while they're waiting for their prescriptions… could be conversation starters, but also provide people information discreetly that then they can take home with them and start conversations at home." – Parent 24.

3.3. Theme 3: pharmacist's role

3.3.1. Perceived role of the pharmacist

Parents suggested that pharmacists could either guide parents through the P-EVER while at the pharmacy or give the P-EVER to parents as a take-home resource. Parents recognized pharmacists as trusted sources of knowledge with substantial education and emphasized the significance of the pharmacist-parent relationship in encouraging open conversations about potentially sensitive topics such as vaping. Participants were seeking additional information from their pharmacists, displaying the opportunity for pharmacist-based interventions for health promotion in community environments.

"I think it's just like, with COVID testing and, and now, like more vaccines are given in the pharmacy, like I just feel like the pharmacy is so much more accessible, and we're in there more often than we ever used to be like, several years ago." – Parent 16.

"I think the first part of it is receiving [the P-EVER] and viewing it on your own, because those people that want to make a change, they got to want to make a change first, before anybody talks to them. So, if they see it first, and then go, 'Hey, I'm interested in this; now I'm going to go talk to a pharmacist.'" – Parent 9.

3.3.2. Pharmacist interactions with adolescents

The effectiveness of interactions between adolescents and pharmacists can depend on the adolescent's attitude. However, around half of the parents noted that their child would be receptive to having a vaping-related conversation with a pharmacist. Parents indicated that adolescents might be more receptive to information from pharmacists in a school setting, as a group environment could enhance comfort levels, and represents an alternative dissemination strategy.

"I think, if [teens are] just there to like, pick something up for their, with their parents, probably not all that receptive. I think if there was a way- I know some pharmacists do some outreach. If there was a way to, like, have the pharmacist come into health class, you know, and talk to the group of kids at the local school." – Parent 30.

3.3.3. Pharmacist Interactions with parents

Nearly all parents said they would be willing to talk with their pharmacist regarding vaping. It was also stated that if the parents had time, they would be very receptive to the information and present it to their children later. Parents of adolescents were seeking further relationships with pharmacists who can provide important health information, and pharmacists initiating this interaction can enhance this relationship.

"Um, probably like, an 80% of parents, of wanting to listen. And wanting- and I think that's good, because then they could either, you know, bring that information home to their child and talk to them about it." – Parent 27.

3.4. Theme 4: barriers to pharmacist intervention on vaping

3.4.1. Barriers with adolescents

Parents highlighted multiple barriers for adolescents to speak with pharmacists, and the most mentioned barrier was the infrequent visits that adolescents make to pharmacies. Adolescents were perceived as reluctant to discuss vaping at the pharmacy with their parents present, as they would not want their parents to know they vape. Parents also noted adolescents' discomfort and lack of interest in having a conversation with pharmacists about vaping. However, this discomfort could be mitigated by the pharmacist developing a rapport with local youth and including adolescents in other health-related discussions as well.

"I don't think every teen or adolescent goes to the pharmacy; I think someone goes for them, picks it up, and then just they get their meds when they get home." – Parent 13.

"I think one of the major challenges with [teens] talking to anybody, right, is they don't want to get in trouble." – Parent 15.

3.4.2. Barriers with parents

Time constraints and busy schedules emerged as the most significant barriers for parents to talk with a pharmacist about vaping. Parents also highlighted the inherent difficulty of the topic of vaping, suggesting it's a sensitive topic to talk about and that pharmacists speaking to their adolescent would be challenging to do appropriately. Additionally, pharmacists were not perceived as a resource for discussing vaping, as the pharmacist typically seems busy, further stressing the importance of the relationship between pharmacist and their patients.

"I feel like nowadays, we're always in a hurry, you know, we want to get in and get out, and that's why we sometimes use the drive thru, right? And I feel like, if [resources on vaping] weren't something that we were asking for, or going there for, it would be received as unsolicited advice, and maybe met with some resistance." – Parent 20.

