

Vaping Cessation During Pregnancy Among Smoke-Free HOPE Participants: A Qualitative Thematic Analysis

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Abstract

Background

Vaping during pregnancy has emerged as a growing public health concern, yet guidance for vaping cessation within prenatal care settings remains limited and inconsistent. Despite the expanding use of electronic nicotine delivery systems (ENDS), limited research has explored vaping cessation experiences during pregnancy or how pregnant individuals navigate cessation within structured support programs. This qualitative study aimed to explore pregnant women's perceptions of vaping and their experiences with barriers, facilitators, and motivations related to vaping cessation within a tobacco cessation program.

Methods

This qualitative study employed reflexive thematic analysis to explore the experiences of pregnant women enrolled in Smoke-Free HOPE, a community health worker-led tobacco cessation program, who attempted or expressed a desire to quit vaping. Data sources included qualitative data collected from two online focus groups with six pregnant participants and transcripts from post-program key informant interviews with nine pregnant participants.

Results

Analysis identified four core themes: (1) reconstructing identity in pregnancy and motherhood, (2) vaping as emotional regulation, sensory gratification, and habitual regulation, (3) quitting within social worlds of influence and pressure, and (4) navigating institutional support and mistrust, alongside cross-cutting processes of ambivalence and nonlinear quitting. These themes highlighted the challenges participants faced in navigating perceptions of harm related to vaping and the role of relational support within the program in shaping cessation experiences.

Conclusion

These findings highlight the complexity of vaping cessation during pregnancy and the importance of integrating relational, context-sensitive, and pregnancy-specific support, as participants often identified their children or infants as a central motivation for quitting.

1. Background

Vaping, commonly involving the use of electronic nicotine delivery systems (ENDS) or e-cigarettes, has emerged as a significant public health concern due to growing evidence linking these products to nicotine dependence, respiratory and cardiovascular effects, and potential developmental harms (1-5). Most e-cigarettes and ENDS contain nicotine, a substance with strong addictive potential that may negatively affect adolescent brain development and fetal development during pregnancy (2). In addition

to nicotine exposure, vaping aerosols can contain potentially harmful constituents, including toxic metals, volatile organic compounds, ultrafine particles, and carcinogenic chemicals (2).

Overall, ENDS use increased substantially in the United States between 2014 and 2022, with emerging evidence suggesting a shift toward more persistent and frequent nicotine use over time. In a longitudinal analysis of U.S. youth and adults in the PATH study, individuals who used ENDS during the latter part of 2019–2022 were significantly more likely to transition to and maintain frequent vaping than those in earlier cohorts (6). These trends coincide with the widespread adoption of high-nicotine salt-based products that deliver nicotine more efficiently and may increase the risk of nicotine dependence (6). Although some evidence suggests that frequent ENDS use among adults may support combustible cigarette discontinuation, the increasing prevalence and persistence of vaping raise important concerns for reproductive-age populations, including pregnant individuals (6).

In 2024, approximately 1.63 million U.S. middle and high school students reported current e-cigarette use, with 38.4% reporting frequent use and 26.3% reporting daily use (7). In addition, national e-cigarette sales increased by 47% between 2019 and 2023, while sales of disposable devices increased by more than 500%, reflecting the rapid expansion of high-nicotine, flavored vaping products in the U.S. market (7).

These broader trends raise important concerns for pregnant populations, among whom ENDS use has also increased in recent years. Among pregnant women in the United States, analysis of the 2016 to 2019 Pregnancy Risk Assessment Monitoring System (PRAMS) indicates that ENDS use among pregnant individuals increased between 2016 and 2019, although prevalence remained lower than combustible cigarette smoking (8). The analysis reported that exclusive ENDS use before pregnancy increased from 0.8% to 1.6%, while exclusive ENDS use during pregnancy increased from 0.4% to 0.6% over the study period (8). In 2019, 4.3% of women reported ENDS use during the three months before pregnancy, and 1.3% reported use during the last three months of pregnancy (8). The study also found that dual use of cigarettes and ENDS was more common than exclusive ENDS use during pregnancy, and fewer than half of individuals who used both products before pregnancy discontinued both during pregnancy, suggesting persistent nicotine exposure among some pregnant individuals (8). A separate analysis of PRAMS data found that 0.5% of the women reported using e-cigarettes exclusively, while 0.7% of the women reported dual use during the last three months of their pregnancy (9). Among 5,875 women in this same analysis who self-reported e-cigarette use and quit during pregnancy, it was also found that those with a greater frequency of e-cigarette use before pregnancy were less likely to quit (9).

The persistence of ENDS use during pregnancy is clinically concerning due to potential risks to maternal and fetal health (10-12). Although some individuals perceive vaping as a safer alternative to combustible tobacco and a means of managing nicotine cravings, e-cigarettes are not approved by the United States Food and Drug Administration as a smoking cessation aid, and evidence regarding their safety during pregnancy remains limited (13). Emerging research suggests potential associations between vaping during pregnancy and adverse outcomes, including fetal death, small-for-gestational-age births, high-risk

pregnancies, and impairments in embryonic development (10-12). A recent systematic review further observed an association between e-cigarette use and depressive symptoms during the perinatal period, indicating that vaping may occur together with mental health challenges that could complicate cessation efforts among pregnant individuals (14). A recent systematic review and meta-analysis also found associations between prenatal nicotine exposure and deficits in cognitive, emotional, and behavioral self-regulation as well as motor development among offspring, while highlighting limited evidence related to e-cigarette use during pregnancy (15). Despite these concerns, continued vaping during pregnancy remains common among some individuals (16).

