

Inequalities, harm reduction and non-combustible nicotine products: a meta-ethnography of qualitative evidence

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Abstract

As a new 'disruptive' technology, electronic cigarettes have the potential to interact with socioeconomic differences in smoking attitudes and practices in ways that are distinct from more traditional cessation aids. We sought to review qualitative evidence on how smokers of low socioeconomic status engage with non-combustible nicotine products, including electronic cigarettes and nicotine replacement therapies, in order to provide insight into how these products might impact on smoking inequalities. The review found very few studies exploring the attitudes of disadvantaged smokers towards non-combustible nicotine products for harm reduction or cessation purposes. Using a lines-of-argument meta-ethnographic approach, our analysis suggests that, while nicotine replacement therapies and e-cigarettes are often used in harm reduction or cessation attempts, socio-economic disadvantage makes continued use difficult. This may be exacerbated by a lack of a perceived advantage of alternative products over smoking. Overall, our review highlights the importance of considering the social, cultural and economic circumstances that influence the experience and significance of smoking and the use of alternative products, particularly for smokers of low socio-economic status.

Background

The recent emergence of e-cigarettes in the nicotine market has rejuvenated debates on tobacco harm reduction and cessation. Some hail the devices as game changers in the struggle to reduce smoking prevalence [1], while others debate their ability to positively impact on existing smoking inequalities [2–5]. Meanwhile, quantitative data continues to demonstrate a concentration of smoking within socio-economically disadvantaged communities across Europe [6]. In order to explore the potential of e-cigarettes on reducing inequalities, this study seeks to review qualitative data on smokers' attitudes towards all non-combustible nicotine products (NCNP) to help understand how social context informs the significance of practices of use of alternative nicotine products.

In the context of tobacco control, 'harm reduction' refers to strategies that support reduced use of tobacco – ranging from stopping smoking to cutting down and temporary abstinence – with NCNP often being presented as aids to achieve such harm reduction [7]. There is evidence that those who use one such set of products – nicotine replacement therapies (NRT) – to reduce smoking are more likely to eventually quit than those who do not [8], lending support to harm reduction as a first step in ultimately quitting altogether. Historically, in the UK, only NRT – including gum, patches, lozenges, and inhalers – have been officially endorsed as aids to smoking reduction or quitting [7]; but more recently, a number of UK organisations have promoted e-cigarettes as harm reduction products [9–12]. While e-cigarettes are a relatively new technology, early evidence from the UK points to their use being associated with an increased number of quit attempts [13], leading some experts to postulate that increasing e-cigarette use in the population will eventually drive down smoking prevalence [14].

Additionally, some commentators working in public health have suggested that e-cigarettes have potential for addressing socioeconomic inequalities in smoking, noting their relative low-cost and wide availability [9, 15]. Yet there is no clear evidence to date to indicate that e-cigarettes will contribute to reducing inequalities in conventional tobacco use and some scholars have suggested they may actually exacerbate inequalities in smoking due to the higher cost of more sophisticated and advanced types which might limit their availability to low-income smokers [2, 5]. This has been supported by recent research that suggests the most effective e-cigarettes for cessation are the most expensive [16]. There are also fears that the tobacco industry may deliberately exploit this by promoting basic low-efficacy models [17]. Extensive evidence also suggests that socioeconomically disadvantaged smokers find it more difficult to quit smoking, even where motivation and support levels are comparable with advantaged smokers [18]. Cessation support with conventional NRT has lower efficacy among disadvantaged smokers [19, 20], and while there has been much research on the efficacy of NRT for smoking cessation, very few studies have examined its efficacy in isolation from other interventions or examined its impact among disadvantaged populations [21].

Qualitative research is crucial for understanding attitudes towards tobacco use, harm reduction and cessation. Disadvantaged circumstances often go hand-in-hand with increased smoking prevalence and more 'normalised' attitudes towards smoking [22, 23]. Circumstances of stress caused by social and economic disadvantage have been cited as reasons for smokers to continue smoking and to avoid, delay, or relapse from cessation attempts [24, 25]. Stead et al [26] and Thompson et al [27], have explored how place of residence can isolate disadvantaged communities from wider social norms, in which smoking is denormalised, creating smoking 'islands' within countries. Smoking in these communities often becomes connected to social and cultural identity and practices and, as Robinson and Holdsworth [28] find, smoking and cigarettes become shared practices and goods laden with emotional significance. A recent meta-ethnography exploring public understandings and experiences of health inequalities found that smoking was, like other unhealthy behaviours, consistently described by participants experiencing disadvantage as a mechanism for 'coping with' or momentarily forgetting difficult and stressful life circumstances [29]. The significance of smoking and attitudes to harm reduction among disadvantaged smokers are further reflected by Pateman et al [30] who found that disadvantaged smokers felt 'trapped' in smoking behaviours due to structural circumstances of disadvantage beyond their control, while at the same time feeling that smoking cessation was dependent on individual willpower.

