Received: 7 December 2023 | Accepted: 29 May 2024

DOI: 10.1111/bjhp.12735

the british psychological society
promoting excellence in psychology

ARTICLE

Change in vaping, smoking and dual-use identities predicts quit success and cigarette usage: A prospective study of people quitting smoking with electronic cigarette support

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Funding information
Medical Research Council

Abstract

Objective: Electronic cigarettes (ECs) are an efficacious support for some but not all people wishing to stop using tobacco. While advice and practical support have been identified as increasing quit success, little research has explored the role of changes in smoking and EC-related social identities.

Methods: A prospective study following 573 people attempting to quit smoking with EC support. Self-report measures of identification with being a smoker, non-smoker, vaper and dual user (people using ECs and tobacco products) were taken prior to the quit attempt and at a 12-week follow-up.

Results: Baseline identifications with being a smoker, non-smoker or dual user were not associated with smoking outcomes. Baseline vaper identity baseline was linked to more frequent tobacco abstinence at follow-up and lower levels of cigarette smoking. Levels of social identification at follow-up were consistently linked with outcomes, with vaper identity and non-smoking identities being protective and dual user identity being related to lower abstinence rates but decreased tobacco usage. Changes in identity over time were the most consistent predictor of outcomes.

Conclusions: Findings have implications for smoking cessation practice, informing how and when identity-based interventions may be effective and our understanding of how identity transitions occur.

KEYWORDS
e-cigarette, identity, incompatibility, smoking, transition

INTRODUCTION

Social identities (aspects of the self-linked to social categories in relation to others – i.e., 'us vapers' vs. 'those smokers') shape the way people feel, think and behave (see Tajfel & Turner, 1979; Turner et al., 1987). Our social identities vary over time in terms of the categories we identify with and the extent to which we do so. While social identity processes have been studied in addiction research, little has prospectively examined the process and effects of identity transitions (the adoption of a new social identity and changes in relative identification with an existing one) or their effect on behaviour. This study addresses this issue in the context of an identity transition between being a 'smoker' and becoming a 'vaper' or 'e-cigarette user'.

Social identities and addictive/habitual behaviours

E-cigarettes (ECs) are an efficacious method for smokers to stop using tobacco (Hajek et al., 2019; Hartmann-Boyce, McRobbie, et al., 2021) and the pharmacological mechanisms are well understood (see Voos et al., 2019). However, considerable variance remains in cessation outcomes, representing an important lacuna in both our knowledge base and an opportunity to improve quit outcomes. In particular, less is known about potentially important psychosocial processes such as the operation of relevant social identities (see Frings & Albery, 2021) and little prospective research has been undertaken. This is significant as models such as the social identity model of cessation maintenance (SIMCM, Frings & Albery, 2015, 2021) and social identity model of recovery (SIMOR, Best et al., 2016) highlight social identity processes as key predictors in the initiation and maintenance of behavioural change.

Identities associated with smoking and ECs

For smokers, aspirational identities (i.e., identification with social categories to which they do *not* yet belong) and current identities are important for intended and ongoing action. For instance, smokers who also identify with being a non-smoker show increased quit intentions relative to those who do not (Meijer et al., 2015; Tombor et al., 2013; Tombor, Shahab, Brown, et al., 2015; Tombor, Shahab, Herbec, et al., 2015; Vangeli & West, 2012). In addition, stronger identification as a smoker is linked to lower quit intentions, negatively (Ahmad et al., 2019; Zhao et al., 2014) to information searching about EC (Yang & Jiang, 2021) and increased EC use (but not nicotine replacement therapy [NRT]) (Nelson et al., 2015). Models such as SIMCM argue that social identity change is a transitional process, where one identity changes and has a less dominant impact upon thoughts, feelings and behaviour, while another may do so increasingly (Dingle, Cruwys, et al., 2015). In the context of EC, Farrimond (2017) has suggested that a category of 'ambivalent' e-cigarette use is characterized by negative beliefs about ECs and vaper dis-identification. Work has also suggested that discomfort with a vaping-related social identity is associated with discontinuation of ECs (Alexis-Garsee et al., 2019). Similarly, being experimentally exposed to social information which devalued the concept of being a vaper led to lower perceived behavioural control over tobacco cigarette use (Ma & Ma, 2021). Other evidence suggests positive aspects of vaper identity as being less stigmatizing and more normative than smoking (Donaldson et al., 2021; McKeganey et al., 2018) leading to a clear sense of engagement with a vaping culture (McCausland et al., 2020). This type of evidence suggests that stronger vaping identities are likely to be prospectively linked with tobacco use cessation.