Although smoking cessation programs are widely available, vaping cessation may involve distinct behavioral, sensory, and social factors that differ from combustible cigarette smoking. However, there is limited research addressing vaping cessation specifically or the unique barriers pregnant individuals encounter when attempting to quit vaping. Existing literature has mainly concentrated on smoking cessation outcomes, with limited information about vaping-related behaviors or experiences. Moreover, little is known about how pregnant individuals understand vaping-related risks, navigate cessation attempts, or experience support within smoking cessation programs. A recent qualitative study indicates that pregnant individuals often encounter conflicting or outdated information about vaping, which contributes to uncertainty about quitting (17). These gaps highlight the need for qualitative inquiry to better understand the lived experiences and contextual factors influencing vaping cessation during pregnancy.

1.1 Aims

This qualitative study aims to explore the experiences of pregnant women who enrolled in a maternal tobacco cessation program to quit vaping. Specifically, the study addressed three research questions: (1) How do participants perceive and experience vaping during pregnancy? (2) What factors influence their efforts to quit vaping, including perceived barriers and facilitators? (3) What motivates pregnant women to seek support for vaping cessation?

1.2 Application of Theory

The health belief model (HBM) has been widely used to understand how individuals perceive health risks and engage in behavior change (18). The model consists of six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action (18). In addition, the social cognitive theory (SCT) highlights how behavior is shaped through dynamic interactions between personal factors, environmental influences, and observed behaviors (19). While these frameworks have been used to examine vaping behaviors among young adults, little research has applied them to understanding vaping cessation during pregnancy (20, 21).

2. Methods

2.1 Study Design

This qualitative study employed reflexive thematic analysis to explore vaping cessation experiences during pregnancy. Reflexive thematic analysis emphasizes the active role of the researcher in generating themes through deep engagement with the data (22, 23). Data sources include post-program key informant interviews (KI) and focus groups (FG) conducted with participants enrolled in the Smoke-Free Household and Parent (Smoke-Free HOPE) program (24).

2.2 Setting and Parent Study

This study was conducted within the context of Smoke-Free HOPE, a pilot feasibility randomized controlled trial evaluating community health worker (CHW)-delivered maternal tobacco and nicotine cessation interventions integrated into community and prenatal care settings in San Bernardino and Riverside Counties, California. The parent trial enrolled pregnant individuals who were currently or had recently quit using tobacco and/or nicotine products, including combustible cigarettes and electronic cigarettes or vaping products, who expressed interest in quitting. The protocol has been reported elsewhere (24).

Participants received home- and telehealth-based behavioral cessation support delivered by trained CHWs through one of two intervention models: a CHW-Brief Advice model using an evidence-based smoking cessation curriculum (SCRIPT®) or a CHW-Patient Navigation model designed to connect participants with state and community cessation resources. The present qualitative study focused specifically on participants who reported vaping during pregnancy and participated in the cessation intervention.

2.2 Eligibility, Recruitment and Sampling

Participants included pregnant women who had completed the eight-week Smoke-Free HOPE program. Eligible participants were aged 18 years or older, pregnant at the time of program participation, and reported current vaping or had recently quit, or expressed a desire to quit vaping or stay quit. Participants were excluded if they declined participation in audio-recorded focus groups or interviews. Participants for the focus groups were recruited following program completion through email and text message invitations by the program coordinator. Focus group participants received a \$60 Amazon gift card as compensation for their time.

Purposive sampling with an emphasis on capturing variation in participant experiences was used to explore diverse perspectives related to vaping cessation during pregnancy. The sample reflected the limited number of eligible participants enrolled in the program who reported vaping during pregnancy and interest in quitting. Consistent with reflexive thematic analysis, sample adequacy was considered in relation to the study aims, richness of participant accounts, and the availability of eligible participants enrolled in the program (25). All nine participants completed post-program KI interviews ($n = 9$), and six

of these participants also participated in the focus groups (n = 2). Table 1 presents the demographic characteristics of the participants upon enrollment in the program.

Table 1	
<i>Baseline Characteristics of Participants Included in the Analysis (N = 9)</i>	
Characteristic	<i>n (%) or Mean (Range)</i>
Age (years)	27.11 (20-36)
Race	
Hispanic/Latina	4 (44.44%)
American Indian	1 (11.11%)
Non-Hispanic White	1 (11.11%)
Non-Hispanic Black	1 (11.11%)
Other/Multiracial	2 (4.44%)
Educational Level	
High School or less	4 (44.44%)
2-Year Junior or Community College	1 (11.11%)
Vocational, Business, or Trade School	4 (44.44%)
Marital/Partner Status	
Married	1 (11.11%)
Living with partner	4 (44.44%)
Separated	1 (11.11%)
Single/Not partnered	3 (33.33%)
Household Total Income	\$18,760.57 (\$0.00 - \$59,448.00)
Health Coverage	
Medi-Cal/Inland Empire Health Plan	9 (100%)
WIC Participation	9 (100%)
Past 30-day vaping (days)	15.78 (0-30)
Cigarette Use (Past 12 Months)	
Yes	4 (44.4%)
No	3 (33.3%)
Average Daily Vaping Frequency (times/day)	23.71 (4-100)
Past-Year Vaping Quit Attempt	
0 times	2 (22.22%)
1 time	2 (22.22%)
3 - 5 times	4 (44.44%)
Readiness to Quit Vaping (0 - 10 scale)	8.89 (5-10)

Note[AP1] [JL2] : Data are presented as n (%) unless otherwise indicated. Continuous variables (age, past 30-day vaping days, average daily vaping frequency, and readiness to quit vaping) are reported as mean (range). Percentages may not total 100% due to rounding. Percentages were calculated based on available responses for each variable. Missing responses were excluded from calculations. One participant reported a household income of \$0 and did not indicate “Refused to Answer” or “Don’t Know.”