Aims of review

Smoking prevalence is relatively high and cessation relatively low in disadvantaged groups within high-income countries [31]. Given that qualitative research has regularly demonstrated distinct differences in attitudes to smoking by socio-economic status (SES) and social class; this review explores perceptions and

uses of NCNPs among low SES groups and how these perceptions and uses map onto harm reduction strategies. We used a meta-ethnographic 'lines-of-argument' approach to synthesise qualitative studies identified from a larger systematic review of NCNP and use by SES in high-income countries with advanced tobacco control policies.

Methods

A full protocol of this review has been registered with PROSPERO (ID: CRD42017080672) [32]. This review is part of a larger project and the results of a quantitative literature review are reported in a separate paper.

Search Strategy

A search string that used terms for NCNP, socio-economic inequalities and combustible tobacco smoking (Supplementary File) was used to search the following 10 electronic databases on 9th February 2017: BIOSIS Citation Index, web of Science Core Collection, Cochrane Library, ProQuest Social Sciences premium collection, CINAHL Plus, EMBASE, Medline (+ Medline Epub ahead of print), PsycInfo, Global Health. An initial 24,711 studies were identified across all databases.

Study selection

Once duplicates had been removed, title and abstract screening identified studies from high-income countries with falling rates of tobacco smoking in the general population and those that had any of the NCNP as a main focus or intervention. Only studies from 1980 onwards were considered as this was considered a watershed date for high-income countries beginning to explore harm reduction [33–35]. Title and abstract screening was completed by ML and 206 studies were identified. From these a sample of 50 were screened independently by at least one other author. ML conducted the full-text review and regular meetings with all three authors were held to check samples of remaining papers and refine the inclusion and exclusion criteria. Ultimately, nine qualitative papers were identified for inclusion in the review (Figure 1). Three of these papers reported findings on NRT from the same, single study. As the three studies contained significant overlap and two had very limited evidence of use or perceptions of NRT, we elected to analyse them as a single study. We conducted further hand searching of reference lists of included studies but found no further articles to include.

Figure 1: PRISMA flow diagram

<Figure 1 to appear here>

Data Extraction and Quality Appraisal

A data extraction form was developed and piloted to extract the following information from studies: study design, location, participant characteristics, sample size, study period, type of NCNP and measure(s) of SES. Short textual entries were made to indicate the study's main findings for the review and what these results might suggest about equity outcomes. Data were extracted by ML and checked by the other authors. Criteria for critical appraisal were created based on the CASP guidelines for qualitative research [36]. Criteria covered the primary focus of the paper, appropriateness of study design, sample recruitment, methodology, analysis and generalizability. All papers were considered of adequate quality to be included in the review.

Data Analysis and Synthesis

Noblit and Hare [37] categorised three different types of meta-ethnography: lines-of-argument, reciprocal and refutational. We selected a lines-of-argument approach (in which studies are directly translated into one another), which enabled us to consider what we can say about the 'whole' based on selective studies of the 'parts'. We felt this approach was suitable given the similar number of studies identified for each NCNP type (although there were six studies of NRT, three of these draw from the same data-set and so are counted as a single 'study') [38–40]. In contrast, we felt that reciprocal analysis assumed too much similarity between NCNP, while a refutational analysis (which focuses on contradiction between studies) assumed too much difference. Nonetheless, there were some important contrasts within the studies and we consider these in the discussion section. We discerned our lines-of-argument from recurring themes across the studies that indicated barriers or facilitators to NCNP uptake and perceptions of NCNP in relation to harm reduction.

The synthesis was completed in five stages (Table 1). In the first stage all papers were read by all three authors. In the second stage we categorised the included studies by NCNP type (e.g. NRT, e-cigarettes), following a similar approach of separating distinct product categories for analysis in a meta-ethnography of taking medicine for asthma [41]. This enabled us to examine the differences in findings between NCNPs, which we felt was important given they involve different products, forms of use and availability. Once categorised into sub-groups, the findings/results sections of each study were coded line-by-line. First order codes of participants' accounts and second order codes of authors' interpretation were coded separately in NVivo 10. We took first order data to refer to participants' own words (quotes) or direct descriptive summaries of participants' own words by authors. We took second order data to refer to interpretations and summaries by authors of participant perceptions and attitudes. In the third stage, meta-themes were created by 'translating' codes for both the first order and second order across the grouped studies. In most cases the second and first order translations reflected each other, providing assurance that we had interpreted the data in a similar way as the authors (Supplementary File). In the fourth stage, further translation of codes was derived from the meta-themes through an application of our study aims to create lines-of-argument – which summarised reasons why people would use NCNP, would not use NCNP and how they saw NCNP as part of harm reduction strategies. In the fifth and final stage, we translated the findings across NCNP type to create a final lines-of-argument synthesis.

