Exploring Physician Attitudes Regarding Electronic Documentation of E-cigarette Use: A Qualitative Study

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Tobacco Use Insights
Volume 11: 1–7

DOI: 10.1177/1179173X18782879
SAGE

ABSTRACT

BACKGROUND: In this article, we present qualitative work designed to explore physicians' attitudes toward and knowledge of electronic cigarettes (or Electronic Nicotine Delivery Systems—ENDS), particularly focusing on personal attitudes held by physicians regarding ENDS use, physician beliefs regarding the relative safety of ENDS, attitudes regarding the efficacy of ENDS as a smoking cessation tool, and how physicians' document ENDS use in the electronic health record (EHR).

METHODS: We completed a total of 17 semistructured qualitative interviews with physicians in 4 different outpatient clinic locations. Clinics were selected with the goal of reaching patient panels across a diversity of socioeconomic and local geographic locations.

RESULTS: The findings from our qualitative analysis suggest that physicians feel uninformed about the long-term health risks of ENDS and believe that they lack the critical medical knowledge required for discussing ENDS with their patients who smoke. Although physician responses did not endorse the view that ENDS use is a safer alternative to combustible tobacco use, approximately one-third of our physician sample did not hold strong objections to ENDS usage. Physicians placed varying degrees of importance on the issue of ENDS documentation practices.

DISCUSSION: Three overarching themes were revealed from our analysis. These themes included (1) physicians' attitudes regarding the use of ENDS for smoking cessation, (2) physicians' guidance and advisement to patients in the use of ENDS for smoking cessation, and (3) current practices of clinical documentation of ENDS use in an EHR. Our qualitative results indicate that physicians in our study rarely screen patients for ENDS use, even for those patients who are both documented smokers and recipients of physician-led tobacco cessation counseling. However, most physicians agreed that the prospect of creating a structured data field specifically for the documentation of ENDS use within the EHR would result in the likelihood of increased screening and documentation of ENDS use patterns.

KEYWORDS: Electronic Nicotine Delivery Systems, electronic cigarettes, e-cigarettes, smoking cessation, electronic health records

RECEIVED: December 21, 2017. **ACCEPTED:** May 16, 2018.

TYPE: Original Research

FUNDING: The author(s) received no financial support for the research, authorship, and/or publication of this article.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Introduction

Since their introduction, e-cigarettes (Electronic Nicotine Delivery Systems—ENDS) have quickly grown to become a US $2.5 billion dollar industry.[1] In 2014, the proportion of the US adult population to have tried ENDS at least once was estimated to be 12.6%, with 3.6% of adults currently using the products.[2] This growth in ENDS users has occurred in the context of a general reduction in the proportion of current, daily smokers of combustible cigarettes in the US population; 15.1% of adults were current daily smokers in 2015, compared with 20.9% in 2005.[3]

At present, there is no clear international consensus on the appropriate regulation of ENDS, with jurisdictions adopting a range of regulatory responses to the product. For example, in the United Kingdom, it is possible to license ENDS as medicines,[4] whereas in Switzerland, the sale of nicotine-containing ENDS is prohibited.[5] In the US context, prior to 2016, there was no federal (ie, national) regulation regarding the sale or use of ENDS. This situation changed in August 2016, when the Food and Drug Administration "deemed" that ENDS should be regulated as tobacco products, with new restrictions including a ban on under-18s purchasing ENDS, and the inclusion of mandatory warning labels on ENDS products.[6] This heterogeneous international regulatory response reflects the lack of consensus among regulators, medical associations, and health professionals on whether ENDS represent an exciting new smoking cessation opportunity[7–10] or are an untested, potential unsafe technology that risks undermining existing public health successes in "denormalizing" smoking.[11–14]

Given the absence of FDA regulatory recommendations and the existence of inconsistent professional health organizations' guidelines for ENDS use, medical professionals are left to develop their own empirical and clinical perspectives to inform and manage patients who use ENDS. Several different types of studies exist to explore the question of how patients are currently advised on this topic. These studies have involved e-mail and online surveys with patients and quit line staff[15]; an analysis of free-text tobacco use comments in electronic health record (EHR) documentation[16,17]; and

qualitative and survey-based research focusing on physicians' views of ENDS products.[18,19]