Participants could select more than one race/ethnicity category. Categories for educational level, marital/partner status, health coverage, and past-year quit attempts are mutually exclusive.

2.3 Data Collection

Data collection included post-program KI interview transcripts and focus groups with participants who completed the Smoke-Free HOPE program. KI interviews explored participants' vaping history, experiences with vaping during pregnancy, perceived barriers and supports for quitting, and experiences participating in the smoking cessation program. Insights from these interviews informed the development of the focus group guide and areas for deeper exploration related to vaping cessation during pregnancy. The semi-structured focus group guide was further informed by constructs from the Health Belief Model and Social Cognitive Theory and explored participants' experiences with vaping cessation during pregnancy, perceived barriers and facilitators for quitting, social influences, and their experiences receiving cessation support throughout the program (18, 19). Sample focus group questions are provided in *Supplementary S2*.

Two online focus groups were conducted using HIPAA-compliant Zoom software and were audio- and video-recorded with participant consent. All recordings were initially transcribed verbatim using the automated transcription feature in Microsoft Word. Transcripts were then de-identified and reviewed for accuracy before analysis. As a quality-control measure, 20% of transcripts were compared with the original recordings and were determined to be within acceptable limits for transcription accuracy.

2.4 Analysis

Data were analyzed using Braun and Clarke's reflexive thematic analysis methodology (22, 26, 27). This approach emphasizes the active role of the researcher in generating themes through deep engagement with qualitative data and prioritizes interpretive meaning-making over coding reliability approaches (27). Analysis was conducted from a contextualist orientation, recognizing participants' experiences as shaped by individual meaning-making and broader social and environmental influences. Both semantic and latent levels of analysis were used to examine participants' explicit accounts and the underlying meanings shaping their experiences.

Transcripts were uploaded into NVivo 14 qualitative data analysis software to support data organization and analysis (28). The first author served as the lead analyst, with ongoing analytic input from the supervising researcher. The supervising researcher also reviewed transcripts and participated in interpretative discussions throughout the analytic process. The first author engaged in repeated reading of transcripts to develop familiarity with the data, while documenting initial analytic impressions and reflexive memos (23, 26). Initial codes were generated inductively from the data and iteratively refined throughout the analytic process. Coding involved ongoing comparison across transcripts to examine

similarities and differences within the dataset. An analytic coding document was maintained to document coding decisions and support analytic organization.

Codes were subsequently examined for patterns of shared meaning and organized into candidate themes relevant to participants' experiences with vaping cessation during pregnancy. Emerging codes, candidate themes, and thematic interpretations were discussed among the research team to enhance coherence, distinction, and interpretive depth. All team members contributed to the final determination, refinement, definition, and naming of themes and core themes. These discussions contributed to the refinement of the codebook and thematic structure while remaining consistent with the interpretive principles of reflexive thematic analysis. Final themes were defined and named to reflect concise and analytically meaningful patterns related to the research questions (22, 23, 27). Although coding and theme development were conducted inductively, HBM and SCT served as sensitizing frameworks to support the interpretation of participants' perceptions of risk, barriers, self-efficacy, social influences, and environmental contexts related to vaping cessation during pregnancy (29).

2.5 Rigor and Trustworthiness

Throughout the analytic process, reflexivity, analytic rigor, and trustworthiness were supported through reflexive memos, peer debriefing, and ongoing analytic discussions among research team members. An audit trail was also maintained to document coding decisions, analytic reflections, evolving interpretations, and theme development throughout the analysis. These strategies acknowledged researcher subjectivity as an integral component of the analytic process while promoting transparency and conceptual coherence across the study aims, methodology, and interpretation of findings (27).

2.6 Researchers Positionality

The primary researcher and lead analyst is a public health educator and Certified Health Education Specialist (CHES) with training and experience in health behavior change, which informed the interpretation of participant narratives. The primary researcher acknowledges not having personal experience with smoking or pregnancy, which may have created distance from participants' lived experiences. The supervising researcher is the principal investigator of the parent study with training in tobacco control and smoking cessation. Reflexive memos and ongoing consultation with research team members were used throughout the study to support critical reflection, examine researcher assumptions, and maintain attention to participants' perspectives during analysis. The term "pregnant women" is used to reflect the self-identified gender of study participants; however, the authors acknowledge that individuals of diverse gender identities may experience pregnancy.

2.7 Ethics

The study received approval from the Loma Linda University Institutional Review Board (IRB # 5220112). All participants provided informed consent prior to participation in the interviews and focus groups, were informed of the voluntary nature of the study, and were given the right to withdraw at any time.

[AP1]Household income – Concerned that range includes Zero, I think if a participant gave zero that should be Unknown/missed.

[JL2]That's a very valid concern. After looking back into their Study Visit 1 responses, only 1 participant indicated \$0 and did not mark "Refused" and/or "Don't Know"

3. Results

Four core themes captured patterns of shared meaning related to participants' experiences of vaping and cessation during pregnancy: (1) Reconstructing identity in pregnancy and motherhood, (2) vaping as emotional regulation, sensory gratification, and habitual regulation, (3) quitting within social worlds of influence and pressure, and (4) Navigating institutional support and mistrust. In addition, two cross-cutting processes, (1) persistent ambivalence and (2) nonlinear quitting, and one contextual element related to cross-substance dynamics were identified across themes. Pregnancy functioned as a central organizing context shaping participants' identities, behaviors, and decision-making across themes. See *Supplementary Table S1 for exemplar quotes*.