Results

Study summary

There were nine included studies, three of which focused on e-cigarettes (Table 2) and six on NRT (Table 3). We did not identify any qualitative studies of smokeless tobacco use that had a focus on distinct SES categories. Almost all these studies came from the UK, with just one study (reported in three articles) from elsewhere (Australia). The relatively small number of included studies was surprising, due to the large field of qualitative literature on smoking and disadvantaged communities [22, 42]. Many studies identified in the original search were not included on the basis that they did not contain references to NCNP or were focussed on some other aspect of disadvantage that was not SES. The small sub-set of studies highlights the lack of direct and sustained engagement with low SES groups and NCNP.

The NRT and e-cigarette studies were coded independently of each other given the difference in the length of time these products have been available and their different modes of use. The ultimate lines-of-argument for each NCNP were relatively similar with many themes occurring in both strands of analyses and being straightforwardly translated into each other. For this reason we have largely considered NRT and e-cigarettes together when the lines-of-argument for each NCNP were similar. We categorised our final identified lines-of-argument into three overall views on the prospects of NCNP for harm reduction: 'pessimistic', 'optimistic' and 'uncertain' (Table 4). Full details of the coding process can be found in the Supplementary File. Pessimistic results, which reflected a general lack of enthusiasm or perceived ability to use NCNP to replace smoking were the most common results and so are discussed first. Optimistic findings and 'uncertain' findings which reflected uncertainty and indecision, especially in terms of NCNP potential for harm reduction or cessation were less common. However, there were significantly more optimistic findings relating to e-cigarettes which appeared to reflect different modes of use and understandings of relative harm. As the most common, the pessimistic views are presented first, followed by the optimistic and finally the uncertain.

Pessimistic views

Social, cultural and economic circumstances of low SES smokers not conducive to NCNP uptake. Social and cultural circumstances in which smoking was perceived as a normal, inevitable and even necessary part of everyday life were a feature of most studies. Stress was commonly mentioned as a reason for postponing cessation or reduction plans, and participants indicated the feeling that continued smoking was almost inevitable:

Because [...] there's a wee bit too much stress in my life at the moment that I had to go back on the cigarettes. (Female, 47, smoker) (Rooke et al: e63 [43])

I gave it away and then 7th of July last year, went off for four months and then me nerves played up on me so I went back on. (Male, smoker) (Bryant et al: 4 [40])

Female participants frequently described prioritising family caretaking over their own wellbeing, leaving little time for self-care such as smoking reduction. Additionally, Thirlway (2016) noted that e-cigarette use in a working class area in north-east England appeared to be dominated by young men who were attracted to the novelty and gadgetry of the devices. She found young women reluctant to visit specialist 'vape' shops where men seemed to congregate.

The idea of a working class hedonism was also evident throughout Thirlway's [23] study, e.g. "them at Greendale [middle class area] haven't enjoyed themselves the way us lot have – I've no regrets" (p. 110, male, 47, smoker). Thirlway observes that other young men in her study felt vaping did not fit with a 'hedonistic' masculinity that valued carefree consumption. Hence, there were variations in local responses to, and views of, e-cigarettes both between men and women and among men.

Both Atkinson et al [44] and Wiltshire et al [45] noted that participants rarely encountered situations of enforced temporary abstinence at home or work due to unemployment. For example a male (smoker) participant in Wiltshire et al said of him and his partner: "[We're] not comfortable living here... I'm unemployed... Stress levels have been very high [and] we have noticed we smoke a lot more" (p. 299). Atkinson et al and Wiltshire et al both suggest that encountering such restrictions is more common for more affluent individuals in higher grades of employment, and for whom smoking reduction and cessation then becomes expected and normalised.

The perceived high price of NCNP, along with a concern about not getting value for money if they turned out not to help smoking cessation or reduction, recurred throughout most of the studies. Financial concerns were particularly highlighted by participants in Thirlway's [23] study:

Although £10 would buy a starter tank and e-liquid, smokers like Martin could get a week's worth of illicit rolling tobacco for the same money and could not risk such a large outlay on something that might not 'work' for him (p. 108).