Kandra et al[18] investigated a diverse sample of 122 physician specialists, all treating tobacco-related disease in North Carolina. Recruitment strategies made use of e-mail canvassing and a series of close-ended survey questions. The researchers found that over half of the physicians in the sample (67.2%) believed that ENDS are helpful for smoking cessation and only slightly less (64.8%) thought that ENDS lower the risk of cancer for patients who use them instead of traditional cigarettes. Indeed, 35% of the physicians recommended ENDS, especially if individual patients asked about them. Similarly, Steinberg et al[15] made use of an e-mailed link to a Web-based survey to enroll 150 physician specialists and ask about physician-patient communication regarding ENDS. Slightly more than one-third (36%) of the physicians endorsed a harm-reduction approach when justifying ENDS use, and consistent with previous results,[17] 30% of the physicians recommended ENDS in lieu of combustible cigarettes.

Cummins et al[20] surveyed 418 quit line counselors in the United States and Canada about counselors' perceptions of ENDS and what information they typically share with callers regarding the safety and use guidelines for these products. Nearly 70% of counselors regarded ENDS as ineffective quitting aids. In addition, most believed that ENDS are addictive (87%), and a similar majority considered secondhand vapor exposure to be harmful (71%). Although counselors acknowledged receiving calls explicitly related to ENDS use, very few counselors recommended ENDS use (4%). Drouin et al[21] examined patient reported survey data from across the United States to explore the content of advice patients received from their doctors, dentists, or children's doctor about the benefits and harms of ENDS. Of the adults in the survey who had visited their clinicians in the last year, 7.3%, 1.7%, and 10.1%, respectively, reported discussing the potential harms of ENDS. In contrast, 5.8%, 1.7%, and 9.3% described receiving information about the benefits of ENDS use. Of the 3 types of clinicians, dentists offered their patients the least guidance. All 4 studies seem to suggest that in some cases the overall clinical perception of "all tobacco is bad" or "all nicotine is bad" has shifted to a broader "harm-reduction" approach, despite the gaps in scientific knowledge or recommendation by the FDA.

Mowery et al[17] analyzed Veterans Administration (VA) patient record data (2008-2014) to examine the frequency of ENDS use documentation in the VA EHR. A cohort of 2000 patients who were recorded as smokers in the VA EHR were identified using keyword searches for ENDS-related terms—eg, *vape, ecig, e-cig*—that matched actual instances of ENDS use notation, discovering that ENDS-related keywords were present in 4% of patient records.

An earlier study in by Winden et al[16] also made use of EHRs, examining EHR progress notes to understand how ENDS use is being documented and the associated implications of this screening data for clinical research. Specifically, a content analysis was performed on 500 randomly selected notes containing ENDS-related terms drawn from a 5-year period, with the researchers discovering that 74.6% of notes indicated current use of ENDS. Slightly more than half of the notes (52.4%) cited details about concurrent ENDS and tobacco use.

El-Shahawy et al[19] made use of qualitative methods to explore the topic of physician beliefs and physician-patient communication. A total of 15 internal and family medicine physicians were recruited from 2 practice settings in Virginia that included a large university health system and a non-university-based community practice setting. Semistructured, in-depth interviews were designed to elicit physicians' personal knowledge and clinical beliefs regarding ENDS use, screening and counseling practices involving ENDS, and specific contexts in which they might approve ENDS use for their patients who smoke. Results from the study reveal that most physicians expressed the view that there is a lack of official information about the safety or efficacy of ENDS. Physicians frequently discussed ENDS with their patients who smoke and most believed that ENDS offered a safer approach when compared with combustible tobacco products. As in the previous qualitative studies mentioned, physicians in the El-Shahawy study adopted a patient-centered approach to the use of ENDS, often modifying their advice regarding ENDS in light of individual patient characteristic. The physicians were also less skeptical about the benefits and safety of ENDS particularly when patients were perceived as highly addicted or when extensive smoking-related comorbidities existed compared with other patients who were smokers.