3.1 Theme 1: Reconstructing Identity in Pregnancy and Motherhood

Participants described pregnancy as a turning point in quitting vaping that prompted a re-evaluation of identity, particularly in relation to maternal responsibility and fetal well-being. Vaping was no longer understood as individual behavior but as one with direct consequences for the developing fetus, which reframed harm as relational. As one participant expressed, *"You can't even bring it to your lips because you're thinking that it's going straight to your kid,"* highlighting how pregnancy shifted perceptions of risk and accountability. Similarly, another participant emphasized this shift by stating, *"I knew I shouldn't be doing it while I'm pregnant...it's not just me anymore,"* reinforcing how pregnancy reoriented their behavior because of the developing fetus.

This identity reconstruction was often accompanied by a moral reorientation, in which participants evaluated their behaviors against expectations of being a "good mother." Decisions such as quitting vaping or prioritizing breastfeeding were framed as moral choices tied to maternal identity. One participant reflected this shift by explaining, *"It's either breastfeeding or continue doing this...so I'll put that down,"* highlighting how health behaviors were weighed through a maternal lens. Feelings of guilt and accountability further reinforced this shift, particularly when participants linked vaping to perceived negative outcomes for their child. For example, one participant shared, *"I [would] blame myself...[because]*

she has wheezing,” illustrating how responsibility for child health outcomes became internalized and emotionally salient.

Children and family roles also acted as reinforcing mechanisms for identity transformation. Participants described how interactions with their children prompted reflection and motivation to quit. As one participant noted, *“I was hearing my kids in my head telling me, just give it [vaping] up, mom,”* demonstrating how maternal identity was shaped not only internally but also through relational expectations and social feedback.

For some participants, identity reconstruction developed over time through reflection and supportive interactions. One participant described how conversations with a CHW prompted a shift from quitting solely *“for the baby”* toward recognizing her own sense of self and agency: *“...I shouldn’t just be doing this for my kids. I need to do it for myself...because if I can’t do it for myself...I feel like that’s why I failed every time...”* This highlights how identity transformation was not only prompted by pregnancy, but also actively shaped through reflective processes and relational support.

Some participants described their motivation to quit as primarily externally driven, *“for the baby...but honestly, that’s kind of it,”* rather than their own sense of identity change. This suggests that while pregnancy initiated a shift in perspective, the process of identity reconstruction remained uneven and incomplete for some participants.

These experiences suggest that pregnancy often prompted participants to reevaluate vaping through the lens of maternal accountability, fetal protection, and expectations of motherhood. Pregnancy created a sense of heightened accountability in which participants increasingly interpreted vaping not only as personal behavior, but also as one connected to the health and well-being of their developing child. However, identity transformation was not always fully internalized, as some participants continued to experience quitting primarily as an externally motivated responsibility rather than a personally integrated sense of self-change.

3.2 Theme 2: Vaping as Emotional, Sensory and Habitual Regulation

Vaping was described as serving both emotional, sensory, and habitual regulatory functions during pregnancy. Participants frequently used vaping to manage stress, anxiety, and emotional overwhelm, positioning it as a primary coping mechanism. As one participant explained, *“That’s the only way I cope... I don’t want to go out there and do something stupid,”* illustrating how vaping was used to maintain emotional control during periods of distress. Similarly, another participant described vaping as a means of calming heightened emotional states, noting that *“it calms you down...[I’m] less on the hypervigilant side,”* highlighting its role in regulating anxiety during pregnancy. For some, this reliance was rooted in longer-term emotional experiences, with one participant describing how vaping *“basically...took my pain*

away,” when she was experiencing depression. This reflects how vaping was embedded within broader histories of coping with distress.

Beyond emotional regulation, vaping was also experienced as a sensory and habitual practice. Participants described automatic patterns of use embedded in daily routines, such as waking up and going to sleep with a vaping device. For example, one participant shared, *“I’d wake up with it in my hand... fall asleep with it,”* reflecting how vaping became integrated into daily routines and bodily rhythms. Another participant described the persistence of habitual action even during quit attempts, stating, *“It’s like your hand motion...you go in to reach and you’ll go smoke it. And it’s not there,”* demonstrating how ingrained motor patterns continued to shape behavior even in the absence of the device.

Sensory features, including flavor, visual cues and physical sensation, reinforced continued use by linking vaping to pleasurable bodily and sensory experiences. Participants emphasized the role of taste and physical sensation in sustaining use, with one participant noting, *“The candy taste is what gets me,”* or *“I like to see the smoke...it’s kind of mesmerizing, I guess,”* suggesting that vaping was not only functional but also experientially rewarding. These sensory and habitual dimensions reinforced continued use and made cessation more difficult.

For some participants, vaping also functioned as an emotional substitute, particularly in the context of isolation. Descriptions such as *“He [vape] was my friend... I didn’t have friends”* highlight how vaping provided a sense of companionship and emotional support in the absence of social connections. In this way, vaping extended beyond a coping behavior to become embedded within participants’ relational and emotional worlds.

Even during attempts to quit, participants described returning to vaping in moments of heightened stress or limited support, emphasizing its role as a default coping mechanism. As one participant explained, *“you go back to the one thing that was there when you had no support,”* illustrating how vaping remained a familiar and reliable source of regulation even when participants were actively trying to quit.

Together, these descriptions suggest that vaping functioned as an emotional, sensory, and habitual form of regulation during pregnancy, particularly in the context of stress, emotional vulnerability, and limited social support. For many participants, attempts to quit vaping during pregnancy involved not only nicotine cessation, but also disruption of an established coping mechanism woven into daily routines, bodily habits, sensory experiences, and emotional support. Pregnancy therefore created a complex tension between participants’ desire to protect maternal and fetal health and their continued reliance on vaping as a source of stability and regulation.