Furthermore, Thirlway noted that people were likely to revert to cigarettes when their e-cigarette broke, rather than seek a replacement. Similarly, Wiltshire et al [45] and Roddy et al [46] found that cigarettes were easily obtainable through informal networks when money was tight, suggesting that the financial disincentive to smoke was not as great as might be expected in a context of high tobacco taxation.

NCNP do not carry enough 'relative advantage' over smoking or other harm reduction products. When discussing NRT, many of the participants explained that NRT had an unpleasant taste, or was not felt to work as intended. Additionally, some participants enjoyed smoking and were unconcerned about continued smoking.

I know it's bad for me and everything like that, but I do enjoy it. (Female, smoker) (Wiltshire et al: 297 [45])[45]

I just like fags. I just like the taste of fag. (Male, 20, smoker) (Rooke et al: 063 [43])

While NRT represented a complete break from smoking actions that did not fit in with a stress relief ritual, e-cigarettes were sometimes experienced as more unsettling due to their similarity to smoking. Participants noted that switching to an e-cigarette did not feel like quitting and that the similarities could potentially lead to continued nicotine addiction or relapse in smoking:

I don't feel like I've stopped smoking, I just feel like I smoke them instead. (Female, 47, ex-smoker) (Rooke et al: e63 [43])

It's not getting rid of the habit. [...] I'm still trying to persuade my husband to go on [nicotine replacement] patches, because I'm like, honestly, you've got to stop with that part of it [simulating smoking action]. (Female, 40, smoker) (Rowa-Dewar et al: 18 [47])

Likewise, Thirlway [23] found that some people regarded addiction as the primary 'deviance' and reflected that e-cigarettes did little to improve this given the continuation of nicotine use.

Lack of clear information about relative harm of NCNP. Finally, many of the studies reported uncertainty about the relative harms of NCNP, often centring on the continuation of nicotine consumption and becoming addicted to something new.

I kind of understand it [NRT] ... but then on the other side of it I think because it's nicotine replacement so how is it gonna help you stop if it's still giving you the nicotine. (Female, 25-34, smoker) (Atkinson et al 2013: 4 [44])

Studies of e-cigarettes also found some participants to be unsure about the health risks of e-cigarettes.:

I don't trust the electronic cigarettes, I just...I don't think there's been enough research on them. (Male, 39, smoker) (Rowa-Dewar et al: 17 [47])

Some of the participants in Rooke et al [43] were particularly distrustful of e-cigarettes that were not sold through official retailers such as *Boots*, citing unknown and possibly dangerous ingredients. Atkinson et al suggested that the negative effects of environmental tobacco smoke had come to be underestimated due to a lack of knowledge, and contributed to lack of uptake of NRT in the homes of those smokers with children.

Optimistic views

Despite a general lack of enthusiasm for all forms of NCNP across the nine studies, there were more positive attitudes to e-cigarettes, captured particularly through the ethnographic encounters in Thirlway's study [23]. In contrast to e-cigarettes not fitting with a 'hedonistic' identity, their novelty technology could be an attractive point for some young men who used the devices to develop a 'vaper' identity through expertise and owning the latest equipment:

When last I saw Adam (30, smoker), he was very proud of his latest, fourth-generation e-cigarette with wireless connectivity, and he told me that several of his friends had followed his example. (Thirlway: 108 [23])

By examining the everyday tactics of buying and using e-cigarettes in a working class community, Thirlway discovered that some smokers used the 'informal e-cigarette economy' to avoid higher prices and so resist the more middle-class lifestyle and hobbyist approaches to e-cigarette use. These working class vapers were able to cast their use as functional rather than recreational and so "demonstrate moral worth in relation to the moral problems of addiction and expenditure on the self" (p. 111).

This evidence of a thriving informal economy in Thirlway's paper indicates the importance of community-led distribution and exchange mechanisms for e-cigarettes and associated items such as e-liquids, which is unlikely to be a feature of NRT use. Aspects of Rooke et al's study [43] refute this, indicating that smokers prefer 'trustworthy' high street retailers and avoid informal retail sources. These differences may be explained in part by the recruitment methods in the two studies. Many of the participants in Rooke et al were recruited through smoking cessation groups and so may have been predisposed to e-cigarette products that followed licensed NRT in being 'official' and endorsed by reputable retailers. In contrast, Thirlway's participants were approached through general community settings and so not necessarily interested in cessation.

Gender dynamics were further evident in Thirlway's [23] study as men with serious health problems were able to enrol e-cigarette use in "local constructions of masculinity" through being a "badge of moral intent" (p. 110) to take responsibility to improve health outcomes. Despite this intent, Thirlway observed these men continuing to smoke, or at least being in possession of smoking paraphernalia, and was unsure whether their vaping went beyond a marker of moral identity to signify significant behaviour change.