The objective of the current qualitative study is 3-fold. First, we intend to explore physicians' attitudes toward and knowledge of ENDS; second, to understand physician beliefs regarding the relative safety of ENDS and its use as a smoking cessation tool; third, to learn how physicians document—or choose not to document—ENDS use in the EHR. The study reports on a sample of physicians from a Southern California Academic Health Center, thus enriching and complementing the spectrum of knowledge from different practice settings and patient smoking populations throughout the United States. A key feature of the current work that distinguishes it from previous qualitative and survey-based research is the emphasis on investigating physicians' ENDS documentation practices.

Methods

Recruitment

A total of 17 family medicine physicians employed by a large academic health center in Southern California, with outpatient community satellite clinics, participated in this study. Enrollment information about the study was presented during 2 monthly division meetings, and details for participation were

Table 1. Interview guide.

1. What is the current number of professional years of experience you have as a licensed physician?
2. Have you ever participated in a professional certified medical training for smoking cessation education for patients?
3. Were you ever a cigarette smoker? Have you ever used an ENDS?
4. How would you describe the general demographics of your current patient panel?
5. What is your perspective on the use of ENDS as a tool for patient smoking cessation? Have you ever suggested the use of ENDS for patients who are trying to change or quit their smoking habits?
6. Describe how you might typically counsel patients about ENDS use?
7. What reasons are reported by your patients for initiating ENDS use and frequency of use?
8. How commonly or regularly do you record or note ENDS use in the patient chart? Why do you believe this notation is important or not important to add in the patient notes?
9. What is your attitude toward the regulation of ENDS? What has caused you to develop this opinion?

outlined for the group by lead medical faculty. To be eligible for participation, physicians were required to be actively providing outpatient health care to adult patients and specifically to have discussed tobacco cessation and the potential use of ENDS with at least one of their patients within the last 6 months. This time frame was selected to ensure that physicians would have accessible and accurate recollection of a patient encounter. Using a purposeful sampling approach, we recruited from different community practice settings within the health care system to reach physicians with patient panels across a diversity of socioeconomic and geographic locations in the county. All physicians who matched both the study criteria and were interested in volunteering for the study were invited to contact the first author (SH) to schedule a time to be interviewed. All interviews were conducted in-person at the office of each physician, scheduled either at the start or end of their working day. All procedures for the qualitative data collection and analysis were reviewed and approved by a university Institutional Review Board, with informed consent secured from every physician prior to the interview process. Physicians who completed the interviews received a US $40 gift card for their participation.

Qualitative interviews

Qualitative interviews were conducted between April and October 2016. A total of 17 physician interviews were completed in 4 different outpatient clinic locations. The interview guide was designed in a semistructured open-ended format[22,23] to support the opportunity for exploring different physician viewpoints on the use of ENDS for smoking cessation and their personal experiences in discussing ENDS with patients. The average interview lasted approximately 45 minutes including time for the consenting process. The interview guide (Table 1) posed basic demographic questions about each physician (ie, professional years of experience and training in smoking cessation patient education), as well as inquiries about (1) physicians' perspectives on the use of ENDS as a tool for patient smoking cessation, (2) physicians' attitudes toward the regulation of ENDS, (3) the manner in which physician's typically counsel patients about ENDS use, (4) reasons reported by patients for initiating ENDS and frequency of use, and (5) regularity of recording or noting ENDS use in the patient chart. The nature of these qualitative questions differs from other prior research as they focus not only on the advice given to patients but also on physicians' attitudes and practices in documenting ENDS use.

All interviews were digitally audio-taped and professionally transcribed by a university –vested transcription service in preparation for later content analysis. Transcripts were completed in a Health Insurance Portability and Accountability Act (HIPAA) compliant manner by redacting all identifying information, including names and community outpatient clinic settings. Data analysis was performed using only the redacted transcripts.