3.3 Theme 3: Quitting Within Social Worlds of Influence and Pressure

Participants' experiences of quitting were deeply shaped by the social environments in which vaping was embedded. Vaping was often normalized within participants' social networks, reducing perceived risk and making cessation more difficult. As one participant noted, *"Half their parents [in peer group] don't even care... they would if it was cigarettes,"* reflecting shifting social norms in which vaping was viewed as more acceptable and less harmful. For some participants, this normalization was reinforced by their immediate environments, with one noting, *"I'm in an environment now where literally everyone in my house smokes [vapes],"* highlighting how constant exposure made quitting challenging. This normalization contributed to an environment where quitting required not only individual motivation but also resistance to widely accepted behaviors.

Social availability and exposure further reinforced use. Participants described easy access to vaping devices through family members and peers. As one participant explained, *"The only issue is they're accessible...I could walk up to my cousin or any member of my family and be like, 'hey, can I hit your vape?'"* illustrating how vaping devices were often readily accessible within participants' immediate social environments. In some cases, direct encouragement from others to continue vaping created additional pressure, complicating quit attempts. For example, one participant described being offered vapes by others, stating how they would say, *"Just have another one...try this flavor,"* highlighting how social interactions could actively undermine cessation efforts, even during pregnancy.

At the same time, social relationships could also facilitate cessation. Encouragement from others, including children and supportive peers, acted as a motivator to quit. One participant described how external validation, such as *"You're doing a good job...better you than me,"* reinforced their efforts in quitting vaping. Children in particular played a meaningful role in shaping participants' motivation, with one participant recalling her children's feedback, *"Mom, that's bad for you,"* which reflects how family dynamics reinforced awareness of harm and responsibility.

Participants also described actively restructuring their social environments to support quitting. This included setting boundaries, limiting exposure to vaping, and distancing themselves from relationships that encouraged use. As one participant emphasized, *"I had to stay away from a lot of people,"* illustrating the extent to which quitting required changes to social networks. Others described the need to actively communicate these boundaries within ongoing relationships, with one participant noting, *"Basically, you got to tell them exactly how you're trying to quit and how it makes you feel when they vape around you... 'Closed mouths don't get fed'....,"* highlighting how cessation required both avoidance and assertive communication. In some cases, these changes resulted in a sense of social loss, as participants described distancing themselves from friends or environments associated with vaping, *"I dropped all of those friends, but the only person that really vapes now is my fiancé, but he doesn't do it anywhere near me..."* For some, this distancing was understood as a necessary but difficult trade-off, reflecting the emotional and relational costs of quitting within socially embedded environments. These shifts highlight how quitting was not only an individual process but one embedded within, and often requiring the restructuring of, social relationships.

These findings suggest that vaping cessation during pregnancy was deeply shaped by participants' social environments, where vaping was simultaneously normalized, socially reinforced, and difficult to avoid. Pregnancy often intensified participants' awareness of social influences, particularly as family relationships, peer interactions, and maternal responsibilities became more central to decisions about quitting. For many participants, cessation required not only individual motivation, but also active negotiation of social boundaries, restructuring of relationships, and distancing from environments that reinforced vaping.

3.4 Theme 4: Navigating Institutional Support and Mistrust

Participants described complex and often contrasting interactions with institutional systems, including healthcare providers and program staff, that shaped their experiences of quitting. CHWs were frequently identified as trusted sources of support, with participants emphasizing the importance of relational, nonjudgmental interactions. One participant described being able to *"talk to her like she was a therapist,"* underscoring how emotional safety facilitated openness and engagement. Another participant reflected on the depth of this relationship, stating that their CHW *"became more [like] family than...just someone that was there to help me,"* illustrating how CHWs were perceived as extending or compensating for limited social support systems.

Participants also described how these relational interactions fostered emotional safety and a sense of being heard and understood, which encouraged trust, openness, and continued engagement in vaping cessation efforts. For some, positive interactions with healthcare providers reinforced this support, particularly when providers offered practical resources and encouragement to quit. One participant shared how her home nurse, who would assist in her son's well-being until he turned two, recommended the program to her, *"She was the one that was like, oh, you should sign up for this...she gave me a link...and I signed up online."* These experiences highlight how trust and nonjudgmental care functioned as key facilitators of engagement within institutional settings.

In contrast, other participants experienced interactions with institutional systems that were often characterized by mistrust, fear, and uncertainty. Some of them expressed concerns about stigma and potential consequences, such as being labeled or involvement of child protective services, which discouraged open disclosure of vaping behaviors and contributed to hesitation in engaging with services. As one participant recalled after being "labeled" for vaping when seeking community resources:

...I was in the office, and they were asking me if I smoked or if I vaped, and I said 'yes'...at the end of it, they're like, 'you've been flagged for vaping'. I was like, I don't even really vape too much, I could stop like at any time. And they were like; do you want services? And I declined because, I didn't want that; to be labeled as 'oh, I'm a smoker....'

This quote illustrates how fear of labeling and surveillance shaped decisions to disengage from support systems. For some, this mistrust extended beyond specific encounters, reflecting broader concerns about how information might be used within institutional systems, leading participants to limit what they disclosed or to avoid seeking help altogether.

Participants also described gaps in provider support, particularly when advice to quit was not accompanied by actionable guidance. One participant noted that providers would say, *“that you should quit, but they don’t really give you any advice or anything on it,”* while another participant shared, *“can’t quit if y’all don’t want to help,”* which reflects their feelings of uncertainty and lack of direction afterward. Others described navigating these systems cautiously, weighing the potential benefits of support against perceived risks of engagement, which further shaped how and when they accessed care. Inconsistent messaging from providers further contributed to confusion, as participants encountered differing perspectives on the risks of vaping and appropriate cessation strategies.