"I didn't know that talking to your pharmacist [about vaping] was a choice, was an option." – Parent 4.

4. Discussion

Prior research has been conducted to show the importance of educating parents of adolescents about vaping, its related health effects, and how to quit.[11] Many parents possess a surface-level understanding of vaping but lack an in-depth understanding from evidence-based resources that can further support adolescents to quit or abstain from vaping. The P-EVER tool assists parents in discussions about vaping with their adolescents, diminishing the discomfort of a conversation that would typically be difficult to navigate. The tool provides parents with a clearer understanding of vaping, allowing them to identify warning signs and recognize consequences of vaping or using e-cigarettes. Given the multifactorial pressure for youth to try vaping, parents recognized the necessity for an intervention to address these concerns, and parents equipped with the information provided through the P-EVER can be better prepared to recognize opportunities to intervene with their adolescents.[4–6]

Future work is required to determine the feasibility and effectiveness of using a singular P-EVER handout to target different patient populations. This could be a relevant future study as parents and adolescents may value different information in terms of vaping signs, uses, and consequences, further establishing the P-EVER as a tool that can be adapted for use by patients with a variety of health literacy backgrounds. Considering this, the parent version of the P-EVER may not fit the expectations and learning outcomes that other populations would desire. Additional studies could also assess how well the tool is adapted for various educational and cultural contexts, as health literacy levels differ significantly across populations. Understanding the specific needs of different groups could allow for tailoring the tool's content, format, and delivery to maximize its impact. This could enhance not only vaping prevention efforts but also be insightful for public health communication strategies.

The study shed light on parent perspectives on the implementation of a vaping educational infographic, the P-EVER, emphasizing the potential effectiveness of disseminating information in various settings. Parents suggested a proactive approach by making the P-EVER available beyond pharmacies into recreational facilities, doctor's offices, schools, and social media, so that different methods of implementation can help target various age groups and their learning styles. A key strength of this study is its focus on identifying a gap in parental knowledge about vaping and providing a practical tool that facilitates meaningful conversations between parents and adolescents. The feedback from the interviewed parents highlights the importance of using educational materials to initiate conversations and educate families on the risks associated with vaping. Parents valued the overall format of the P-EVER and believed it could be a valuable resource for both adolescents and parents alike. Requests to develop similar community-based pharmacy interventions demonstrate the perceived value of this intervention and the potential for further community-based interventions to address additional topics. Study findings helps to understand the complexities surrounding vaping education and the role of pharmacists in facilitating informed discussions and providing public health education. The study's findings suggest that such educational materials could serve as a foundation for a broader approach involving schools, public health agencies,

and healthcare providers to increase the effectiveness of vaping cessation efforts. This collaboration could lead to the development of more comprehensive public health campaigns and integrate the role of pharmacists as key public health educators.

Parent responses aligned with previous research regarding using various interventions to better highlight the risks of vaping and help parents lead a difficult conversation.[15–17] These interventions were aimed to combat vaping in adolescents but took slightly different approaches for information dissemination.[15–17] Additionally, a study published regarding the Teen *E*-cigarette and Vaping Educational Resource (T-EVER) gathered perspectives from an adolescent population.[22] Both the research studying the T-EVER and this P-EVER study focused on the need to provide accessible and engaging materials to community members. [22] Many findings were similar despite the different populations, such as the desire for digital formats that both adolescents and parents expressed. [22] The shared barriers to initiating conversations about vaping, such as discomfort and lack of knowledge, indicate that tailored interventions can play a critical role in bridging the communication gap between parents and adolescents. [22] These similarities emphasize the potential for the development of shared educational resources across various populations and the potential benefits this infographic can provide. [22] This P-EVER study did produce some unique results as parents were able to provide opinions from a more outward perspective, as many parents have not personally seen vaping by adolescents in different environments.