Data analysis

The constant comparison method framework[24–26] formed the core of our analytical procedure for comparative review of participant responses. A qualitative research expert began the initial cycle of open coding, making use of the preexisting theoretical focus within the interview guide to identify contextualized segments of data that correspond to targeted questions.[27] If data could not be assigned using the question-based coding schema, additional novel coding stems were added and in some cases resulted in expanding a subcategory of an already existing exemplar.[28] A second and third cycle of coding was performed using a team-based approach to resolve any disagreements in assignment or description of codes by discussion and consensus among members of the research team.[29] Interview transcripts were uploaded along with the codebook,

to a web-based qualitative analysis program Dedoose (version 6.1.18)[30] to complete the final excerpting of key phrases and statements relating to the responses of the original interview guide. Coded excerpts were merged into comparative nested categories based on conceptual similarity or redundancy, whereas in other examples, excerpted texts were dropped from the schema because of lack of utility to the specific aims of the study.

Results

A total of 17 physician interviews were conducted with participants averaging from 1 to 42 years of service as a licensed physician, with 10 years being the most frequently reported number of years of service as a physician. Three of our providers had smoked at least one combustible cigarette during their college years, and none of the physicians had ever used ENDS.

The results from the qualitative analysis merged into 3 general areas representing (1) physicians' attitudes regarding the use of ENDS for smoking cessation, (2) physicians' guidance and advisement to patients in the use of ENDS for smoking cessation, and (3) current practices in the clinical documentation of ENDS use in the EHR. Each theme is described with supporting quotations that were selected as representative of one or several participants. Quotations are verbatim unless indicated by an ellipsis (…) to signal that small segments of text have been removed for the sake of linguistic clarity.

Physicians' attitudes on the use of ENDS for smoking cessation

The use of ENDS for treatment in smoking cessation was generally viewed unfavorably by most physicians in the study. Specifically, a number of physicians expressed significant uncertainty on how best to advise patients regarding ENDS use. Several reasons were stated for their apprehensions, which included a lack of FDA approval for the products, lack of standardization in the manufacturing of ENDS, and unknown safety implications of use. Given this scarcity of knowledge and lack of evidence-based data, physicians felt pressed and uninformed, particularly about the long-term health effects of ENDS products. Many physicians described their current practical knowledge about ENDS as derived from either the mass media or anecdotal accounts given by patients.

Because of this uncertainty of knowledge, every physician expressed an urgent need for scientific evidence-based research to aid with advising smokers enquiring about ENDS during clinical visits. Many were also concerned and confused by the conflicting information generated by public health bodies in the United Kingdom versus the United States.[8] Many physicians raised doubts about the purity of additives contained in ENDS and others felt that ENDS may pose an imminent threat for both those who are inhaling and those exposed to secondhand vapor. Several physicians mentioned "these chemicals are unregulated and largely unknown in their quantities and mixtures and some have suggested that formaldehyde may be present as a preservative." Other examples of physician concerns included lack of regulation of chemical and nicotine contents, differences between brands of ENDS, apparent lack of standardization in the mixing of chemicals, and easy access to the product given the increasing number of vaping shops. One physician adamantly stated, "whatever they are inhaling instead of a cigarette is more carcinogenic, and that plays a big role in whether I can recommend or not."

Approximately one-third of the physicians admitted that they were originally open-minded and initially enthusiastic about using ENDS to assist patients to quit smoking. Some physicians anticipated ENDS would become a great tool for longtime smokers because it caters to a similar "oral fixation and gives patients a comparable pharyngeal kick that an inhalation of cigarette smoke provides." Several physicians reported that they initially welcomed ENDS as an alternative to tobacco. But most questioned whether or the chemicals that are being inhaled from ENDS are any better for their patients than smoking a combustible cigarette, given that ENDS generally contain nicotine and other chemical substances.