Practical barriers, such as accessibility of services, further influenced engagement. Participants described challenges related to attending appointments or navigating services during pregnancy, which affected their ability to access support consistently. Participants would express gratitude for the flexibility of being able to meet with the CHW virtually or in-person, stating that *“Virtual makes things easier...if I can’t get a babysitter,”* which highlights the additional responsibilities that pregnant mothers balance in addition to their attempts to quit. Moreover, some participants found that meeting in person with their CHW creates a more interpersonal relationship that is not found in the virtual space. For example, a participant shares that *“You don’t get the same feeling or vibe off of someone...until you get that human connection...”*

These perspectives suggest that engagement with vaping cessation support during pregnancy was shaped not only by the availability of services, but also by how institutional interactions were experienced emotionally and relationally. Trust, empathy, accessibility, and nonjudgmental communication fostered openness and continued engagement, while fear of stigma, surveillance, and unclear guidance contributed to hesitation, limited disclosure, and disengagement from support systems. During pregnancy, these interactions often carried heightened and emotional significance as participants weighed the perceived benefits of seeking support against concerns about judgment, labeling, and maternal responsibility.

3.5 Cross-Cutting Processes: Ambivalence and Nonlinear Quitting

In addition to the core themes, two cross-cutting processes were identified across participants’ experiences: persistent ambivalence and nonlinear quitting. Participants frequently expressed conflicting beliefs about vaping, simultaneously recognizing its potential harm while continuing to perceive benefits such as stress relief. This tension was evident in statements such as, *“I knew deep*

down that I was harming myself...but at that moment of me doing it, I honestly didn't care [about] the aftermath...," reflecting an ongoing struggle between knowledge and behavior. Similarly, another participant described this internal conflict by stating, *"It helps me, but then I feel bad right after,"* illustrating the cyclical tension between relief and guilt. Some participants also framed vaping as comparatively less harmful, suggesting that it was *"better compared to cigarettes,"* which further complicated how risks were interpreted and justified in the moment.

Ambivalence also emerged as a dynamic negotiation between desire and resistance for several participants. Participants described wanting to quit while simultaneously feeling reluctant to give up vaping. As one participant noted, *"A part of me didn't want to stop,"* highlighting how motivation to quit was often unstable and contested. During their quit journey, participants also expressed difficulty in distinguishing between withdrawal and pregnancy symptoms. One participant described this uncertainty, stating, *"...it was hurting like withdrawals. But then, since I was pregnant, it was hard to tell,"* reflecting the challenges in interpreting bodily sensations. Some participants reported gaining clarity after consulting with their CHW, while others continued to attribute these sensations to pregnancy. This ambiguity complicated participants' ability to identify and manage withdrawal during pregnancy. At times, this ongoing tension between perceived harms and immediate relief contributed to moments of continued use or return to vaping, illustrating how ambivalence directly shaped behavior. These accounts demonstrate how ambivalence was not a temporary state but an ongoing process that shaped participants' engagement with cessation across emotional, social, and institutional contexts.

Quitting was experienced as a fragile and iterative process rather than a linear progression. Participants described repeated cycles of quitting and relapse, fluctuations in confidence, and moments of near use where habitual behaviors resurfaced. One participant summarized this pattern by stating, *"We're able to make the quit date, relapse, quit again, relapse, and then quit again, and then back on the relapse part,"* which reflects the repetitive nature of cessation attempts. Others described moments of automatic behavior during quit attempts, such as, *"...I picked it up and I was gonna hit it. And like, I stopped myself; just in that moment, I forgot I was pregnant, forgot that I stopped smoking [vaping],"* which illustrates how embodied habits persisted even during efforts to stop.

Participants also described fluctuations in confidence and progress, with some framing their efforts in terms of short-term milestones. For example, one participant reflected, *"...I had tried to stop a week before and I went three days...and then I had tried again,"* highlighting the instability of quit attempts over time. Stress and emotional overwhelm were frequently described as reasons why vaping provided short-term relief despite the risks. As one participant noted, *"Like now I need it for like relaxation...me time or when I was stressed,"* which reinforces how vaping was viewed as a tool for emotional regulation even when its harms were acknowledged. Concerns about sustaining cessation beyond pregnancy further highlighted the fragility of this process, with one participant noting, *"I always kind of tell [CHW] I'm a little scared of postpartum...I feel like I'm going to be tempted to go back because I'm not doing it for my child,"* which points to anticipated relapse in the postpartum period.

Together, these patterns illustrate how cessation involved continuous negotiation rather than a single decision. Ambivalence and nonlinear quitting cut across emotional reliance, social environments, and institutional interaction, shaping how participants attempted to reduce or stop vaping over time.

3.6 Cross-Substance Dynamics

For some participants, vaping cessation was further complicated by cross-substance dynamics, including substitution and co-use. Participants described shifting between substances, such as cigarettes or cannabis, to manage cravings, stress, or pregnancy-related symptoms. For example, one participant explained, *"If I don't vape, I'll end up smoking instead,"* illustrating how attempts to quit vaping could lead to substitution with other nicotine products. Others described interconnected patterns of use, where engagement with one substance triggered another, such as, *"I can't even get through half my drink... I need a cigarette,"* highlighting how substance use behaviors were linked across contexts.