In contrast to findings suggesting NCNP were too expensive [23, 45, 46], Rowa-Dewar et al [47] found one instance of e-cigarette use being described as saving money for a couple compared to smoking. Also in contrast to pessimistic findings in the papers about the embodied similarities of smoking and vaping impeding use, Rooke et al [43] and Rowa-Dewar et al [47], both found that the embodied similarities between vaping and smoking could also be a positive. For one of Rooke et al's [43] participants:

They're more satisfying. Much more satisfying. I think because, see when you take a puff, it actually feels like, you used to get that kind of hit off a cigarette when you took a puff off the cigarette, you get that sensation from the e-cig. (Female, 42, ex-smoker) (p. e62)

Further contrasting aspects within included studies were that Rooke et al and Rowa-Dewar et al found some participants to be well informed about the relative harm of vaping compared to smoking, so suggested that e-cigarettes carried a clear relative advantage and were generally healthier than smoking:

You're still smoking nicotine, but you're not smoking tar and you're not making your lungs... you're not making your lungs get covered in tar. (Male, 20, smoker) (Rooke et al: e63 [43])

Uncertain views

NCNP useful for smoking reduction but not necessarily smoking cessation. Both the e-cigarette and NRT studies reported that the products could be useful for smoking reduction but not necessarily for complete cessation:

I'd go on the patches ... and the inhaler ... Then I'd cut down slowly as much as I could. (Female, 35-44, smoker) (Atkinson et al: 5 [44])

I'm going to buy one of they new electronic fags [...] Because a few of my friends have got them, and they do work, do you know what I mean. It's like you can have a morning fag, and like a night time fag, but that helps you through the day if you're out, [...] so I'm going to get one of them. (Female, 28, smoker) (Rowa-Dewar et al: 15 [47])

There were some differences between NRT and e-cigarettes when it came to potential harm reduction beliefs. Both Rooke et al [43] and Thirlway [23] noted participants regarded NRT as more obviously a cessation aid than e-cigarettes, as vaping had connotations of recreation. This was reflected in Atkinson et al's [44] study, which found that NRT was considered a cessation aid and medicinal product. The participants in Atkinson et al were generally negative about the potential for NRT to assist in temporary abstinence in the home. They felt that anything short of complete abstinence was not effective and using NRT while still smoking was 'cheating':

Well, I wouldn't see much point in that [using NRT for temporary abstinence] to be honest if I was, if I was going to stop smoking, if I was going to use something like that I'd want to stop smoking completely, not just in the house. You know, because that way I wouldn't be cheating going outside for a cigarette. (Female, 16-24, smoker) (p. 5)

One participant in Atkinson et al's study did successfully use NRT for temporary abstinence in home, but the authors note that this was contrary to the prevailing experience of other participants. Despite these beliefs, many of the participants in Atkinson et al still indicated that they would try NRT sometime in the future. The participants in Rowa-Dewar et al's [47] study of parents who smoke were more optimistic about the potential of e-cigarettes for temporary abstinence in the home:

Handy for you to cut down, because you can use that between ... I smoke it in the house. (Female, 28, smoker) (p. 16)

NCNP alone have limited potential for smoking harm reduction. A common theme among all the studies was that NCNP would not work unless people had motivation to quit smoking in the first place. Willpower was frequently mentioned as a more important resource for quitting than NCNP to the extent that some participants dismissed the value of NCNPs altogether:

While 'patches' might be used to initially stop smoking, like many interviewees, F35 felt that without 'the willpower I don't think they're going to help you'. (Female, smoker) (Wiltshire et al: 299 [45])

I just don't see the point. If you're going to stop, use your willpower, don't use some silly electronic device. (Female, 36, smoker) (Rowa-Dewar et al: 17 [47])

E-cigarettes seen as a gateway or relapse to smoking. In Rooke et al [43] the authors collected the views of ex and current smokers and found that opinions on e-cigarettes depended on a smoker's current attitude to smoking. They found that recent ex-smokers felt e-cigarettes could be a 'slippery slope' back to smoking due to the similar embodied actions. Smokers in the study were somewhat split in their opinions of e-cigarettes. Some saw the devices as replacements for cigarettes while others felt they were undesirable and preferred to continue smoking.