Physicians also unanimously expressed apprehensions regarding adolescents and teens who they believe are in fact the actual target of ENDS manufacturing and marketing. Nearly all of the physicians maintain several younger teenage patients on their medical panel, and expressed concerns about the flavorings, and enticing appearance of ENDS, and warned that ENDS could easily become a gateway drug for youth. Other physicians expressed concern regarding the long-term effects of vapor, as a potential toxic fume and thus a hazard to the environment.

Physicians' guidance and advisement to patients in the use of ENDS for smoking cessation

Nearly all the physicians in our study reported that they rarely screen for the use of ENDS, even with documented smokers they are counseling on tobacco cessation. For example, several physicians reiterated the sentiment, "I do not believe electronic cigarettes are a viable way to stop smoking" and "I wouldn't recommend them even for a patient who is highly motivated to quit." When asked specifically for their rationale, many physicians explained that rather than using ENDS, patients are better served by setting a quit date. Many physicians also believed that ENDS use would not necessarily decrease either the volume or frequency of combustible cigarettes smoked. Medical counseling most often took the form of encouraging patients to carefully weigh the risks and benefits of ENDS use and determining whether the product is an appropriate choice for their needs. One physician revealed, "I never advocate for e-cigarettes for my patients who want to quit smoking. I try to tell them the pros and cons . . . I'm kind of on the fence about this and I worry about the nicotine." Another physician explained, "My original outlook was that patients who are smoking e-cigarettes were

decreasing the amount of smoking they were doing. But I found over time they weren't actually quitting."

Those physicians who stated that they had participated in occasional counseling with patients about ENDS reported that nearly all of their patients had independently experimented with different ENDS products before consulting with them for medical approval. Furthermore, physicians related that many patients who reported ENDS use were continuing to smoke combustible cigarettes (although in some cases reducing the number) and expressed reluctance to halt this dual use. Indeed, many of our physicians' anecdotes described discussions in which patients who are active ENDS users do not view the product as a cessation tool but rather as a safer means of continuing nicotine consumption "because they appear safer due to the nonissue of combustion and burning of leaves." Although many patients see ENDS as nothing more than harmless flavored water vapor, several patients relayed to their physician that they believe ENDS to be the lesser of 2 evils (ie, a much safer alternative compared with other tobacco products).

Current practices of clinical documentation of ENDS use in an EHR

Most physicians we interviewed agree that it would be useful to develop a systematic screening framework for documenting ENDS use in an EHR. Given existing tobacco-based screening protocols, which do not include a standardized probe for ENDS, all physicians supported the need to develop standardized EHR-based screening practices for ENDS use.

When asked about their personal approaches to recording ENDS use in the EHR, physicians endorsed the view that assessing ENDS documentation was important. "I feel like that's normal health information that just should be part of the medical record," said one physician, "this is something I would want to talk to the patient about including what other medications he is taking so that I can follow up for any possible side effects." Several physicians described procedures for tracking patterns of ENDS use such as "placing notations in the social history and progress notes section . . . this is where I go to keep track of smoking history, where I typically record notes that can be monitored between visits." Another physician explained,

> I struggle with not knowing what to put for their smoking status. I still end up putting current smoker only because I want it to flag me about some kind of nicotine exposure and then I also make a comment about ENDS in my notes.

Other physicians spoke of monitoring ENDS smokers by highlighting a chart indicator for "counseling given—ready quit" to alert the physician to ask about ENDS use every time the patient comes in for a clinical visit. Similarly, several physicians explained that when a patient is in the hospital, often the nurses and medical assistants do the intake and information is recorded on a patient's problem list. "So even if I didn't do the initial screening," said one physician, ". . . the information will still be flagged for me to take notice and to discuss with the patient in greater detail at the time that we meet." In contrast, one physician expressed apprehension about documenting ENDS in a formal manner within the EHR. "I'm concerned this could potentially create a disadvantage for patients particularly if their medical record follows them to different locations and potentially penalizes their life insurance because they are labeled a smoker."