Dual users (i.e., users of both ECs and tobacco) report fewer positive expectancies (e.g, around relaxation/stimulation) and outcomes than vapers (Harrell et al., 2015), are focused on tobacco reduction rather than cessation (Adriaens et al., 2018) and are more likely to see tobacco use as less harmful when exposed to e-cigarette advertisements (Booth et al., 2019). For dual users who intend to reduce tobacco use, the definition of 'success' is different to that of people who are intending to switch fully – the former will emphasize reduced tobacco usage while the latter emphasize abstinence. From a social identity perspective, this dual use identity is interesting because it allows one to simultaneously hold compatible identifications with other categories (e.g., associated with smoking or vaping). Dual user identification is also likely to negatively affect any positive impact of vaping identities on tobacco use.

From the above it can be argued that some identities are likely to be protective (against cigarette use, e.g. non-smoking and vaping identities) while others may not be (i.e. smoking and dual-use identities).

While work supports the role of EC-related identity in successful tobacco discontinuation or reduction, it is also limited to the extent that changes in identity are not measured over time. Nor has work examined whether identification at different points (i.e., pre/post use transition) is more or less predictive of smoking behaviour.

Aims and hypotheses

This review suggests that among those transitioning (fully or partially) between cigarettes and ECs, (i) some will have greater/lesser social identity as a vaper and (ii) changes in such identification will be linked with differing outcomes. These patterns may be less prevalent (or reversed) for dual user identification to the extent that they may partly, but not fully, realize the benefits of e-cigarette identities (i.e., stigmatization, harm reduction, etc.).

This study tested the impact of initial and developing levels of identification (with social categories associated with smoking and vaping) on smoking outcomes by measuring pre- and post-levels of identity among people who transitioned from exclusive tobacco smoking to full/partial EC use. We hypothesized that stronger levels of endorsement of protective identities (being a non-smoker or vaper) both pre-and post-transition would be positively related to tobacco abstinence at follow-up and reduced tobacco usage among those whose quit attempts were not successful. Increases in identification with these categories should also be linked to these outcomes. Conversely, high levels of identification with smoking orientated identities (being a smoker or dual user) should be linked with lower levels of smoking cessation, but, among dual users that do not quit, lower levels of daily cigarette consumption.

METHODS

Transparency and openness

This study was part of a larger project which used a MOST (multiphase optimization strategy, see Collins et al., 2007) approach to test the efficacy of five different stop smoking support interventions. These aimed to assist smokers to quit smoking using e-cigarettes and included provision of an EC device and a variety of tailored advice and support interventions (i.e. device selection, text message support, etc.), see (Kimber et al., 2020).[1] Measures were taken before the participants were provided with the EC to support a smoking behaviour change/quit attempt and at a 12-week follow-up point. The

[1]Analyses showed no significant main effect of any of the interventions employed in the main study on identity change measures (see Kimber et al., 2020 for more details), so these factors were collapsed for the purpose of the current study, and sensitivity analyses undertaken controlling for their effects.

main project protocol (Kimber et al., 2020) details this study and the main study findings can be found in Kimber et al. (2023), which also details how bots and duplicate responses were handled (see supplement 3 to the Kimber et al., 2023 paper for more details). We report all data manipulations and exclusions. The analysis reported below was not pre-registered.