In some cases, participants adapted their substance use based on situational factors, particularly in relation to pregnancy and parenting contexts. One participant described modifying their behavior depending on their environment, stating, *"I vape around my kids... smoke cigarettes elsewhere,"* reflecting attempts to manage perceived harm while maintaining substance use. Others described using different substances for specific functional purposes, such as managing nausea or stress, *"So when I was pregnant, I did have to smoke marijuana and my OB and everybody knew because I couldn't hold down [eat] literally anything... When I got pregnant... I lost weight, like I dropped extremely bad weight... I was like, either I'm gonna have to smoke [marijuana] or I'm gonna end up having a dead baby."* suggesting that substance use was not interchangeable but strategically adapted to meet immediate needs.

These accounts suggest that some participants were not simply continuing or discontinuing use but actively negotiating and adjusting their behaviors across substances and settings. These patterns highlight how vaping was embedded within broader substance use systems rather than occurring in isolation. Rather than fully disengaging from nicotine or substance use, some participants often adapted their behaviors in response to changing circumstances, stressors, and environments. In this way, cross-substance use functioned as an adaptive strategy within limited contexts, even as it complicated cessation efforts. This contextual element underscores the importance of understanding vaping cessation within a wider behavioral and situational framework.

4. Discussion

This study addressed three research questions related to perceptions, barriers, and motivations for vaping cessation during pregnancy within a CHW-led maternal tobacco and nicotine cessation intervention. Analysis identified four core themes and two cross-cutting processes. Findings suggest that vaping cessation is a complex and evolving process shaped by identity shifts, emotional regulation, sensory and habitual patterns of use, and social and institutional contexts. These findings support broader understandings of vaping cessation as a dynamic and socially embedded process, consistent

with social cognitive theory perspectives that emphasize reciprocal interactions between individual, behavioral, and environmental factors (30).

Pregnancy functioned as a central organizing context, prompting participants to re-evaluate their identities in relation to maternal responsibility and fetal well-being. In this context, vaping was reframed as a relational behavior, where perceived harm extended beyond the individual to the developing fetus. This aligns with literature describing pregnancy as a “teachable moment,” in which shifts in self-concept and responsibility motivate health behavior change (31). Identity reconstruction also appeared to evolve over time, with some participants shifting from externally driven motivations toward more internally integrated reasons for quitting. However, identity transformation was not uniformly internalized, as some participants described quitting primarily as an obligation to the fetus rather than a fully integrated sense of self-change, highlighting variability in how pregnancy shapes motivation. These observations suggest that pregnancy introduced an ongoing tension between the immediate perceived benefits of vaping and concerns about fetal well-being, complicating participants’ efforts to reconcile existing coping behaviors with emerging maternal identities. Moreover, while identity reconstruction emerged as a distinctly pregnancy-specific process, several barriers and facilitators identified in this study were consistent with broader vaping cessation literature. Previous qualitative research among young adults has highlighted the role of emotional regulation, habitual use patterns, social influences, and environmental factors in shaping vaping cessation efforts (32).

Although participants were provided with information about the health effects of vaping, this information appeared to reinforce pregnancy as the primary motivator for cessation rather than independently driving behavior change. Broader shifts in public perceptions of e-cigarette harm may contribute to this dynamic. For example, the proportion of U.S. adults perceiving e-cigarettes as more harmful than cigarettes increased substantially between 2012 and 2022, particularly following major public health events and anti-vaping campaigns (33). These changing perceptions may influence how pregnant individuals interpret risk and respond to cessation messaging.

At the same time, vaping served both emotional and habitual functions, reinforcing its persistence. For pregnant participants, this emotional reliance often existed alongside heightened awareness of potential risks to the fetus, creating a conflict between immediate emotional regulation and long-term health goals. Consistent with prior qualitative research, participants described vaping as a key mechanism for managing stress and emotional distress (34). In this study, vaping was also embedded within daily routines, sensory experiences, and relational contexts, which further reinforced its persistence. Interpreted through the health belief model, stress may act as a perceived barrier that shapes how individuals interpret risk and engage in cessation. Experimental evidence suggests that higher stress levels are associated with reduced perceived harm and lower intentions to abstain from vaping (35). In this context, emotional reliance on vaping may attenuate the effectiveness of risk-based messaging, particularly when individuals experience competing physiological and psychological demands during pregnancy.

Social and institutional contexts further shaped cessation experiences. Social environments functioned as both barriers and facilitators, with normalization and accessibility reinforcing use, while supportive relationships encouraged quitting. These findings align with prior research demonstrating the influence of social norms and peer dynamics on vaping behavior (34). Within pregnancy, however, participants often navigated these influences while simultaneously managing expectations regarding maternal behavior and responsibility. Participants also described actively restructuring their social environments, including setting boundaries and distancing themselves from relationships associated with vaping, which in some cases resulted in social loss. At the institutional level, trusted relationships with CHWs facilitated engagement, whereas perceived stigma, fear of consequences, and inconsistent provider guidance discouraged disclosure and help-seeking. Participants further described navigating these institutional systems selectively, weighing the benefits of support against perceived risks of disclosure. Although Bowker and colleagues identify social stigma surrounding e-cigarette use during pregnancy in public settings, the present findings suggest that stigma may also influence pregnant individuals' willingness to disclose vaping behaviors and seek support from healthcare providers and institutional systems (36). Similar challenges have been documented in prenatal care settings, where gaps in provider knowledge and inconsistent counseling practices limit effective communication about e-cigarette use (17, 31). These barriers may have broader implications for Medicaid-enrolled populations, who experience disproportionately high rates of tobacco and nicotine use. Recent national estimates indicate that only approximately one in ten adult Medicaid enrollees with daily tobacco or nicotine use receive cessation medications despite the substantial burden of tobacco- and nicotine-related disease within Medicaid populations (37). While concerns regarding stigma and disclosure are common across substance use and cessation contexts, participants frequently framed these concerns around pregnancy-specific fears, including judgment about maternal behavior and potential consequences for themselves and their children. These findings demonstrate the importance of recognizing that access to cessation resources alone may be insufficient when concerns related to stigma, trust, communication, and engagement remain unresolved. Altogether, these observations suggest that cessation was facilitated by supportive relationships, trusted sources of guidance, and accessible support services, whereas normalization of vaping, stigma-related concerns, and inconsistent provider communication often hindered quitting efforts.