Discussion

Our review has sought to go beyond summarising the reasons for higher smoking prevalence among disadvantaged groups to explore perceptions and attitudes towards NCNP. One key finding is the relative lack of sustained research exploring attitudes towards the different types of NCNP, with most papers identified in the initial stages of our review focussing on wider determinants of smoking prevalence. Of the small number of papers that focused specifically on attitudes to NCNP (i.e. those included in our study) we identified three major themes characterised by pessimistic and optimistic aspects: social, cultural and economic circumstance; relative advantage; and knowledge of relative harms. The pessimistic aspects were dominant and contributed to an overall feeling that NCNPs were useful for temporary abstinence but not cessation. For the most part, the more optimistic findings came from the e-cigarette studies. Two further themes: that NCNP were ineffective for harm reduction and cessation when used in isolation and that they may be useful for harm reduction but not cessation reflected more uncertain views of participants across the studies.

The relative dominance of pessimistic findings suggests that NCNPs are not seen as effective harm reduction/cessation products among disadvantaged groups, especially those from working class areas and smoking parents. These pessimistic attitudes appeared largely to reflect the social and cultural circumstances of participants across the nine studies. This closely mirrors the literature on smoking among disadvantaged populations, which points to how aspects of people's lives make it more difficult for them to avoid or quit smoking [24, 27, 28, 48]. The findings from this review go beyond linking smoking prevalence with stressful life circumstances, however, by highlighting that these circumstances are also not necessarily conducive to NCNP uptake. This supports recent research with smoking cessation practitioners in the UK who believe that limited income and social differences are major factors in lower uptake of e-cigarettes among disadvantaged people compared to more affluent smokers [49]. Nonetheless, some aspects of our findings suggest that e-cigarettes hold greater potential than NRT for some disadvantaged groups, including positive comments regarding use of e-cigarettes in the home in Rowa-Dewar et al's [47] study and the potential for e-cigarettes to appeal to young male smokers in Thirlway's [23] study.

The more pessimistic perspectives on NCNP compared to smoking were linked to accounts of disliking NRT's taste compared to smoking and through the embodied similarities of smoking and vaping which was perceived by some participants to maintain a 'smoking' habit or nicotine addiction and possibly lead to smoking relapse. Conversely, there was also evidence that these similarities could be viewed optimistically, as e-cigarettes could recreate existing smoking rituals and habits in ways NRT could not. Differences in smoking status may help explain this schism in opinion; recent ex-smokers in Rooke et al [43] showed more trepidation concerning e-cigarettes than young male current smokers in Thirlway's study [23], who noted the attractiveness and novelty of e-cigarette technology. Research has suggested that e-cigarettes may hold greater potential for harm reduction than NRT for reasons similar to those articulated by young men in Thirlway's study: identity formation, socialising around vaping and vaping as a hobby [50, 51]. However, the lines-of-argument from this review suggest that e-cigarettes may be used differently by those of different SES.

Beliefs concerning the relative harm of NCNPs was another common theme. There were relatively few findings in this regard for NRT, probably reflecting its longstanding role as a medically approved intervention to help smokers quit. Potential product harms were a much more common concern for e-cigarettes, consistent with their novelty and relatively recent proliferation. A simplistic interpretation of this finding might inadvertently reinforce the misconception that disadvantaged smokers are somehow less able or willing to access health knowledge than others. Yet, Smith and Anderson [29] have suggested that the continued research focus on attitudes to health among low SES groups may reproduce an assumption that low SES smokers have significantly different understanding of health than other SES groups, when in fact they are well aware of the risks associated with their health behaviours and of the role that wider determinants play in health decisions. However, recent interviews with mixed SES vapers in the UK found similar confusion over the relative harms of e-cigarettes, noting that even those who looked into the devices, while generally believing e-cigarettes to be less harmful than smoking, were still left feeling uncertain about relative harms [53]. Reflecting the findings from our review, the issue of continued nicotine addiction was chief among these concerns, a finding evident elsewhere irrespective of users' SES [54, 55].

Implications for current understandings and future research

Our review has three main implications for those working in tobacco control research, policy and practice. First, it is important to consider how the social, cultural and economic circumstances of smokers may relate to their perceptions regarding products that are less harmful than combustible tobacco but this relationship is unlikely to be simple or necessarily fixed and should therefore not be assumed. Second, these circumstances need to be complicated by a deeper examination of diversity (i.e. gender, parenthood). Thirdly, an understanding of the differential significance of smoking and vaping among diverse social groups requires attention to the embodied and sensorial experiences of smoking and NCNP use. Finally, our review highlights a lack of confidence and clarity regarding relative harm of NCNPs among smokers across the spectrum of SES.