Design

A prospective design with two time points – baseline (pre-transition, prior to transitioning from exclusive tobacco use) and a 12-week post-transition follow-up. Transition was defined as the study enrolment date. Measured variables included in the current study comprised levels of identification with smoking/EC related identities, quit status and last 7 days smoking prevalence.

Ethics

The study received ethical oversight from London South Bank's University Ethics Panel, ethics reference number ETH2021-0148.

Participants

Participants were aged 18 or over, daily smokers, UK resident, fluent in English, interested in quitting, interested in using ECs, currently had access to a mobile (cell) phone and were able to make an online purchase. Participants were excluded if they were unable or unwilling to be contacted after 3 months, were daily EC users, or were affiliated with the tobacco or e-cigarette industries. A sample of 1214 completed baseline measures (after the removal of 241 duplicates/bots) and 563 responded to follow-up and are included in the current analysis. The mean age was 40.85 years (SD = 12.87). 65.5% of the sample defined themselves as female, 33.9% male, .4% non-binary/self-described, 0.2% preferred not to say. 97.5% of the sample defined themselves as White. Respondents smoked on average 17.78 (SD = 8.33) cigarettes a day. Participants were recruited between April and October 2020.

Materials

Identities

Identification as a *Smoker*, *Non-smoker*, *Vaper* and *Dual-user* were measured at each timepoint with a single item for each identity – 'I identify with [group]' (see Postmes et al., 2013). Baseline items were recorded on a 5-Likert point scale (Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), Strongly agree (5)). For dual users, the question provided a definition of the category (*I identify as a dual user* (i.e. *e-cigarette user and smoker*)). Due to a technical error, at 12-week follow-up items were measured on a 7-Likert point scale (Strongly disagree (1), Disagree (2), Somewhat disagree (3), Neither agree nor disagree (4), Somewhat agree (5), Agree (6), Strongly agree (7)). To account for differences in scale anchors when calculating change scores, we standardized scores at each time point by calculating z scores. Change scores were then calculated by subtracting the pre-transition standardized scores from the post-transition standardized scores (leading to higher scores indicating an increase in smoker/non-smoker/vaper/dual user identity between pre and post points).

Quit status

The item 'In the last 4 weeks, have you smoked any cigarettes or tobacco at all (even a single puff)?' was used to measure smoking abstinence at follow-up.

Smoking in the last 7 days

The item 'How many cigarettes/roll-ups have you smoked in the last 7 days?' was used to measure smoking over the preceding 7-day period among all participants at baseline and those who reported having a single puff or more at follow-up.

Motivation to stop smoking

The motivation to stop smoking (MTSS, Hummel et al., 2017) was used at baseline, comprising a single item, 'Which of the following describes you best?' Response options were: *I don't want to stop smoking* (1), *I think I should stop smoking but don't really want to* (2), *I want to stop smoking but haven't thought about when* (3), *I REALLY want to stop smoking but I don't know when I will* (4), *I want to stop smoking and hope to soon* (5), *I REALLY want to stop smoking and intend to in the next 3 month* (6) and *I REALLY want to stop smoking and intend to in the next month* (7).

Overall analytical strategy

Using binary logistic regressions, correlations and linear regression we tested how baseline and follow-up identities related to (i) tobacco abstinence and (ii) cigarette smoking. We then used the binary and linear regression approaches to examine changes between baseline and follow-up in strength of each social identity linked to these same outcomes. Cases where required data were missing were not included in relevant analyses. The specific models tested are detailed case by case in the results. For data and syntax (to recreate analysis in full), please see London South Bank University Open Research (https://openresearch.lsbu.ac.uk/).

RESULTS

Which identities matter?

Predictors of successful tobacco abstinence at follow-up

To explore the relationship between each identity and abstinence we conducted two binary logistic regressions with abstinence at follow-up as the criterion variable. The first (prospective) model ($n = 526$) included each pre-transition identity as predictors (prospective analysis) and the second ($n = 451$) each post-transition identity (cross-sectional analysis). This approach was selected in preference to including predictors from both timepoints in a single model as this would measure the relationship between identity change (which would be represented by unique variance in post identities if pre-levels were included in the same model). Such change effects are explored in the identity change analyses discussed below. Where confidence intervals are reported (in square brackets), they indicate a 95% confidence interval. Reported *B*s are unstandardized, unless otherwise indicated.