Another strength of the study is regarding determining parent's perspectives on pharmacists becoming pivotal players in public health education and pharmacist-patient interactions. Parents believed pharmacists to be an adequate source for delivering this resource to parents and families, but that strong provider-patient connection must be formed over many encounters, and, unfortunately, it is often difficult for pharmacists to establish with their patients. Pharmacists initiating the effort to interact with parents and adolescents can reduce barriers to interactions and promote the development of patient-pharmacist relationships, serving to dispel any concerns that pharmacists are unable to have deeper conversations with patients. If patients develop a trusted connection with their pharmacist, they are more willing to accept this information from the pharmacist and pass this information on to their family. Pharmacists, as accessible healthcare providers, can use tools like the P-EVER to enhance their role as public health educators and should be encouraged to incorporate these types of teaching aids into their practice. By implementing these interventions within pharmacies, information can be disseminated by multiple avenues including parents sharing the information by word of mouth or the parents directly providing the infographic to their child.

Parents identified potential barriers to pharmacists implementing the P-EVER in a pharmacy, and time was identified as a significant barrier for all parties involved. This brought forth the idea of pharmacists using the P-EVER as a bag-stuffer in prescription bags or with other patient educational materials, and patients could return with questions later. Providing this valuable information for parents in a low-pressure and efficient manner was highly favorable to busy parents, but still allows for further conversation at a more convenient time if desired. Pharmacists can disseminate this intervention in a variety of ways that best fit their environment such as digitally, in the drive-thru, or as a handout, allowing for broader patient outreach and implementation. The flexibility of the information from this resource encourages exploring digital dissemination methods, such as through pharmacy apps or websites, and could further increase the P-EVER's accessibility to ensure the intervention reaches a larger, more diverse audience. Future studies are necessary to determine the effectiveness of sending home the P-EVER with a patient to review at their own leisure as opposed to a healthcare professional guiding a patient through an infographic at the time of the encounter.

4.1. Limitations

The intercoder reliability method utilizes subjective analysis, and results may vary if thematic analysis is conducted by alternative coders under different circumstances. Participants were all from Wisconsin, predominantly White, female, and college-educated, which limits the generalizability of the study findings to different geographic areas with more diverse populations. The relatively small sample size also limits the generalizability to different socio-economic and cultural backgrounds, where this educational resource may vary in its applicability. Future studies examining the utility, efficacy, and implementation of the P-EVER will include more diverse populations of parents. Interviews conducted via Zoom may lack non-verbal cues and a deeper level of rapport can only be established with in-person interviews. Additionally, the Hawthorne effect of the parents knowing they were being recorded could have influenced participants to provide more socially desirable responses. This study does not evaluate participant opinions over time and how longitudinal use of the P-EVER tool may impact utility. However, this study does provide foundational findings to support future studies that will examine the long-term impact of the P-EVER.

5. Conclusion

By evaluating parents' perspective of this infographic, the P-EVER study highlights the roles pharmacists can play in public health education, particularly in addressing adolescent vaping through parental engagement. Responses from parents emphasized how pharmacists can expand their role advocating for healthier communities by equipping parents with resources to facilitate meaningful conversations with their adolescents. The P-EVER tool empowers families to address vaping-related concerns and offers a practical approach to increasing vaping awareness, with the potential to extend into other community settings through collaborative prevention strategy. Future work is needed to study effective interventions for pharmacists to engage with adolescents, increasing vaping awareness and safety.

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CRediT authorship contribution statement

Olufunmilola Abraham: Conceptualization, Methodology, Validation, Investigation, Resources, Writing – review & editing, Visualization, Supervision, Project administration, Funding acquisition. **Zachary Paulsen:** Formal analysis, Data curation, Writing – original draft, Writing – review & editing. **Evan Slonac:** Writing – review & editing, Writing – original draft, Formal analysis. **Jenny Li:** Data curation, Writing – review & editing, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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