Importantly, our review points to various avenues of future qualitative research that would enhance our understanding of how e-cigarettes and other NCNPs are being perceived and used among different social groups. We found differences in perception and use to be more complex to be explained solely by SES. Gender difference were prevalent throughout Thirlway's paper [23] and seemed to influence attitudes towards e-cigarettes as much as SES. While not so prevalent in the other papers, Rowa-Dewar et al's [47] and Atkinson et al's [44] study participants were predominantly female parents who spent much of their time at home and in caring for others, demonstrating that another key gender dimension that may prove somewhat independent of SES. Furthermore aspects of embodiment found throughout the e-cigarette studies call for reflection on the history of tobacco and nicotine advertising and feelings and experiences of stigma that this has created, and how they may impact on perceptions and use of new and novel products such as e-cigarettes [56]. Nonetheless, focus must not be removed from the experience of SES, and this review demonstrates the lack of direct qualitative research on NCNP and SES.

Strengths and Limitations

A strength of this study was that the parent search strategy was methodologically inclusive and so enabled diverse articles to be included in our original search. Some systematic reviews of qualitative literature can limit search results due to the various definitions of qualitative methodological approaches. Through application of rigorous inclusion criteria we were able to identify a lack of qualitative literature directly addressing the equity impacts of NCNP.

One limitation with the study is that we excluded articles based on title and abstract screening, if they did not include direct reference to at least one form of NCNP. Since qualitative approaches to research on smoking regularly prompt participants to talk about harm reduction and cessation, it is likely that some excluded studies did contain some findings relating to NCNP and SES. However, it is unlikely that these would have been primary findings, so their exclusion is unlikely to weaken the insights provided by this review. Another limitation is that participants throughout the studies were possibly presenting a particular version of themselves as intending to quit smoking in order to achieve approval and avoid judgement from interviewers. This was noted in Atkinson et al [44], who point out that many of the participants in the study contradicted themselves over their quitting intentions.

Conclusions

This review highlights the importance of qualitative research in public health and tobacco control. While a recent commentary on e-cigarettes and public health has called for more objective approaches to considering the potential impact of devices [57], our lines-of-argument are crucial for reminding those working in the field that people do not always make health related decisions as 'rational actors' but are influenced by a wide array of social and cultural circumstances [58].

The dominance of negative and neutral findings suggests that neither NRT nor e-cigarettes currently offer great potential for reducing smoking inequalities. Of particular significance was the largely similar attitudes to e-cigarettes and NRT evident across studies, which tempers the view that e-cigarettes have the capacity to address smoking inequalities in ways that non-combustible products have failed to do. Nonetheless, there were optimistic aspects of e-cigarette use, such as the devices replacing habits and ritual, being used expeditiously and attractive technologies, which suggest some potential for positive equity outcomes compared with NRT, provided interventions take into account local modes of use in the context of SES.

Declarations

Ethics approval and consent to participate

No ethics approval was required for this study.

Consent for publication

No consent for use of an individual's personal data was required for the publication of this study.

Availability of data and materials

Supplementary material is available for this study <link>

Competing interests

The authors declare that they have no competing interests.

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Author contributions

SH and KS conceived the study. All authors contributed to establishing the search strategy, which ML conducted. ML conducted a title screening of the 24,711 studies. Abstract screening was conducted by ML with multiple samples screened by SH and KS. All authors contributed to the refinement of the inclusion and exclusion material. Data extraction and quality appraisal were conducted initially by ML and all extracted data for the nine included studies. All authors contributing to the writing of the manuscript.

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Tables

Table 1: Synthesis stages

Stage	Process
First	In-depth repeated reading of studies.
Second	Creation of study sub-sets by NCNP type and line-by-line coding of first and second order concepts.
Third	Translation of first and second order concepts within grouped studies to create 'meta-concepts'.
Fourth	Creation of lines-of-argument informed by research questions within grouped studies.
Fifth	Translation of lines-of-argument across NCNP types.

Table 2: Included e-cigarettes studies

Study	Location	Participants	Methods	SES	Study period	Study aims
Rooke et al 2016	Central Scotland	64, smokers and recent ex-smokers, mean age 36, 33 female	Interviews and focus groups	Recruitment from socially disadvantaged areas	2013-2014	To explore the understandings and experiences of e-cigarettes among disadvantaged smokers and recent ex-smokers
Rowa-Dewar et al 2017	Five communities in Edinburgh, UK	25, mostly smokers and some ex-smokers, parents of young children, 22-47yo, 22 female	Interviews	Recruitment from socially disadvantaged areas	2013-2014	To explore the uses and perceptions of e-cigarettes by disadvantaged parents, especially in relation to temporary smoking abstinence in the home.
Thirlway 2017	North West Durham, North-East England, UK	41, 18-75yo, mean age 42, 28 men	Ethnographic observation, including field notes and interviews	Recruitment form predominantly work-class sites	2012-2015	To explore the potential of e-cigarettes to address health inequalities.