For pre identities the model correctly classified 58.6% of the cases and the model was not significant (Nagelkerke $R^2 = .09$, χ^2 (4) = 3.37, $p = .49$).

For post identities, the model correctly classified 90.0% of cases and the model was a significant fit, Nagelkerke $R^2 = .77$, χ^2 (4) = 385.00, $p < .001$. Higher levels of identity as a non-smoker (OR = 1.46, [1.19, 1.78], $p < .001$) and as a vaper (OR = 1.37, [1.12, 1.69], $p = .002$), were linked to greater odds of abstinence. In contrast, reduced odds of abstinence were linked to identities as a smoker (OR = .61, [.48, .78], $p < .001$) and a dual user (OR = .49, [.39, .62], $p < .001$).

A sensitivity analysis including participants' age, gender, years smoking, baseline smoking (cigarettes per day over 7 days), motivation to stop smoking and the presence/absence of each intervention as additional predictor variables was also conducted. Identities had the same pattern of results and significance as predictors in the above models. No covariates were significant.

Relationships with number of cigarettes smoked in last 7-days at follow-up

To explore which baseline identities were important in relation to predicting the number of cigarettes smoked over last 7 days at follow-up, we conducted a series of zero-order correlations between each identity and this outcome (excluding people who had abstinence at follow-up). Pre-transition identities were not significantly linked to this outcome (although a trend was apparent), while post-transition identities were consistently, with identity as a smoker, linked to higher levels of cigarettes smoked and identity with being a vaper, dual user and non-smoker all linked to lower cigarette smoking (see Table 1).

Another sensitivity analysis using a partial correlation approach (i.e. including the control variables as partials) again revealed the same pattern of results and significance for the relationships between post-transition identities and outcomes. For pre-transition identities an additional negative correlation between baseline vaper identification and number of cigarettes smoked emerged.

Which identity changes are most important?

Predictors of abstinence at the follow-up

To test which change in identity predicted successful abstinence, a binary logistic regression was undertaken, with each identity change score included as predictors, alongside age, gender, length of smoking, motivation to stop smoking, interventions and baseline levels of each identity.

The overall model ($n = 421$) correctly classified 91.4% of cases and was a statistically significant fit (Nagelkerke $R^2 = .83$, χ^2 (4) = 384.68, $p < .001$). Successful abstinence was associated with a greater increase in non-smoker (OR = 2.62, [1.57,4.37], $p < .001$) and vaper identity (OR = 2.44, [1.48, 4.04], $p < .001$). In contrast, abstinence was also negatively related to increases in smoker (OR = .26, [.13, .52]) and dual user (OR = .16, [.09, .30], $p < .001$) identity. In terms of the covariates, tailored advice on flavour was a significant predictor in the model (OR = 3.09, [1.31, 7.28], $p = .01$, advice linked to higher quit rates), a pattern also observed with receiving text message support (OR = 2.40 [1.01, 5.70], $p = .48$). Gender was statistically significant (OR = .21 [.08, .56], $p = .002$, women having lower abstinence rates). Baseline identity as a smoker (OR = .19 [.08, .46], $p < .001$) and dual user (OR = .17 [.08, .37], $p < .001$) were linked with lower quit rates, while baseline rates of vaper identity (OR = 2.39, [1.10, 5.21], $p = .028$) and non-smoker identity (OR = 2.70 [1.34,5.44], $p = .005$) were linked with higher quit rates. Other factors were not statistically significant predictors. See Kimber et al. (2020, 2023) for details of the interventions and for more details on intervention effects on smoking cessation.

Predictors of cigarette use

To test unique variance in last 7 days smoking associated with each identity change, a regression was undertaken with each identity change as predictors, alongside the interventions, age, gender, length

TABLE 1 Zero-order correlations between the level of identification with each social category, at each timepoint (pre/post transition).