Many physicians felt that without an explicit, official recommendation that ENDS use should be documented in the EHR; the likelihood that systematic ENDS documentation would be adopted by physicians is limited. "Right now, I probably would—I would sit this on the sideline and wait to see which way the evidence falls, and/or the regulatory agencies fall, and then kind of let my practice flow from there," said one physician. Another physician explained this decision not to document ENDS use by stating: "I will not be planning to do anything until guidelines or regulatory agencies enforce policies to do so."

One physician stated that unless he engaged in what was considered "extensive discussion" with a patient about smoking, it is unlikely he would even think to probe about ENDS use and would not feel compelled to make any notations in the patient's EHR chart. A second physician reported that

> It isn't common for me to pursue smoking history with younger adults outside of asking them about the use of cigarettes, alcohol and drugs. It's not like they're coming to me for cessation. If they say no to cigarettes, I do not delve beyond into ENDS or vaping.

A third physician justified his position by stating

> I think asking about tobacco and e-cigarette use and then documentation in the EHR is very important no matter the age of my patient . . . with all patients it would be important to do, just as asking more about marijuana is now more prevalent because it's been playing a bigger role now and kids especially are getting savvy about smoking it from an electronic device.

Discussion and Conclusion

The research presented in this article has several limitations. First, physician participants were recruited from a Southern California academic medical center and hence are not representative of the overall physician population. Second, our interviews were both limited in time to around 45 minutes and constrained by an interview guide; hence, there was little opportunity for the serendipitous discovery of new knowledge that may have been possible in longer interviews.

Within the context of our interview guide, 3 general areas of discussion emerged from the participants in our current study capturing (1) physicians' attitudes toward the use of ENDS for smoking cessation, (2) physicians' guidance and advisement to patients in the use of ENDS for smoking cessation, and (3) current practices of clinical documentation of ENDS use in the

EHR. Similar to the results found by El-Shahawy et al[19] described above, our findings also conclude that physicians feel generally uninformed and believe that they lack critical medical knowledge for discussing ENDS use with their patients who smoke. Still, approximately one-third of our physicians do not hold strong objections to ENDS use, a result consistent with previous studies.[17,19] Many of our physicians did, however, express concerns regarding patients who do not readily disclose ENDS use or initiate ENDS use without medical approval.

None of our findings suggest that physicians view ENDS use as a safer alternative to smoking, nor did any of the physicians advocate that switching from traditional tobacco products to ENDS could help a patient quit or reduce addiction. This sentiment was also echoed in Cummins et al[20] where 70% of quit line counselors regarded ENDS as an ineffective cessation tool and quite likely addictive. Several physicians in our study described anecdotal accounts of patients who after reporting ENDS use continued to also smoke cigarettes even after advisement that dual use of combustible cigarettes and ENDS could be damaging to health over time. In contrast, Kandra et al[18] and Steinberg et al[15] reported that some physicians felt justified endorsing the use of ENDS over traditional tobacco citing the harm-reduction approach in defense of the recommendation. In comparison, nearly all the physicians in our study reported that they rarely screen for the use of ENDS even with known smokers they are counseling on tobacco cessation.

Given both the overall lack of scientific knowledge regarding ENDS and the highly variable way in which physicians reported screening and documenting ENDS use, the prospect of creating a formal intake area in the EHR was viewed positively by participants. Many physicians suggested that a specific area or "box" for reporting during a routine examine would assist physicians in performing a uniform and systematic approach to screening for ENDS, along with other tobacco products and substances. Other physicians offered approaches to documenting ENDS use that included using the social history and progress note section, to support continuity of care. Even though most of our study physicians endorsed the need for ENDS-related EHR documentation, a few strongly resisted, preferring to wait until regulatory agencies provide evidence and enforce policies on ENDS manufacturing and processing. Most physicians, however, asserted that without documenting ENDS use in the EHR, current estimates regarding the prevalence of ENDS use could seriously underestimate the popularity of product use, with the risk that evidence-based policy regarding the health and safety risks associated with ENDS use will be even further delayed.

Author Contributions

MC and SH contributed to conceptualization; investigation; writing, review and editing of the study; and writing of original draft. SH contributed to data curation, formal analysis, and methodology. MC contributed to supervision and validation of the study.

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