Table 3: Included NRT studies

Study	Location	Participants	Methods	SES	Study period	Study aims
Atkinson <i>et al.</i> 2013	Nottingham, UK	36, smokers, parents of young children, 16yo and over, 28 female	Interviews	Recruitment from socially disadvantaged areas	2009	To explore the uses and perception of NRT by disadvantaged parents, especially in relation to temporary smoking abstinence in the home.
Bonevski <i>et al.</i> 2011	New South Wales, Australia	32, smokers, 16yo+, 22 female	6 focus groups of 3-8	Users of community welfare services	2008-2009	Overall study aims: To explore the barriers and opportunities for smoking cessation for disadvantaged smokers.
Bryant <i>et al.</i> 2010						
Bryant <i>et al.</i> 2011						
Roddy <i>et al.</i> 2006	Nottingham, UK	39, smokers, 27-77yo, 33 male	9 Focus groups of 2-7	Local indicator of SES (Townsend score)	Unclear	To identify barriers or motivators among disadvantaged smokers to accessing smoking cessation services.
Wiltshire <i>et al.</i> 2003	Two sites in Edinburgh, UK	100 smokers, 25-40yo, 50 female	Interviews	Recruitment from socially disadvantaged areas	1999-2000	To investigate the perceptions and experiences of quitting among smokers from disadvantaged areas

Table 4: Final lines of argument synthesis

Pessimistic (more common findings)	Uncertain (more common findings)	Optimistic (less common findings)
Social, cultural and economic circumstances of low SES smokers not conducive to NCNP uptake	NCNP useful for smoking reduction but not necessarily smoking cessation + NCNP alone have limited potential for smoking harm reduction	Social, cultural and economic circumstances of low SES smokers can be conducive to NCNP uptake
NCNP do not carry enough 'relative advantage' over smoking		NCNP have some 'relative advantage' over cigarettes
Lack of clear information about relative harm of NCNP		Accepted knowledge about relative harm and NCNP
E-cigarettes seen as a gateway or relapse to smoking for recent ex-smokers		

Figures

PRISMA diagram

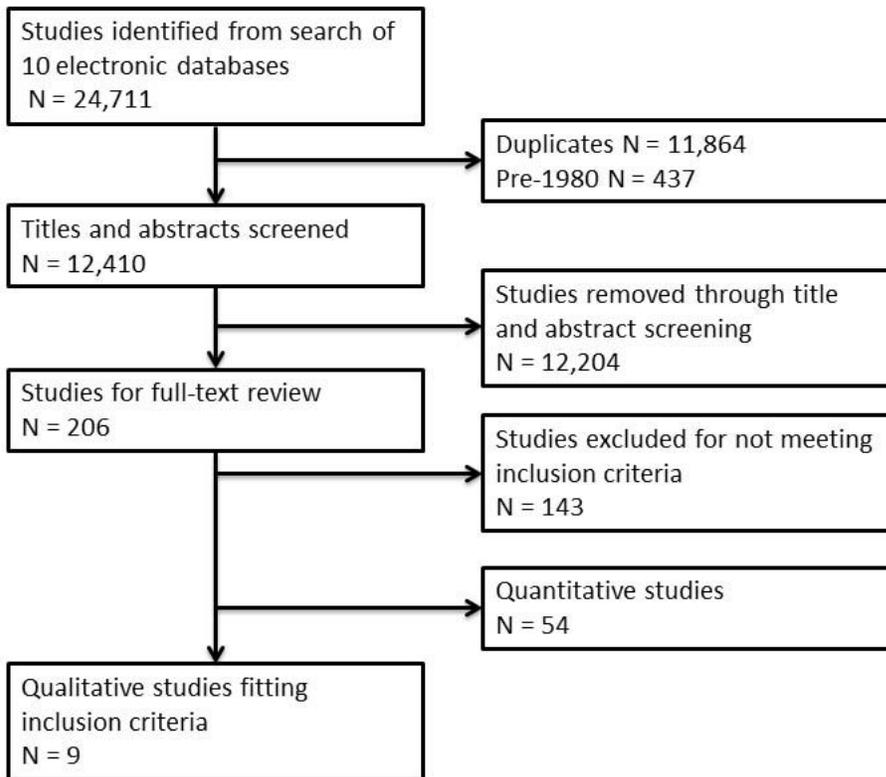


Figure 1

PRISMA flow diagram

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