	M (SD)	Pre-smoker	Pre-vaper	Pre non-smoker	Pre dual user	Post-smoker	Post-vaper	Post-non-smoker	Post-dual user
Cigarettes smoked last 7 days (Follow-up)	39.52 (39.13)	.11 [.001, .22]**	**−.16 [−.26, −.06]**	−.08 [−.20, .06]	−.05 [−.18, .07]	**.39 [.26, .50]**	**−.48 [−.59, −.35]**	**−.31 [−.42, −.18]**	**−.28 [−.42, −.12]**
Pre smoker	4.54 (.79)	–	**−.21 [−.40, −.07]**	**−.23 [−.47, −.09]**	**−.17 [−.33, −.04]**	**.20 [.07, .32]**	−.02 [−.17, .12]	**−.21 [−.38, −.05]**	< −.01 [−.15, .17]
Pre-vaper	1.74 (.92)		–	**.51 [.28, .68]**	**.51 [.35, .67]**	−.14 [−.25, −.01]*	**.24 [.12, .36]**	**.29 [.11, .46]**	**.14 [.04, .25]**
Pre-non-smoker	1.33 (.73)			–	**.30 [.13, .47]**	**−.16 [−.30, −.02]**	.13 [−.03, .26]	**.44 [.25, .61]**	< .01 [−.12, .10]
Pre-dual user	1.98 (1.11)				–	−.06 [−.20 .08]	**.19 [.06, .32]**	**.23 [.07, .40]**	**.15 [.02, .28]**
Post-smoker	3.28 (2.00)					–	**−.30 [−.44, −.12]**	**−.34 [−.47, −.20]**	.02 [−.20, .14]
Post-vaper	4.86 (1.85)						–	**.31 [.17, .42]**	**.37 [.19, .53]**
Post-non-smoker	3.31 (2.12)							–	−.06 [−.19, .08]
Post-dual user	3.26 (2.05)								–

Note: 95% confidence intervals in parentheses, coefficients in bold indicate $p < .05$.

*$p = .052$; **$p = .055$.

of time smoking, motivation for change and baseline levels of each identity (as above). The model was significant, R^2 (adj) = .38, $F(18, 182) = 7.94$, $p < .001$. Increases in dual user identity over time was linked to decreased cigarettes smoked per day at follow-up ($B = -8.77$, $t = 2.83$, $p = .005$, increase linked to lower consumption), and the same pattern was observed among vaping identity increases ($B = -12.84$, $t = 4.35$, $p < .001$) and non-smoker increases ($B = -13.10$, $t = 2.54$, $p = .012$). Increases in smoker identity were related to increases in cigarettes per day ($B = 12.81$, $t = 3.84$, $p < .001$). The written advice intervention was a significant predictor ($B = -11.19$, $t = 2.43$, $p = .016$, advice linked to lower consumption), as was baseline smoking ($B = .15$, $t = 3.52$, $p < .001$, higher baseline smoking related to higher consumption).

DISCUSSION

ECs are an increasingly common tool used by smokers wishing to stop using tobacco products and appear efficacious (Hajek et al., 2019). However, the evolution and smoking related impacts of associated social identities are not understood. The current study hypothesized that levels of identity associated with quitting (being a vaper and a non-smoker) would be linked with later abstinence (and, for those who did not maintain a quit attempt, a greater reduction in smoking), while identification with being a smoker would be linked to the opposite. For dual users, we predicted lower smoking cessation rates being linked to higher dual user identification, but also the possibility of higher identification being linked with decreased daily smoking rates for those that did not quit smoking. We also predicted that greater increases in identities would be linked to the same outcome profiles.

The findings of the study suggest that, prior to quitting, identification with being a smoker, non-smoker or dual user had no association with later abstinence or cigarette smoking levels. Identification with being a vaper, however, was linked to a decrease in the number of cigarettes smoked at the follow-up. This was not in line with study predictions that baseline levels of identity would consistently be critical predictors of later success.