Across themes, participants experienced persistent ambivalence and a nonlinear quitting process, reflecting ongoing tension between perceived harms and perceived benefits. This ambivalence was not isolated but emerged across emotional, social, and institutional contexts, shaping how participants navigated cessation over time. Similar patterns have been observed in prior research describing how competing motivations sustain vaping behavior despite awareness of risk (34). Participants also described justifying continued use in certain contexts, such as framing vaping as less harmful or necessary for short-term emotional relief, highlighting how ambivalence was actively negotiated (36). Quitting was also iterative, characterized by repeated attempts, relapse, and fluctuating confidence, consistent with established models of cessation as a cyclical process rather than a single decision (34, 38).

For some participants, cross-substance dynamics further complicated cessation, suggesting that vaping is embedded within broader patterns of substance use. This aligns with evidence demonstrating strong associations between alcohol use and multiple forms of nicotine use among reproductive-age females, with pregnancy amplifying these relationships (39). In addition, a randomized trial comparing e-cigarettes with nicotine replacement therapy during pregnancy reported anecdotal evidence from participant follow-up calls suggesting that media coverage surrounding the 2019 e-cigarette or vaping product use-associated lung injury (EVALI) outbreak prompted some pregnant participants to stop vaping and return to cigarette smoking (40). In those contexts, cross-substance use may function as an adaptive strategy in response to stress, uncertainty, and situational demands, even as it complicates cessation efforts. Together, these findings underscore the need for flexible, patient-centered interventions that address emotional regulation, support identity transitions during pregnancy, and prioritize trust-building within social and healthcare contexts.

4.1 Implications for Practice and Research

Several implications for vaping cessation support among pregnant individuals are highlighted. First, pregnancy-centered approaches that support identity transformation may strengthen cessation, as motivations tied to maternal roles were not always fully internalized. Second, interventions should move beyond risk-based messaging to address the emotional and habitual functions of vaping by incorporating stress management and alternative coping strategies. Third, addressing social environments is critical; interventions should support boundary-setting and reduce exposure to vaping within social networks, with consideration for involving close support people.

The importance of trusted, nonjudgmental support highlighted the importance of relational care within prenatal and cessation settings. Participants in this study described valuing supportive interactions that emphasized empathy, encouragement, and individualized communication throughout the quitting process. Prior research has similarly shown that community-based perinatal support providers, including CHWs, may help foster trust, emotional support, and engagement with prenatal care services among pregnant individuals (41, 42). These findings suggest that vaping cessation support during pregnancy may benefit from stigma-free, relationship-centered approaches that acknowledge the emotional and social complexities of quitting. Given the presence of ambivalence, nonlinear quitting, and cross-substance dynamics, cessation should be approached as an ongoing and adaptive process rather than an immediate outcome.

Future research should examine pregnancy-specific influences on vaping cessation, including how withdrawal is interpreted alongside pregnancy symptoms, and evaluate CHW-led and identity-based interventions tailored to vaping. Studies involving more diverse populations and settings are needed to improve transferability and inform scalable, pregnancy-centered approaches.

4.2 Strengths and Limitations

This study employed reflexive thematic analysis to support in-depth exploration of patterns in vaping cessation experiences within a maternal health context. The use of iterative coding, reflexive memos, and reflexive discussions with the research team further strengthened analytic rigor.

Several limitations should be considered. The study was conducted within a single community-based cessation program, which may limit transferability to other settings or populations. Additionally, eligibility was limited to participants who completed the Smoke-Free HOPE program, which may have excluded the perspectives of individuals who discontinued participation or disengaged from cessation support. As a result, the findings may disproportionately reflect the experiences of participants who were more engaged with the program. Findings were also based on self-reported experiences and may be influenced by recall or social desirability bias. Furthermore, the context-specific sample reflects the scope of the program and may not capture the full range of experiences among pregnant individuals who vape. Despite these limitations, the qualitative design allowed for rich, contextual insights that contribute meaningfully to understanding vaping cessation during pregnancy.

5. Conclusion

Vaping cessation during pregnancy is shaped by complex individual, relational, and structural factors. By centering the experiences of pregnant women, this study offers practice-relevant insights to inform the development of pregnancy-centered vaping cessation interventions. Additional research is needed to refine and evaluate supportive approaches that address both behavioral and contextual dimensions of vaping during pregnancy.

Abbreviations

CHW – Community Health Worker

HBM – Health Belief Model

KI – Key Informant

SCT – Social Cognitive Theory

Declarations

Ethics Approval and Consent to Participate

This study was approved by the Loma Linda University Institutional Review Board (IRB # 5220112). All participants provided informed consent prior to participation in the study. For focus groups conducted via Zoom, participants provided electronic consent and agreed to audio and video recording. All procedures were conducted in accordance with relevant ethical guidelines and regulations. Analysis of existing interview transcripts was conducted under the same IRB approval.

Consent for publication

Not applicable.

Availability of Data and Materials

Not applicable.

Competing Interests

Not applicable

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Author's Contributions

J.L. wrote the main manuscript text and created Table 1, Supplementary Table S1, and Supplementary S2. All authors reviewed this manuscript.

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Author's Information

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