In contrast, in line with our hypotheses, absolute levels of identification at the follow-up point were consistently associated with abstinence (favourably in the case of identification with being a vaper and non-smoker and unfavourably in the case of identifying as a smoker or dual-user). Smoking identification at this point was linked to greater cigarette smoking, while others, including having a strong dual user identification, was linked to a reduction (similar to Nelson et al., 2015).

In terms of changes in levels of identification over time, increases in vaper and non-smoker identification were linked with positive outcomes (both abstinence and fewer cigarettes smoked at follow-up). Increasing dual user identification was linked to lower odds of being abstinent at follow-up, but a reduced number of cigarette smoked at that time. Increases in smoker identification were linked with decreased abstinence and increased usage.

Implications for smoking cessation

While ECs have been shown to be a successful quit aid, there are also a number of additional strategies which can be put in place to support quit efforts. These include behavioural support (Hajek et al., 2019; Hartmann-Boyce, Livingstone-Banks, et al., 2021) and technical support and advice specifically around e-cigarette use which is often offered in vape shops (Ward et al., 2018). The current study suggests that another form of support may be generated by helping people identify with being a vaper and strengthening ex-smoker identification. This could potentially be achieved with prospective quitters through a structured discussion of what these categories consist of and how individuals see themselves in relation to them now and in the future. More experientially, from the perspective of SIMCM and SIMOR, developing social connections with people in such groups will also increase the likelihood of developing the relevant identities (see Frings & Albery, 2021). In line with this, previous work has highlighted the

benefits of non-smoking identities (i.e. Meijer et al., 2015; Tombor et al., 2013; Tombor, Shahab, Brown, et al., 2015; Vangeli et al., 2010).

The current work may go further, suggesting that dis-identification with smoking identities could also be beneficial. Importantly, it also implies that while preparatory therapeutic work may lay the groundwork for identity change, it is the change itself and later levels of the identities which show the strongest relationship with positive outcomes. This suggests ongoing support which has elements of identity work (i.e. supporting the construction or maintenance or protective behaviours through dialogue, perhaps incorporated in approaches such as motivational interviewing; Rollnick et al., 2010) may be efficacious. From a public health perspective, other work has also highlighted that interventions which depress smoking identity reduce smoking behaviour. For instance, public health messaging may challenge the legitimacy of valued identities such as being a parent with smoking (via dangers of passive smoking in children). Identity informed messaging has shown positive initial results (see Moran & Sussman, 2014). Highlighting such incompatibilities may well directly create identity dissonance which changes behaviour (Frings et al., 2024). Similarly, decline of cigarette brand identity (i.e. via policy interventions which depress levels of advertising, packaging images, etc.) has been linked with less smoking behaviours (Webb et al., 2017).

A second important implication surrounds the identification of participants as a dual user of both cigarettes and ECs. The current work suggests this identity is linked with reduced cigarette smoking frequency, with higher levels of dual user identity being linked to greater decreases in smoking. Perhaps then, from a harm reduction perspective, such identities should be encouraged if (and only if) full cessation is not seen as achievable – noting that a complete switch to e-cigarettes should be a primary aim.

Implications for theory

The current findings reiterate the importance of identity in addiction and provide further support for perspectives which highlight the importance of identities associated with reduced use or abstinence. It also introduces the potential of identities *between* these positions. This may be important not only in smoking, but also in areas such as controlled use (i.e. 'mindful drinkers') or interventions such as opiate replacement therapy. The current research suggests such intermediate identifications may be a helpful stepping stone and not automatically related to relapse risk (a position contrary to that often held by abstinence only approaches). The findings also reinforce the dynamic nature of identities over time.

The current study has a number of limitations. The follow-up period (12 weeks) is relatively short. Although relapse rates are highest in the early weeks and months of quitting, they remain high subsequently, with a significant relapse rate remaining 1 or more years post quit (Hawkins et al., 2010). It is an open question if those with stronger protective identities are more likely to support continued long term quit maintenance (see Vangeli & West, 2012). However, models such as SIMCM and SIMOR both provide conceptual reasons EC identities should be protective in the longer term and these concepts have been empirically supported in various domains (e.g. Buckingham et al., 2013; Dingle, Stark, et al., 2015; Frings et al., 2016; Hertel et al., 2019; Meijer et al., 2015; Wolff et al., 2015). Also, while the current study demonstrates the prospective influences of identity, identity change measures are by definition more cross-sectional, which limits assumptions about the nature and direction of causation. The sample size is also modest for some analyses (i.e., tobacco use analysis among smokers who did not quit completely) and smoking was self-reported rather than chemically verified.

The sample selection and composition also merit consideration. The sample was relatively young in age, were not heavy smokers on average, wanted to quit using an EC and predominantly white and female. While it is possible (or perhaps likely) that identity transitions may follow different trajectories with different sample profiles, we would argue that this does not detract from the generalizability of the finding that identity is an important predictor. It does, however, highlight the need to look at the interactions between identities (i.e. between being female and being a smoker), as previous research suggests that (in)compatibilities between social identities can be an important influence in initiating addictive

behaviour change (Frings et al., 2024). This caveat also applies to smokers who may occasionally, in the present or past, have used EC, in contrast to those naïve to the devices.

Related to the above, the selection criteria required that participants were prepared to quit using EC. This (and the inclusion of dual users) arguably led to a sample of participants who were more than average prepared to adopt a 'vaping'-related identity. Different outcomes may be found in a more general population. However, we note the range and variation in vaping identity suggests not all participants readily adopted the vaping identity. This point also raises interesting questions about the role of health narratives and perceptions which may make vaping more or less attractive as an activity. This will evolve in line with both the emerging evidence base on the long-term effects of ECs, but also due to cultural and policy messaging. If EC use becomes stigmatized, it is likely the protective elements of the identity will also be depressed. Finally, the sample was of moderate smokers and different relationships between identity and outcomes may be observed among heavier smokers (although where smoking cessation is controlled for in other studies, the patterns of identity remain the same, e.g. Buckingham et al., 2013).

In conclusion, this paper suggests that identity transitions between being a smoker and a vaper, dual user and non-smoker are all important in terms of predicting later relapse. Nurturing protective identities may be an effective way of supporting long term quit success and 'in between' identities (i.e., dual user), may be an important stepping stone in complete tobacco use cessation. Findings also suggest that the identity transitions journey that someone quitting takes, both in terms of the degree of change and the final identity position, are the key predictors of outcomes.

AUTHOR CONTRIBUTIONS

D. Frings: Conceptualization; funding acquisition; formal analysis; project administration; writing – original draft; writing – review and editing. **I. P. Albery:** Conceptualization; formal analysis; writing – review and editing. **C. Kimber:** Data curation; project administration; writing – review and editing. **F. Naughton:** Conceptualization; funding acquisition; formal analysis; writing – review and editing. **V. Sideropoulos:** Data curation; project administration; writing – review and editing; software. **L. Dawkins:** Conceptualization; funding acquisition; data curation; project administration; methodology; supervision; writing – review and editing.

ACKNOWLEDGEMENTS

The authors would like to extent their gratitude to Ms Danielle Marr for her assistance in the implementation of this project.

FUNDING INFORMATION

This study was funded by the Medical Research Council] (MRC/PHIND; Grant ref:MR/T002352/1).

CONFLICT OF INTEREST STATEMENT

DJF IA VS CK disclose no conflicts of interests. LD has provided consultancy for the pharmaceutical company, Johnson & Johnson.

DATA AVAILABILITY STATEMENT

Data are available via London South Bank University Open Research (https://openresearch.lsbu.ac.uk/). The analysis was not pre-registered.

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How to cite this article: Frings, D., Albery, I. P., Kimber, C., Naughton, F., Sideropoulos, V., & Dawkins, L. (2024). Change in vaping, smoking and dual-use identities predicts quit success and cigarette usage: A prospective study of people quitting smoking with electronic cigarette support. *British Journal of Health Psychology*, *00*, 1–12. https://doi.org/10.1111/bjhp.12735